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DANCING WITH DISORDER: DESIGN, DISCOURSE, DISASTER

Edited by:

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...and all **student assistants**

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European Academy of Design

The 7th Conference of the European Academy of Design took place on 13-15 April 2007 in Izmir, Turkey and was organised by Izmir University of Economics, Faculty of Fine Arts and Design. The context for the conference, the people involved and the themes are summarised below.

The European Academy of Design (EAD) was formed in 1994 by a group of leading academics from around Europe to promote the publication and dissemination of research in design through conferences hosted by different educational institutions in Europe. EAD has also undertaken the publication of proceedings, newsletters and a journal, to improve European-wide research collaboration and dissemination. Although the word European sounds limiting, it has in face gone beyond the boundaries of Europe and contributors from all around the world have always been welcome. For instance, at the Izmir Conference, 12% of the speakers were from outside of Europe. This suits the aims of the EAD well, which are to encourage discussion across traditional boundaries between practice and theory, and between disciplines defined by working media, materials and areas of application.

The Academy is headed by a committee of acknowledged academics from across Europe, as well as from the United States and Australia. The Academy has organised six international conferences organized every two years since 1995. The conferences previous to 2007, their locations, organisers and themes are listed below:

1995 Salford, University of Salford (Rachel Cooper) UK: Design Interfaces
1997 Stockholm, University of Stockholm (Elisabeth Svengren) Sweden: Contextual Design
1999 Sheffield, Sheffield Hallam University, (Mike Press) UK: Design Cultures
2001 Aveiro, University of Averio, (Vasco Branco) Portugal: Desire - Designum - Design
2003 Barcelona, University of Barcelona (Anna Calvera) Spain: Techné: Design Wisdom
2005 Bremen, University of Bremen (Wolfgang Jonas) Germany: Design - System – Evolution

The Conference Theme

Three thematic components of this design conference – disaster, discourse and disorder – indicate three interrelated but relatively autonomous fields that highlight various aspects related to contemporary issues in design. As one of the most ambitious design faculties in the country, the organising team in Izmir decided to choose an equally ambitious title for the conference. 'Dancing with Disorder: Design, Discourse, Disaster'. The team particularly like the dances of the 'capital' Ds in the title, but the selection was not accidental. Although no one never wishes it to happen, there are signs that human beings will face different kind of disasters in this century varying from terrorist attacks to global warming, from tsunamis to scarcity of water. We as designers have a duty, amongst others, to contribute to the prevention of disasters when possible, to alleviate any pain and to repair the damage.

Definitions of design, a well-known and studied concept, include such terms as "plan," "purpose," "intention" and "function," in addition to others such as "artistry" and "creativity" that take central importance in the definition of art. Plan, purpose, intention and function are concepts related to predictability and hence systematic thinking. Systematic thinking in turn is related to order. Design brings order to the relationship between us and the objects that we use, see and perceive.

Design discourse involves the current language of design, i.e., the terms with which we conceptualise and talk about design. Design management, design research and current issues in design are some of the specific topics that can be addressed within this framework. This area of the conference included presentations that sought to go beyond the over-asked question of 'what is design?' and advocate a re-appraisal of accepted design conventions. The role/position of design was particularly scrutinized from the viewpoint of design research, design and everyday life, images and representation, new materials and methods, and design management.

Order, on the other hand, suggests a straightening out so as to eliminate confusion. The function of design then, is to eliminate disorder, i.e., confusion, chaos, unpredictability. All of this is based on a binary thinking which privileges purpose over idleness, function over dysfunction and order over disorder. Order is a desirable attribute, the failure of which ends up in disaster. But how are order and disorder defined at first place; by whom; on what basis; and in whose interests? What is the price that is paid in order to establish order and who pays for it? Is order a historical concept having acquired different meanings in different contexts? If so, what is the order of today's world, bodies, objects? Is it one or many or have we lost our sense of existence based on plan, predictability and order? What is the meaning and role of design in relationship to changing notions of order? All these questions are historical as well as universal to examine crucial relations at any given time.

What can design do for physical and mental disorders: Dysfunctional bodies, schizophrenia and hysteria. How can design contribute to the end of social disorders, unrest, upheavals, wars, vandalism, crime, domestic violence and so on. How can design counteract virtual disorders: viruses, hacking, fake identities, deceptive information and information pollution.... Disaster is related to order because disaster may be defined as the breaking down of order. Presentations that were included in this theme addressed specific contexts when notions of order, control, social hierarchy and unity are rendered irrelevant. Like order, the identification of disaster may too be dependent on context. What counts as disaster for a particular culture, group or society may be regarded as victory for another. Also, disaster may be seen as a precondition for the birth of novelty, especially in the field of design. Hence the questions range from "what counts as disaster in design?" to "what is the place of design in a world of disasters?" The relationship between discourse, disaster, disorder and design calls for multi-disciplinary approaches and can be addressed from a variety of diverse theoretical perspectives such as science, metaphysics, phenomenology, post-structuralism, feminist and psychoanalytical theories, anthropology, evolutionary approaches, management, etc.

Papers in this volume address contemporary or historical situations from clearly stated research experiences. Naturally, they do not respond to all of the questions raised above, but illustrate a convincing list of variety that design has much to contribute to this process – one of the reasons why we are publishing this book.

Prof. Dr. Tevfik BALCIOGLU



Dean, Faculty of Fine Arts and Design
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KEYNOTE SPEAKERS



Elif AKARLILAR
'Designing Maviterrenean'

Elif Akarlılar (1969) studied at the University of Vienna and received her post-graduate degree in International Politics. She then joined International Human Rights seminars at Strasbourg University. As she worked for Mavi New York offices she completed her masters degree in the New York University in the Costume History field.

In 1991, Elif Akarlilar started to work for her family company in the foundation process of Mavi Jeans brand. Since 1999 she has been working as the Global Brand Manager at the Istanbul and New York offices of Mavi Jeans. She acts as the creative head of the brand by managing the design teams in Istanbul and NY as well as the marketing and visual merchandisng teams. Her longtime collaboration with Adriano Goldschmied, known as the gold hand of jeans design, and her other projects including Rıfat Özbek for Mavi, Maviology magazine, Martin Parr's 'Style Hunting in Istanbul' Photo-book, Organic Denim and Istanbul T-shirts all bear her signature.



Ayşe BİRSEL
'My Disorderly Mind'

Designer, Birsel + Seck

Ayşe Birsel grew up in Izmir, Turkey. In 1989 she received a Fulbright Scholarship to complete her Master's Degree at Pratt Institute, Brooklyn, NY.

Recipient of the 2001 Young Designer Award from the Brooklyn Museum of Art, Birsel was a finalist at the Cooper Hewitt National Design Awards in 2002. She was named a Fellow at the International Design Conference at Aspen, and has taught at Pratt Institute. Her work is in the permanent collections of Cooper Hewitt National Design Museum and the Museum of Modern Art. In 2002, a collaboration with Bibi Seck led to the creation of their studio Birsel + Seck. Fueled by curiosity, disrespect for existing solutions and a love for drawing as a way to think, they have designed products for Herman Miller, Hewlett Packard, HBF, Merati, Target and Acme. Their work was included in the National Design Triennial 2006.

KEYNOTE SPEAKERS



Clive DILNOT

'Dancing with Disorder: Design and the Overcoming of Disaster'

Clive Dilnot is currently Professor of Design Studies at New School University, New York where he teaches both design and in the University Humanities program. Previously, he was Professor of Design Studies and Director of Design Initiatives at the School of the Art Institute of Chicago. He has also taught at Harvard University, in Hong Kong and in Britain, and has been a visiting Professor at the University of Technology, Sydney, the University of Illinois in Chicago and Rhode Island School of Design. Dilnot has lectured, given keynote addresses and acted as visiting critic at universities and conferences world-wide. He has written extensively on design history and theory. Recent publications include Ethics? Design? (Chicago, 2005) and a forthcoming study on design research. Outside of design, he has written on aesthetics and art theory photography (Pirelli Work, Steidl, 2006) on the decorative arts; on museums and their framing of objects and on architecture and architectural theory. He has served on the advisory board of The Journal of Design History and is now on the advisory boards of the journals Visual Communication, Design Research Quarterly, and ThRAD (Portugal).



Gert DUMBAR

'Breakfast, lunch, dinner and disaster pictograms'

Gert Dumbar (1940) studied painting and graphic design at the Royal Academy of Fine Arts in The Hague. He studied in the post graduate graphic design program at the Royal College of Art in London. In 1977 he established Studio Dumbar, where he has completed numerous extensive corporate identity programs for many major national and international clients including: the Dutch Postal and Telecom Services (PTT), the ANWB (Dutch Automobile Association), the Dutch Railways, the Dutch Police, the Danish Post (together with Kontrapunkt a/s, Danmark) and the Czech Telecom. Studio Dumbar won numerous national and international design awards. Among these were two D&AD golden pencils, a prize that has never been won twice by any other graphis designer in the world. Since 2003 Dumbar has been teaching at the Royal Academy of Fine Arts in The Hague. In addition to this he frequently lectures at art schools and international design conferences. Between 2000 and 2002 Dumbar was visiting professor at the Royal College of Art in London. From 1985 until 1987 he was visiting professor there as well and headed the graphic design department. Since 1980 he has periodically taught and lectured at the University at Bandung, Indonesia. From 1996 until 1998 he was visiting professor at the Hochschule der Bildenden Künste Saar in Saarbrücken, Germany. From 1998 until 2002 he was a board member at DesignLabor in Bremerhaven, Germany. Dumbar has been the chairman of the Dutch association of Graphic Designers (BNO). In 1987/1988 he was the president of British Designers and Art Directors Association and was a member of the Designboard of the British Rail Company until 1994. Gert Dumbar is a member of the Alliance Graphique International (AGI). In 1990 the Humberside Polytechnic honoured him as Honorary Fellow. In 1994 the Asociacion de Disenadores Grafáficos de Buenos Aires (ADG) appointed Dumbar to be a Honourary Member and in 1995 the English Southampton Institute honoured Dumbar with the title of Honourary Doctor in Design. Dumbar is the initiator of the travelling exhibition 'Behind the Seen' about the work of Studio Dumbar, which has been shown in the Netherlands, Germany, Japan, the USA, China, Australia, Canada and The Hague in 2006.

"I WANT DISORDER -- GET IT?": THE PARADOXICAL REPRESENTATIONS IN CONTEMPORARY ARCHITECTURAL NARRATIVES

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Abstract:

Underneath outwardly exhibited randomness and disorder in contemporary architecture today, there is a tendency towards greater organization for its representation. And this tension—between order and disorder—provides much of the narrative power of contemporary architecture. The seemingly chance encounters of surfaces, materials, or forms - which are generally judged to be negative – are today seen as immensely exciting. And yet, behind this seemingly disordered outlook, which demands the attention of the viewer, there is an enormous organization without which it would be impossible to build such designs in reality. To demonstrate paradoxical representations in contemporary architecture this paper turns to a Simpsons episode which features Frank Gehry as the guest architect who builds a concert hall in Springfield. This paper argues that playfulness, hollow virtuosity, and mystery are some of the conditions driving the language of contemporary architecture - but largely neglected in the current discourse. Exemplified by the scenes in the episode, the recent work of Frank O. Gehry will be studied for how it encourages, even impels, these conditions.

Frank Gehry : ...And none of this would happen if it weren't for a letter written by a little girl.
Marge Simpson : I wrote that letter.
Frank Gehry : You wrote "You are the bestest architect in the world"?
Marge Simpson : Well aren't you?
(Simpsons, Season 16, Episode 14)

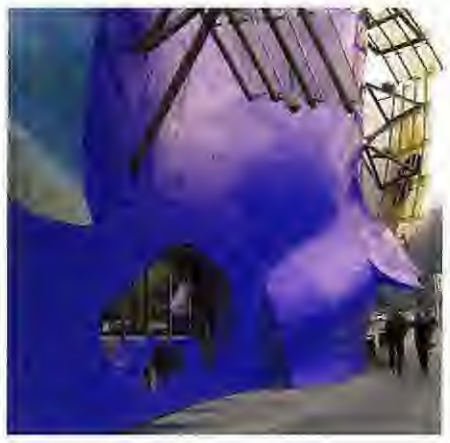


Figure 1

Underneath outwardly exhibited randomness and disorder in contemporary architecture today, there is a tendency towards greater organization for its representation. And this tension—between order and disorder—provides much of the narrative power of contemporary architecture. The seemingly chance encounters of surfaces, materials, or forms - which are generally judged to be negative – are today seen as immensely exciting. And yet, behind this seemingly disordered outlook, which demands the attention of the viewer, there is an enormous organization without which it would be impossible to build such designs in reality.

To accentuate my concern with the paradoxical representations in contemporary architecture, I would like to draw attention to the Simpsons, the most favorite animated family in the world. In the fourteenth episode of The Simpsons' sixteenth

season (first aired on April 3, 2005 in the US), Frank O. Gehry is featured as a guest star. As the first architect to appear in a Simpson's episode, Gehry voiced the part and played himself. Let me narrate the episode briefly:

The Simpson family visits the neighbouring town of Shelbyville, the citizens of Shelbyville call Springfield's residents 'stupid hicks. ' This makes Marge very angry and when they return, Marge, as the Chairman of the Springfield Cultural Activities Board, proposes that the town builds a new concert hall so that Springfield would be seen as a cultured and refined place. And to upgrade Springfield's image she suggests Frank Gehry as the architect of course. We then see Gehry checking his mails in front of his house in Santa Monica, LA. He receives Marge's letter, asking him to design a concert hall in Springfield.



Figure 2

Although he is especially impressed by the Snoopy stationary, he denies her request, crumples up the letter and throws it away on the sidewalk. But when he sees the paper's rumpled shape, he calls out: "Frank Gehry, you are a genius!" The crumpled paper transforms into a model for a new $30 million concert hall and Gehry then presents his design at the Springfield Town Hall. The town approves and the construction starts. First we see a regular, orthogonal steel system construction, and then cranes start swinging wrecking balls to knock and beat the structure into shape literally. Gehry gives his thumbs-up once the final form is achieved. However, the opening night of the Concert Hall was a disaster because apparently no one in Springfield but Marge likes classic music. And the building turns into a ruin soon. The town sells the building to Montgomery Burns who decides to turn it into a state prison.



Figure 3

It might be dubious to pick up the Simpsons to discuss Gehry's architecture. However, I believe, it can be particularly effective for illustrating the problems in contemporary architecture in a comedic narrative. Without argument one can assert that Gehry's architecture is known worldwide, and he is one of the few contemporary architects with little interest in theorizing his work. Needless to say, his work has been controversial. In many ways, his work speaks for the present problematic state of architecture and it deserves serious examination.



Figure 4

Gehry in Springfield

Let's start with how Gehry shows up the first time in the Simpsons episode. At the Cultural Activities Board Marge mumbles desperately: "Think Marge think. Culture... vulture... birds of pray... pray in a church... the father, son, and Holy Ghost... ghosts are scary... scary rhymes with gary... that's it, architect Frank Gehry!" And she tries to convince the board

members by showing Gehry's Los Angeles Concert Hall seen on the cover of Concert Hall Weekly where it says: "So Good It's Gehry!" Marge convinces the committee to fund a new concert hall, designed by Frank Gehry. So far it is strangely familiar, as all the architect audience here would know, Simpsons illustrates 'the Bilbao effect', a phenomenon entered into contemporary language of architectural discourses after Gehry's Guggenheim Museum in Bilbao, Spain. The museum changed Bilbao, the former industrial city in economic decline, into one of the most popular destinations in Europe; virtually overnight. The Simpsons episode highlights the municipalities' attempts to get a Bilbao-esque architectural wonder in their cities to draw in visitors. Here, the city is Springfield; the architect is, of course, Frank Gehry.

Here comes the new concept of 'Starchitect' or 'Stararchitect', although giving celebrity status to architects is nothing new since Renaissance. However, since the popular success of the Guggenheim Museum in Bilbao, the media started to talk about the so-called 'Bilbao effect' and a star architect designing a prestige building was thought to be the solution to produce a landmark for the city. I would like to cut short this discussion of starchitect, and 'Bilbao effect' in an attempt not to reiterate what is known in current architectural narratives. And yet, it is clearly seen that the Simpsons episode offers a relevant architectural commentary of the last decade, touching on issues like 'starchitect', and 'Bilbao effect'.

I am a genius!

Returning to the episode, we see how Frank Gehry gets his inspiration from a crumpled-up letter on the sidewalk. We should not forget that it is a highly satirical parody. And yet, it depicts his empirical design method, which famously begins at the very low-tech level of crumpled paper models and assemblages of found objects. Playfulness has been particular apparent in Gehry's oeuvre since the 70s. The consequences of this formal playfulness can best be observed, in the transformation of the architectural design process into a kind of game. Anthony Vidler (1992, p.102) explained the dilemma of the notion of play in its resemblance to Alice's playing croquet with the Queen of Hearts in *Alice in Wonderland*: 'She knew what the game was called, but there did not seem to be any fixed rule and to complicate matters the equipment was in continuous and random movement. From the flamingo-mallets to the hedge-hog-balls and the soldier hoops, everything was open to chance, deprived of the security of the articulated moves and their known consequences'. Similarly, in Gehry's game, there seems to be no apparent rule. The formal implications of a design process informed by the aesthetic of playfulness are also demonstrated in Springfield Concert Hall, as in other Gehry buildings.

The "bestest" architect in the world!

The impact of technology on architecture is not new and I have no intention of examining these issues in this paper. What I want to stress briefly, though, is the duality between construction and appearance, a crucial theme for today's architectural narratives. This duality can also been detected in the Simpsons' episode. Kolorevic (2005, p.117) asserted that, 'in the new digitally-driven processes of production, design and construction are no longer separate realms but are, instead fluidly amalgamated.' In the episode we see Gehry at the construction site with his helmet on. Cranes start swinging wrecking balls to knock and beat the structure into the shape of a typical Gehry building. He gives his thumbs-up once the final form is achieved. It does not look like a digitally driven but a crane driven process, design and construction are done at the same time, amalgamated in a satirical way. It looks also as if it is very easy to build the Springfield Concert Hall. And later when the building turns into ruins, the mayor asks the town, 'Why did you tell that you did not like classical music?' They reply: 'we did not have time, everything happened so quickly.' This dialog is a parody of what happened in the construction of the Concert Hall in Los Angeles, which took 15 years to finish the construction.

Mr. Burns' budget

Looking at Gehry's architecture, what one sees is the display of extravaganza, impetuousness, and technological virtuosity. But, there is another thing that exists behind the glossy surface, the *unlimited budget* of the client. This raises a number of critical issues. Perhaps the most obvious of these is that signature architecture requires rich clients who are able to afford it, such as Lillian Disney, the widow of Walt Disney, or Paul Allen, the co-founder of Microsoft, or the Guggenheim family, to mention only a few. Similarly, rich clients seem to prefer Gehry's work, as

they are able to represent their wealth through his architecture. In Walt Disney Concert Hall, for instance, when the 50 million dollars of Lillian Disney were not enough for completing the construction, the contribution of the donors saved the life of the building (Architectural Record, 1995, p.23). The donor names were etched onto floors and walls in letters proportionate in size to the amount they gave. The most generous donors had their names given to the parts of the building: hence, the Eli Broad auditorium, the Henri Mancini family stairway, and so forth.

The Simpsons episode has a critical commentary on this issue as well. When the building turns into a ruin, the town sells the building to Mr. Burns, the fictional character on the Simpsons. He is the owner of the Springfield Nuclear Power Plant and Homer Simpson's boss. Mr. Burns is Springfield's richest and most powerful citizen, with an estimated net worth of $16.8 billion USD (Montgomery Burns, wikipedia). He uses his power and wealth to routinely do whatever he wants. This time Mr. Burns has the power to buy the Gehry design-bankrupt Concert Hall and turn it into a federal prison.

"Ha, ha! No Frank Gehry-designed prison can hold me!"

Simpsons offer the biggest tragedy that has happened in a Gehry building: 30 million dollar Springfield Concert Hall ends up being converted into a prison. Here we see another paradox. With a little effort, a concert hall can be turned into a prison. Is it not a known fact that Gehry's projects are all extremely similar in their sculptural language of curvilinear forms? From the Guggenheim Museum Bilbao to the Walt Disney Concert Hall, the EMP, the Richard B. Fisher Center for Performing Arts at Bard College and the Ray and Maria Strata Center at MIT, they are generally undifferentiated given the program, cultural context or existing site context.

There is no intention to discuss Gehry's complete work in this paper. Instead it is intended to focus on some of the conditions driving the language of contemporary architecture. Gehry's architecture finds its realization in its exploitation of the latest technological advances. No argument can be made against this. He takes pleasure in displaying the technological capabilities of contemporary architecture thus leaving the spectator in a state of wonder at the skill and technical mastery that lies behind its construction.



Figure 5

Here I want to introduce the idea of virtuosity for its own sake as another theme important for Gehry's recent architecture. What seems to be neglected in the contemporary discussions of architecture, however, is that a certain *display* of technical virtuosity – *virtuosity for its own sake* – is taken for granted. It is apparent that a certain principle of technological virtuosity is essential to the realization of Gehry's architecture. This pursuit of *virtuosity* for its own sake culminates in Gehry's architecture with an intention to leave the spectator in a state of wonder at the skill and technical mastery that lies behind its construction. Gehry depends on playful virtuosity to send the visitor out of the building grinning with delight.



Figure 6

"Frank Gehry, you like curvilinear forms much?"

Speaking of rich clients, I want to give another building as example: the Experience Music Project (EMP) in Seattle, Washington (1995-2000), the ideal building for Gehry to test his ideas. A representative of the triumph of technology,

Microsoft cofounder Paul Allen acted as client with deep pockets for the EMP project. The private funding for this publicly accessible project meant the citizens of Seattle had no authority to be involved or influence on the design of the EMP (unlike Springfielders). Gehry's freedom is evident when looking at the plan of the EMP. Lacking any of the traditional Gehry back of house budget-meeting boxes to which forms are draped; the EMP plan appears organic in nature. With the exception of "Sky Church", the remaining five programmatic volumes have seemingly chance encounters of surfaces, materials, or forms.



Figure 7

Behind this seemingly disordered outlook, there is an enormous organization without which it would be impossible to build such designs in reality. Gehry adopted a number of various advanced technologies to facilitate the construction of the EMP. The most important tool being the CATIA (Computer Aided Three-dimensional Interactive Application) software used to model the building three-dimensionally. As an adaptation from aerospace industry, this software has the ability to flatten complex multiple-curved surfaces which can then be used as a template to cut them into pieces. At EMP the flattened shapes of exterior panel cladding were cut using CAD/CAM and CNC (Computer Aided Drafting/Computer Aided Manufacturing, Computer Numerically Controlled) milling machines one by one and bending them back into their shape before mounting them in place on the building using GPS location devices and a highly customized mounting system which allows for adjustment (Linn, 2000, p. 175). One peculiar aspect in this construction process needs to be mentioned is the employment of custom-made elements, which represents an important change in the logic of building production. The use of custom-made pieces is one of the elements that makes Gehry's architecture unique, but at the same time makes it troubling. No two panels are similar out of the roughly four thousand panels covering the EMP exterior. Although the process of creating templates and cutting the shapes was highly automated by way of CATIA, these complex shapes had to be hand bent into their final shape and hand-assembled to include the necessary structural supportive metal fin framing. Each panel holds about seven shingles each of which has a unique shape and size. Each shingle is tailored to fit exactly in its designed location and each panel is woven together in situ. As a result, the building's surface looks like a *patchwork fabric*.

The notion of patchwork fabric, I have just introduced, can be further studied considering a specific set of buildings. From the EMP, to the Jay Pritzker Pavilion in Millennium Park in Chicago (2004) (here I can add Springfield Concert Hall project too), there is an apparent change in the surface treatment. The enveloping surface wrapping around the building, as in Bilbao, became continually (but unexpectedly) interrupted or broken in Gehry's later projects such as the Millennium Park pavilion. This frayed characteristic of the building's surface reveals the thinness of the surface, thus exposing the artificiality of his gesture.



Figure 8

The consequence of this series of interruptions on the metal surface is "the frayed and torn drapery," demanding the attention of the viewer and aspiring to the status of an autonomous sculptural object. Here, I would like to draw attention to the pattern of the draped surface. As

Leatherbarrow and Mostafavi (2002, p.198) asserted, 'the patchwork of panels that makes up its surface is composed of pieces that have been cut from the same cloth, giving the building's novel geometries great regularity and cohesion.' This is evident in almost all of the buildings built after the EMP. Despite of their apparent formlessness, the pattern of their cladding appears to be cohesive and repetitive. Given the materiality and weight of the building, rendering such a surface is not an easy task. Nonetheless, it becomes a vehicle for displaying technological virtuosity, spectacle, and mystery, through which Gehry earns his appearance in the Simpsons.

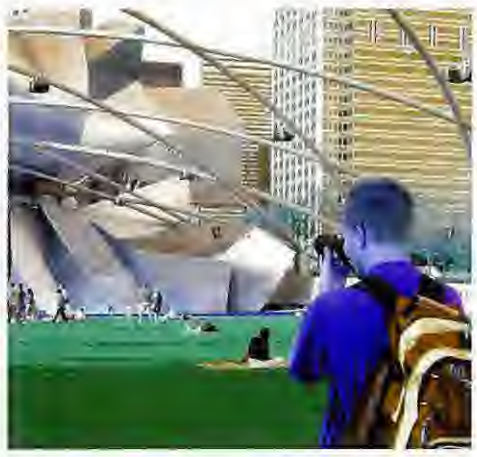


Figure 9

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ON THE RELEVANCE OF BLIND-VARIATION-AND-SELECTIVE-RETENTION IN CREATIVE ARCHITECTURAL PROBLEM SOLVING WITHIN THE CONTEXT OF ARCHITECTURAL EDUCATION

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Abstract

Blind-variation-and-selective-retention process is essential for all genuine gains and achievements in epistemic activities such as thinking, learning, and general problem solving. This idea is fundamental to the conception of "creativity" and "creative thought" in "evolutionary epistemology," and should be equally applicable to the epistemic activities concerning "creativity" and "creative thought" such as architectural problem solving. Taking this argument as its basis, the present study examines and discusses the relevancy and applicability of blind-variation-and-selective-retention as a model for architectural problem solving, particularly within the context of architectural education. It underlines particular characteristics of the model that should be considered prior to its adoption to architecture which these characteristics also point to lines of research which should be considered in depth.

Introduction

The present paper is based on the idea that blind-variation-and-selective-retention process is essential for all genuine gains or achievements in epistemic activities such as thinking, learning, and general problem solving. (See Campbell 1960) This idea is fundamental to the conception of "creative thought" in "evolutionary epistemology," particularly in the works of Karl Popper and Donald Campbell and should be equally applicable to the epistemic activities concerning "creativity" and "creative thought" such as architectural problem solving.[1] The main aim of the present study is to examine and discuss the relevancy of blind-variation-and-selective-retention process as a model[2] for creative architectural problem solving within the context of architectural education. Its main thesis is that we can expand this model for the (re)conception of problem solving and "creative thought" or "creativity" in architecture, with some reconsiderations and modifications. Consequently the model will be profitable for architectural design education, for teaching/learning how to design and for gaining architectural knowledge.

The nature of blind-variation-and-selective-retention process

Blind-variation-and-selective-retention process in problem solving is fundamentally based on trial-and-error with an "evolutionary" argument. The process has following essentials (See Campbell 1960, 1974):

[1] The present paper is based on the hypothesis that architectural design can be evaluated as a "type of" problem solving activity in the sense that it is a purpose driven or teleological process where acts of making, evaluation and remaking take place towards the creation of a work that potentially fulfils the objectives, or provide a solution to the stated architectural problem. The activity has an "epistemic" nature since it concerns and requires utilization and production of various levels and types of knowledge. However this does not amount to architectural design equals to problem solving or reduction of architectural design to a mere knowledge activity. These uses are for convenience, for isolation and foregrounding certain aspects of a very complex activity such as design that helps the paper to clarify the main problem, set its main argument and discuss the relevancy of it.

[2] The use of the term "model" refers to "a simplified description of a complex entity."

1. "a mechanism for introducing variation," namely a series of –blind- trials which attempt to make a forward move which potentially carry the process from one stage to another, towards the solution.

2. a "consistent" intentional "selection process" which eliminates the unsuccessful trials while keeping the successful ones.

3. "a mechanism" for preserving the successful-so-far variations, and a "mechanism" for transferring them to the next series of trials.

The process has an evolutionary argument in the following accounts: trials are more or less accidental or blind gambits, varied from the previous successful-so-far moves. Each gambit is controlled by a selection mechanism, which eliminates erroneous or unsuccessful moves, while leaving the successful ones to continue the search process.

Blind-variation-and-selective-retention process in architectural problem solving

The architectural adaptation of the model is based on the following main assumptions: In architectural problem solving, like all other problem solving processes, a blind-variation-and-selective-retention process is fundamental to all "genuine" and "creative" achievements. This intrinsically implies that in creative architectural problem solving, making always comes before selection and modification. Any shortcut bypassing this process, such as adoption of an initial solution-in-principle, schemas, or use of patterns, is dependent upon already existing knowledge or wisdom gained earlier by blind-variation-and-selective-retention –in a great extent- from earlier solutions. This viewpoint also implies that architectural problem solving activity is actually embedded in the world of architectural works and architectural problems. In this sense, these arguments also apply to adaptation of earlier knowledge or wisdom to the new conditions which –also- requires more or less blind-variation-and-selective-retention process.[3]

However, at first sight, blind-variation-and-selective-retention model of architectural problem solving seems to be contrasting with the conventional view(s) of problem solving in two accounts. Dwelling on these widely accepted issues may help us to clarify the model and adopt it to architecture.

First, it is often argued that some sort of already achieved knowledge and wisdom reduces the frequency of blind search, or trial-and-error is not random or blind at all (See Campbell 1960, Simon 1969, Akın 1986, Newell et' al 1958). For example in the *Sciences of the Artificial*, Herbert Simon (1969) argues that existence of previous knowledge or experience gained from "similar" or earlier problems affects the frequency of "trial and error" in the problem solving activity to the degree that it can be "altogether eliminated." Similarly, Newell et' al (1958) argue that "trial-and-error attempts take place in some 'space' of possible solutions." Trials are controlled by some type of strategy that makes the progress "meaningful." A strategy "either permits the search to be limited to a smaller sub-space, or generates elements of the space in an order that makes probable the discovery of one of the solutions early in the process." (Newell et al. 1958) It is true that previous knowledge and wisdom provides a basis to begin with and proceed, and it provides shortcuts in creative search in various stages and levels. In fact this is required, since no problem solving starts from a *tabula rasa*. But "knowledge" cannot altogether eliminate the "blind" search since what is creative and new is what is –yet- unknown to us. If we reformulate, "creativity" means going beyond what was already known and achieved, therefore it should be blind. Knowledge of earlier solutions is essential to architectural problem solving, but even the use of earlier forms for the conception of new ones is not about basic repetition or imitation but requires interpretative/creative modification prior to their application to new conditions

[3] Architectural problem solving activity can be evaluated as "evolutionary" and "epistemic" in two accounts: first, the activity is evolutionary since each work is somehow tied to tradition, earlier solutions, problems, and earlier body of knowledge. However, this type of "evolutionary" continuity is relatively more open to shifts, ruptures and discontinuities, and the "evolutionary" link might no be clear and observable at all. Second, the problem solving "process" itself is "evolutionary" since every new stage is successor of earlier stages and a modified or transformed version of them. This type of "evolutionary" continuity is generally not concern shifts and ruptures, and the "evolutionary" line is more clear or observable.

which also requires a type of blind-variation-and-selective-retention process.

Simon (1969) further argues that problem solving activity "involves much trial and error," and "the more difficult and novel the problem, the greater is likely to be the amount of trial and error required to find a solution." However, "at the same time, the trial and error is not completely random or blind," as it was in biological evolution, but "...it is in fact, rather highly selective." (Simon 1969) He states that "the new expressions that are obtained by transforming given ones are examined to see whether they represent progress toward the goal. Indications of progress spur further search in the same direction; lack of progress signals the abandonment of a line of search." (Simon 1969) This might mean even if we do not possess any prior knowledge or experience related with the current problem situation, we can still determine the course of our search towards a goal: "problem solving requires selective trial and error." (Simon 1969) However, drawing a "search" direction is also a trial, and precedes our evaluation of whether the line was progressive or not if it was not based on an earlier wisdom of some type. In addition, a currently progressive line does not guarantee that that it will remain so, or it will yield a successful solution, respectively a currently regressive line may turn into a progressive one if pursued further, and may lead to a successful solution. It is obvious that architectural problem solving is not a random but a goal driven, intentional activity. But the source of intentionality does not lie in the "making," or in the "trials," but in the "selection" process. In other words, in architectural problem solving, goals are not totally attained through foresightful moves, but also by blind "trials," and the selection of unsuccessful trials followed by bearing on to explore the best-so-far trial lines. So we may reformulate the argument as follows: creative problem solving requires knowledge of earlier solutions and wisdom to start with and proceed, but at the same time it involves a blind trial, and selective error elimination, or more specifically, blind-variation-and-selective-retention process.

Second account that seems to be conflicting with the idea of blind-variation-and-selective-retention is that architectural problem solving is purpose-oriented and teleological.[4] The main purpose of the architectural problem solving activity is to construct a work that will –potentially- provide a solution to the formulated problem. Typically, an architectural problem is stated in the form of a brief or a program. A popular view of architectural design, which was perhaps descendant from the functionalist doctrine in architecture, proposes that the program is the only legitimate and neutral source and origin of the form, an asset which directly implies, governs the formalization process and the solution: Form or the solution is something postulated as the purpose or posited at the expense of function or program. This view of architectural problem solving is problematic at least in two accounts: first, the program can neither be objective nor comprehensive. There will always be preconceptions and prejudices playing an active role in the preparation of a program, and for this reason, the program will always be selective and biased. (See Rowe 1996) Second, even if such a program exists, there is no algorithm, and no method that can guarantee a program to be directly translated into a meaningful form or solution. This problem was perhaps best stated by John Summerson (1957) as follows: "The conceptions which arise from a preoccupation with the programme have got, at some point, to crystallize into a final form and by the time the architect reaches that point he has to bring to his conception a weight of judgment, a sense of authority and conviction which clinches the whole design, causes the impending relationships to close into a visually comprehensible whole." But he confesses that there

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[4] We may distinguish at least two main types of teleological achievements which an architectural problem solving activity might concern: first is intrinsic to the activity or the process itself and actually embedded in it. It concerns construction or design of an architectural work that should provide a –potential- solution to an architectural problem which was stated in the program or the brief. In this sense "program" or purpose is an element which actively plays a constructive or formative role in the process. Second resides beyond the process and the work. It concerns for example an intended change in the environment through architecture; better living conditions, a livable city, more accessible environment and buildings, etc. In this case, the control between the work and the intended modification or change is not direct and clear. The model proposed here particularly concerns the first category. However, an architectural work can still be considered as a "device" that has the potential and responsibility to make a change in the environment, which can be interpreted as a "trial."

is a "hiatus:" "there is no common theoretical agreement as to what happens or should happen at that point" of crystallization. (Summerson 1957) It is true that program is a fundamental "constructive" or "formalizing" element in architectural problem solving, but the problem is that it is often misplaced in its widely accepted conception(s). Program or purpose neither implies the solution nor prescribes the formalization of the solution, but only good for selection and judgment: Any teleological achievement in architectural problem solving is not attained –fully- through direct formalization process, based on the program, plan, aim, purpose or something else similar, but through blind-variation-and-selective-retention, or more architecturally, through making, selection by criticism, and remaking. Program or aim is not good for directly "forming" the solution but only for "selection" and through the selection process for guiding the course of "search" and consequently determining the "solution."

In a final analysis, conventional views of problem solving are compatible with blind-variation-and-selective-retention in these two seemingly-contradicting accounts. They rather seem to focus and foreground certain aspects of creative problem solving which are already contained by the proposed model.

To sum up and reformulate, architectural adaptation of the proposed model has three essential points:

First, creative problem solving in architecture, as in other problem solving processes, requires knowledge of earlier solutions and wisdom to start with and proceed, but at the same time it involves a blind trial, and selective error elimination, or more specifically, blind-variation-and-selective-retention process. We may adopt this process to architecture as follows: creative problem solving in architecture calls for a process of making, critical selection (or selection by criticism), and remaking.

Second, knowledge of earlier solutions is essential in architectural problem solving, but the use of earlier forms for the conception of new ones is not about basic repetition or imitation but requires an in depth understanding and interpretative/creative transformation prior to their application to new conditions which also requires a blind-variation-and-selective-retention process. Since the solution already exists, the process of understanding can be interpreted as more of a hypothetical (re)construction.

Third, any teleological or purpose-oriented achievement in architectural problem solving is not attained –fully- through direct formalization process which is prescribed in the purpose, program or problem formulation, but through making and selection by criticism, or by blind-variation-and-selective-retention process.

Conclusion: Things to (re)consider

If blind-variation-and-selective-retention model will be adopted and employed for architectural problem solving, particularly within the context of architectural education, various essentials must be (re)considered. These essentials also point to various research lines or fields that should be studied in detail.

1. There must be methods and strategies and also tools for the analysis and understanding of the existing works of architecture for gaining already existing knowledge and wisdom as the basis for creative investigation. In architectural problem solving, reliance on tradition is inevitable: one must start where his or her predecessors left. This has the primary importance for the students of architecture since they barely possess the required background knowledge to start with, and proceed the search process.

2. Variation-creation is essential to the proposed model. However, creation of many variations or parallel exploration lines seems to be contradicting the conventional making habits of architectural problem solving. Still it seems to be a viable approach particularly for education, but needs further investigation.

3. Combined with the previous, there is also a need for methods and strategies and also tools for making and variation-creation process. Existence of methods and strategies -although they still do not guarantee the success- is what makes the difference between "blind" search and "random" search. Tools help methods and strategies work or even make them available to this process.

4. Creation of many variations or parallel exploration lines seems to be harder and more complex than the conventional making habits seeming o follow a single line. It seems that computer software is a viable and powerful tool to be used for this purpose if they were once (re)considered and (re)designed particularly to support this process. They can further provide seamless control on the "evolutionary" process. (See Anay 200S)

5. There is a need for experimentation and free play: the point is; an unblocked forward movement is essential for "creativity." This must not be confused with "free expression," or a similar unmediated making activity. Any forward movement should depart from the existing wisdom, or should be based on the criticism of what already existed, and should be controlled by rigorous selection through criticism.

6. Combined with the previous, there is a need for rigorous selection processes. In architecture this is generally tied to problem formulation, program and contextual forces. It is worth to restate that neither of these or similar assets imply or prescribe the solution. Critical selection (and retention) is the only way for reaching teleological achievements in architectural problem solving.

7. There is a need for methods, mechanisms and tools enabling the continuity of the evolutionary process, for preserving the successful-so-far solutions, and informing the next generation of variations. It must be noted that this is relevant for both within the unique problem solving process; from one stage to another, or without it; between the present architectural problem solving process and the problems and the solutions preceding it.

Finally, it must be underlined that previous arguments also (re)locate the tradition (or the body of earlier knowledge) and the program (or architecture's utopian or teleological component) within the architectural problem solving process. This structure differs from most "accepted" approaches, but essential, and must be considered as such prior to its application in any area including education.

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COMPUTER AIDED DESIGN (CAD) AND COMPUTER AIDED MANUFACTURING (CAM) IN THE JEWELLERY SECTOR IN TURKEY

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Abstract

The jewellery sector in Turkey, which is the second most jewel exporting country in the world after Italy, gained dynamism by the use of computer aided design (CAD) programs. While previously the molds and the models were made in a small quantity by the craftsmen in the workshops around Grand Bazaar, now more designers have begun to work in this sector by using CAD programs such as Jewelcad, Rhino and Matrix. Now designers not only design the models and leave the production process to the craftsmen, they also draw the mold designs by using CAD programs.

Jewellery sector has become a more innovative one by CAD and computer aided manufacturing (CAM) systems. Especially by designing much more models and molds, production gained a huge speed and the decrease in costs caused an increase in exportation. Besides, designs that have perfect finishes are produced by using CAD programs and CAM systems.

This paper includes the process of jewel production by using CAD and the stages of CAM. Also there will be some examples of many jewels which were produced by CAD/CAM systems.

CAD/CAM and the Sectors It Is Used

CAD/CAM is defined as "a computer system used in engineering, combining design techniques and manufacturing principles, as in the creation of complex wiring diagrams and the design of coordinated machine parts" (Webster Dictionary, 1995). Computer Aided Design (CAD) was referred to a technique which employs the computer in the design process in order to increase the efficiency of the designer. By use of computer in design, labor and time reduce which are attributing towards producing a safer and a better design (Kim et al., 2002).

CAD is a wide range of computer-based tools that assist design professionals in their design activities. In CAD, the use of computer could be very effective during the task of reproducing the drawings or drawing alternatives. For that reason, some people re-defined CAD as "Computer Aided Drafting". Computer Aided Design and Drafting (CADD) are used for differentiating it from the traditional definition of CAD (Onwubiko, 1989).

Computer-aided manufacturing (CAM) is "in relation with the product lifecycle management computer-based software tools that assist engineers, in the manufacture of product components" (Wikipedia, 2006). By the help of CAD, the products firstly modeled in computer and then the data converted to generate CNC code to drive numerical controlled machine tools. Usually the CAD operator exports the data in one of the common data formats, such as IGES or STL, that are supported by a wide variety of softwares (Wikipedia, 2006). In jewellery sector the CAD-CAM programs especially use the .STL file format, for this reason operators exchange their drawings to this format.

The first CAD systems were developed in MIT in 1963 by Ivan Sutherland and his professor Stephen Coons. They improved

the Sketchpad which allowed the designer to interact with computer graphically. The design was fed into the computer by drawing on a monitor with a light pen (Kaftanoğlu, 2006).

The first applications of CAD were in automotive, aerospace industries and in electronics. Also the first applications of CAM were in automotive and aerospace industries such as UNISURF in 1971 at Renault (Bezier) for car body design and tooling (Wikipedia, 2006).

Today CAD is used in many sectors such as;

- Industrial Design (Automotive, Fashion, Jewellery, etc.)
- Building Engineering
- Civil Engineering
- Mechanical Engineering (Automotive, Aerospace, Consumer Goods, Machinery, Ship Building etc.)
- Many other organizations where designers and engineers work together.

The Jewellery Sector in Turkey

Istanbul is the core area of gold jewellery production in Turkey. These firms were all close to Grand Bazaar, but in recent years these firms moved in a new region called *Kuyumcukent* in Istanbul. However, production in Ankara and Izmir is also extensive. Jewellery making is a traditional work for Turkish people; therefore, the handcraftsmanship in Turkey is better then the other countries. There are still small workshops and craftsmen that are producing handmade jewellery in Diyarbakır, Mardin and Trabzon. Filigree (telkâri) -made in Mardin- and golden wickerwork bracelets -made in Trabzon- are some of unique arts used in handmade jewellery.

Filigree or telkâri, as it is called in Anatolia, is a jewel work, which is made with twisted threads of gold or silver (Figure 1). In this art, metal is curled, twisted and plated and then united from their endpoints with each other (Filigree, 2007). Before making filigree, the silver is melted first and then poured into a mold to make thin rods. Then, these thin rods are drawn to wires which are 1 millimeter in diameter. First the frame is made with 2 millimeter thick wire to attach the motifs, and then the motifs are welded to the frame with silver and borax mixture. Making filigree jewellery is a very hard work; for this reason, they are only made by talented craftsmen.



Figure 1. (Wind of Anatolia, 2007)

On the other hand, golden wickerwork bracelets - which are made of tiny golden or silver wires - are woven by hand at homes by young girls (Figure 2). Firstly gold or pure silver is melted and then they formed into sticks. These sticks are then drawn to 0.3 millimeters; thus, silver or gold wires are obtained. Then they are given to the weaver ladies. There is no machine involved at any stage of this art. But it takes too many hours; such a bracelet could be weaved in 12 days.

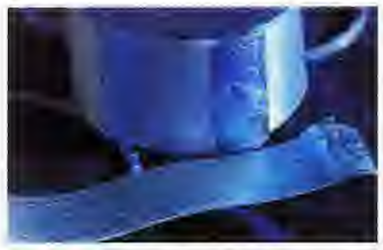


Figure 2. (Trabzon Culture and Tourism, 2007)

In gold jewellery production, Turkey ranks among the top-five countries in the world. It has the total capacity to produce 400 tons of gold and 200 tons of silver annually. For this reason, Turkey is pointed out as a rival to Italy in this field by world jewellery authorities.

The gold jewellery sector of Turkey has turned its attention to exporting its products in recent years. Jewellery produced by an intense accumulation of information and technology and ornate concept of design has been exported to a total of 130 countries. In 2004, the US occupied the first place in our

jewellery exports, -by order of exportation ratios- the other countries are; The United Arab Emirates, Switzerland, Germany, Russian Federation, Italy, Libya and Israel (IMMIB, 2006).

Moreover, there are some foundations that are supporting the jewellery production and exportation in Turkey. Istanbul Chamber of Jewellery is making researches for companies about the new countries for exporting trade or promoting companies to attend the exhibitions in different countries to introduce the Turkish jewellery companies and their products (Karbeyaz, 2005).

Turkish companies are attending international exhibitions such as "Vicenza" in Italy and national exhibitions such as "Gold & Silver Expo Made in Turkey" in Istanbul. In these exhibitions, the companies advertise themselves with catalogues and their products.

Another organization for jewellery is Istanbul Precious Minerals and Jewellery Exporters' Association which was founded in July 2003. Basic aims of Istanbul Precious Minerals and Jewellery Exporters' Association can be summarized as:

- To increase exports,
- To provide better promotion of the sector in the international domain,
- To organize the professional relations and activities of exporters,
- To find solutions to all types of problems,
- To guide the export activities of member firms (IMMIB, 2006).

Use of CAD-CAM in Jewellery Sector

As it is mentioned before, there are a lot of companies that are producing jewellery in Turkey. Also there are workshops where craftsmen make handmade jewels. A craftsman could make a piece of jewellery in 2 ways. He could make it by hand using many types of equipment to form the metal (Figure 3).

The second way doesn't take a shorter time with respect to the first way, because the craftsmen make the same operations with wax. He makes the model with wax and then have this cast in metal.



Figure 3. (Buccellati, 2000)

Today there is another way for making jewellery. By using CAD/CAM, this process doesn't take a long time. The model of any complex design could be made in a day with its drawing and wax model. By using a computer program that is written for jewellery production, the designer or a CAD operator could draw the design's mold in a few hours. It also depends on the intricacy of the design.

After the design's mold which is modeled by computer, the CAD data are converted to another file format which is compatible with the manufacturing machine's CAM system. In jewellery sector, especially a special type of machine is used which prints wax from its "jets" just like in an inkjet printer. This machine prints wax to build up the form of wax jewellery. By the help of CAD/CAM the operator could calculate how many hours this process would take. In Turkey, designers involve all these processes of jewellery making. They could design jewellery and then model its mold in computer. After modeling, designers exchange the data to the format that is used in the manufacturing machine. For this reason, the designer could control every details of the jewellery. S/he could also calculate the weight of the jewellery so that s/he could change some parts of the model to make it a little bit weightless. The other advantage of the CAD/CAM approach is that the designer could render the model (Figure 4) to show the customer how the final piece will look like before producing the cast.



Figure 4. (Author's Collection)

The Process of Jewellery Production

Design software is the most important thing during the process of making jewellery by computer. There are lots of programs that allow modeling products, but in jewellery sector more detailed programs should be used. For this reason some special programs were written for jewellery. These softwares are;

- Artcam Jewelsmith,
- 3Design Jewel,
- Freeform,
- Jewelcad,
- Jewelspace 3,
- Matrix 3D Jewellery Design Software Version,
- Solidworks,
- Rhinoceros.

In Turkey especially Jewelcad, Matrix, Rhinoceros and Freeform are used. The operator using Jewelcad, begin drawing by lines and design all surfaces as a solid model. The program also allows the designer to see every sides of the design on the monitor. Figure 5 shows the interface of Jewelcad program.



Figure 5. (Author's Collection)

Rhino (Figure 6) and Matrix (Figure 7) are other softwares. These programs are especially used for taking photorealistic images of the jewellery. Maybe the most important advantage of using such programs is that the operator could show the clients the rendering before beginning production. So the client could imagine what s/he would buy. Furthermore, a web site of the company or the catalogue of the products could be prepared by using these images. Contrary to these programs, Jewelcad's rendering (Figure 8) is not as good as these software programs.



Figure 6. (Rhinoceros, 2007)



Figure 7. (Gemvision, 2007)



Figure 8. (Author's Collection)

In addition, in Rhino the operator could see the four sides of the design while drawing, and the most important advantage of Rhino with respect to Jewelcad is that the user could also write the command to the command line at the top as it is in Autocad. On the other hand, the disadvantage is that the user should draw all the jewellery components such as gem stones before drawing a model. But in Jewelcad there are many kinds of gem stones in every shape and cut in the software's database.

Freeform is another program which is very different from the other ones. In this program the operator should work like a sculptor. Another feature of this software is that the operator

doesn't draw by lines as in other programs but hew the solid form so as to give shape. Operator uses equipment for hewing which is working by touching sense. (Figure 9). Artistic designs could be made by this program.



Figure 9. (CADEM, 2007)

After drawing the model in the computer, the next step is converting the design format into another format that a CAM program can read. The .STL format is mostly used for files. Modelworks (Figure 10) is a program that converts the jcad file format to the .STL format. With the help of this program, it can be calculated how many hours does it take to complete the model before beginning to produce the mold, the process status of the wax model could be seen at any time. Furthermore, if there is an error, it could be controlled and changed before beginning manufacturing.

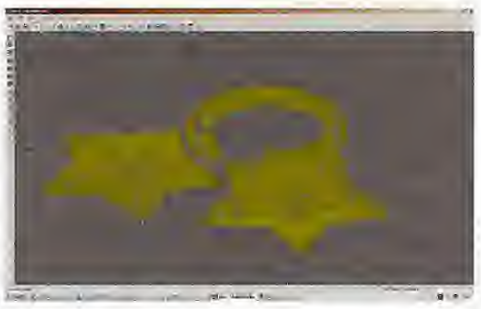


Figure 10. (Author's Collection)

There are also a lot of producing machines that produce wax models. Some of them use wax as an inkjet printer. It forms the design slice by slice, as printing wax in every slice.

InVision HR 3-D Printer: In this machine there are a lot of jets that spout hot photopolymer. There is also wax for support material. After the model finishes, the wax is melted and the model is taken.

ThermoJet: In this machine there are 352 jets. The main advantage of this machine is that you can produce high amounts of models in a few hours, so the model could be used without taking their rubber or silicone molds.

Viper si2: This machine uses hard resin and doesn't use any support material. Because the model is produced by the machine using hard resin, it could be used for silicone mold to produce high amounts. However, in other machines the wax model should be turned into a metal master piece. Then it could be put into silicone or rubber to take their molds and use them in next productions.

Solidscape-T66 (Figure 11)**:** The main advantage of this machine is that the system delivers higher precision models, prototypes and patterns than any other pattern making systems with build layers as fine as 0005 inches. It has 2 jets, one for build, and one for support material. Therefore, this machine isn't as fast as the other ones.



Figure 11. (4C Engineering, 2007)

After all the process that could be done by CAD/CAM systems finishes, the craftsmen begin to work in the other processes. Because the wax should be held and then prepared for casting. First of all the wax molds are all collected and are put on to a wax body (wax tree) (Figure 12). Then they are sent to casting. There, the wax melts and the spaces are filled with metal (silver or gold), so the master pieces are gained for silicone and rubber molds. But in some machines the molds, which are produced in the modelmaker machine, could be used as the master for building the silicone rubber mold. As

a result, the process could be shortened by the help of those machines.



Figure 12. (Author's Collection)

After the master piece is taken, it is put into the rubber and pressed in a high temperature by a press machine. After a few hours, the rubber mold is cut and the master piece is taken out (Figure 13). In this process, silicone mold could also be used. While making silicone molds, the model is fixed in a small box and then silicone is poured around the model. After the silicone has solidified, it becomes a silicone bar with the metal master piece inside. Then the bar is cut by scalpel in order to separate the bar into two parts. The master piece is taken out from the silicone bar to create a cavity. At the end of this process a silicone mold is gained from the silicone bar.



Figure 13. (Author's Collection)

Now the silicone mold could be used for casting the wax pattern. By injecting wax into the cavity inside the mold, lots of wax patterns could be reproduced (Figure 14).



Figure 14. (Author's Collection)

After all of this process the stone setters put the gem stones on the jewellery (Figure 15) and the other craftsmen polish the jewellery. At last, it is ready for the customer.



Figure 15. (Buccellati, 2000)

The Importance of CAD/CAM for Jewellery Sector

The main important role of the computer aided design is generating hard-copy engineering drawings; by its 3D representation it improves the communication between designers and the engineers, so this increases the efficiency of the design process (Kim et al., 2002). It also improves the communication between the designer and the customers.

Contrary to handmade models, the jewellery made by CAD/CAM systems brings more efficiency, time and profit to the producers. CAD softwares and CAM systems are improving day by day. In the next step the process of making rubber mold would be abolished and so the production process would be shortened.

On the other hand, trying to make all the models with CAD/CAM systems is not possible. These systems are beneficial for producing some technical and complicated pieces that are difficult to make by hand. There are still some pieces that should be made by the goldsmith. Hence, Molinari and Megazzini (2000) say that CAD/CAM isn't a substitute for traditional techniques, but as a complementary technique that helps the goldsmith to carry out some operations more rapidly and more accurately.

In Turkey, jewellery designers are just like goldsmiths or CAD operators. Therefore, they already understand the factors, such as wall thickness or structural integrity of various lengths, which affect the molds. These effective factors give opportunity to the craftsmen and the jewellery designers to

collaborate in this work. In some parts of these drawings the craftsmen could make recommendations to the designers about how the mold could be more efficient.

In CAD systems, model can be viewed at any angle during the modeling process. This technique could be determined as virtual prototyping or digital mock-up (Kim et al., 2002) because it enables to control the finished design or the mold before production. Hence, this saves time, reduces the cost and helps to realize possible mistakes. In jewellery design during the computer aided design step the designer could calculate how many gem stones would be used or what would be the weight of the design. So before manufacturing the jewellery could be shown to the customer and their wishes for the design could also be applied.

In addition, the communication between the design team and the marketing department is improved by CAD systems. In traditional design methods there was only the sketches of the design until a model was created, for this reason imagining the final product by marketing staff was very hard. With the addition of CAD, marketing staff could better visualize the final product, and make suggestions earlier in the process. The sales person could calculate the cost of design. Some revisions could be made on design before production. We could say that CAD/CAM is beneficial for every department of the company. It helps the relataionship between the departments and enables the people intervening the design process if it is needed.

Due to the precise control of the computers, more complex and detailed jewellery designs could be manufactured. Sometimes the models could be made just like the handmade products. The machines that the CAM systems are used help the producers in this stage.

As it is mentioned before, Turkey mostly ranks among the top-five countries in the world in gold jewellery production. Inevitably, jewellery sector in Turkey should produce much more jewellery. But the designs should be unique and excellent. Technological developments should be pursued by the people in this sector. In order to increase the production rate, sector should use CAD/CAD systems. These systems offer great benefits to the jewellery industry from the design stage through manufacturing process. By the use of CAD/CAM much more models and molds could be produced so that the production and exportation could gain a huge speed. It would enable Turkish design and firms increasing their export ratios. In this way, Turkish jewellery design could also compete in global market.

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FROM CHAOS TO CLARITY: THE CENTRAL ROLE OF THE DESIGNER'S APPRECIATIVE SYSTEM IN DESIGN ACTIVITY

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Abstract:

Despite design situations becoming increasingly complex designers have the extraordinary ability to clarify ill-defined design situations and design meaningful and appropriate outcomes. Traditionally understood as a problem solving process, Donald Schön (1983) described design as a 'reflective conversation with the situation', that is 'bounded' by the designers 'appreciative system' or personal knowledge. Similarly, Kees Dorst's (2006) recent framework of 'design paradoxes' suggests design problems are 'unknowable' and that design is a social process determined by the designer's capabilities.

It has been suggested that Schön's true legacy was that he 'legitimised informal knowledge' in foregrounding the agency of the designer within the design conversation (Sanyal 1997). This paper offers a contemporary re-reading of Schön's theory focused on the agency of the designer as evidenced by the use of their appreciative system. This is elucidated using description from case study research involving a novice designer. These preliminary findings suggest that novice designers employ their appreciative systems to commence designing in the absence of repertoire knowledge and to direct and structure the acquisition of new repertoire knowledge. As domain-independent activity, this offers new perspectives toward design research, pedagogy and practice.

Introduction

Despite design situations becoming increasingly complex designers have the extraordinary ability to clarify ill-defined design situations and design meaningful and appropriate outcomes. Traditionally understood as a problem solving process, Donald Schön (1983) described design as a 'reflective conversation with the situation'. This conversation is largely dependent, as is any conversation, on the phenomena the designer decides to 'attend to' (Schön 1992) and is therefore largely directed by the agency of the designer. Despite offering a significant alternative, 'rational problem solving' has dominated both the conceptual framework and the language of design discourse since the 1960's (Dorst 2006:4). Within this dominant paradigm the designer seeks to resolve the 'design problem' using an information search process within a 'bounded' problem space (Simon 1969:58). The problem space determines the design task and the designer's activity, thereby reducing the designer to a conduit for knowledge determined by the design problem. The subsequent lack of focus on 'subjective' design activity, and informal design knowledge, has reduced the designer to a 'missing person' within design research (Dorst & Reymen 2004).

Schön's epistemology of reflection-in-action represents a direct attack on normative definitions of professional knowledge. Rather than focusing on 'systematised logical domain information' (Cross 2000: 94), it is a descriptive model of 'professional artistry' (Schön 1983:VII), which validates the use of knowledge designer's cannot normally justify as 'legitimate' (Schön 1985:28). 'Reflective practice' depends on a combination of the designer's repertoire (domain knowledge), their appreciative system (personal experience, values and beliefs), and their stance (attitude). In marked contrast to a rationalist view of 'valid' design knowledge, Schön argued valid design activity results from an *internally consistent* design episode based on 'fidelity' to the appreciative system and a 'web-of-moves' (Schön

1983:94). Foregrounding the designer has been supported within Kees Dorst's (2006) new conceptual framework of 'design paradoxes' where, he states the designer can never hold a complete mental representation of the design problem because it is constantly evolving and therefore 'unknowable'. The 'ill-structuredness' of design problems may not be an a priori quality of the problem but a result of the designer's capabilities. Schön and Dorst's theories both highlight the role of personal knowledge within the qualitative interpretations or judgements necessary for socially situated design activity.

In order to locate the 'missing' designer within design activity the most subjective areas of design activity need to be examined. This paper explores the correspondence between Schön's work and contemporary theory including Dorst's 'design paradoxes' with the intention of illustrating the agency of the designer as evidenced in the use of their appreciative system within problem setting phases of design activity. The re-reading of Schön's work is elucidated using emergent findings from qualitative research exploring the design activity of a novice designer within a tertiary design degree. These preliminary findings indicate that novice designers employ their appreciative systems in order to commence designing in the absence of repertoire knowledge and to direct, and structure, the acquisition of new repertoire knowledge. The discussion and conclusion of the paper explore the ramifications of these emergent findings in terms of supporting design activity and facilitating new approaches within design research and pedagogy.

Reflective practice

Within Schön's theory of a 'reflective conversation' design activity involves an open-ended, transactional design situation rather than a 'bounded' problem space. 'Problem setting' involves the designer generating an initial 'frame' and undertaking 'move' experiments to fit the 'frame' to the situation, thereby simplifying the 'overwhelmingly complex reality' they face into something that *they* can manage (Schön 1979:265). Problem setting and problem solving work symbiotically with design activity. Schön saw problem setting as a form of 'hypothesis testing' which was 'bounded by the appreciations' or qualitative judgements made by the designer based on their appreciative system (Schön 1983:151). Rather than rejecting normative knowledge structures Schön suggested the 'designers artistry' *mediated* the use of research based theory in practice (Schön 1985:92). The designer's structured and motivated use of their appreciative system to mediate formal domain knowledge is one of the least acknowledged aspects of Schön's theory.

Viability as a form of validity

Unlike rational problem solving, which is governed by validity of the solution, reflective practice rest on the designer establishing the *viability* of their frame. Schön & Rein (1994) describe 'framing' as the process by which designers clarify chaotic or 'complex' design situations as 'radically constructivist':

> There is no way of perceiving and making sense of social reality except through a frame for the very task of making sense of complex, information rich situations requires an operation of selectivity and organization which is what "framing" means...
>
> (Schön & Rein 1994:30)

Within radical constructivism, knowledge is not independent or absolute but an 'activity or a process' (Schwandt 2000:127). The validity of knowledge is not based on 'correspondence to an independent existing world', but is valid if it is viable, or establishes a functional fit with a goal. Whereas validity is based on *elimination*, on 'identifying and removing contradictions' (Dorner 1999:7) viability is based on establishing internal consistency based on the designer's initial sense of *similarity* between dissimilar situations. This is tested and confirmed through 'fidelity' (Schön 1983:91) to a 'web-of-moves' that is 'bounded' by their appreciative system (Schön 1983:151).

Even where well defined, designers change the 'constraints and goals' of design problems (Restrepo & Christians 2004). Problem framing may not be about defining the problem or situation but about aligning it to the designer's appreciative system in order to establish 'viability'. In order to determine *how* designer's do this, it is necessary to understand *why* designer's do this.

Tolerating ambiguity

Design activity can be perceived as journey from 'chaos to clarity' because design problems are ill-defined and design activity is 'ad hoc and surprise-ful' (Cross 1999). As a result design problems are often described as 'vague' (Dorst 2006, Restrepo & Christiaans 2004, Reymen et al 2006). Vague situations require different forms of knowledge to ambiguous ones and design activity is actually ambiguous. Qualitative research parallels design activity in dealing with 'ill-structured' personal experiences (Stake 2000). Qualitative researchers Maykut and Morehouse (1994) offer the following distinction between vagueness and ambiguity:

> Ambiguity and vagueness as terms are often used interchangeably; however, these words have different meanings, which might aid to understanding tolerance of ambiguity. An ambiguous situation is one, which can be understood in more than one way. A vague situation, on the other hand, is one which lacks precision. (Maykut & Morehouse 1994:31)

Vague situations are resolved with the addition of more information but designers never hold all the 'necessary information' within ill-defined design situations (Cross 1982 224). Several studies have found that information 'gathering' is not a successful design strategy (Cross 1994: 50) and in the absence of reflection or processing, has been associated with an inability to cope with uncertainty (Cross 1994, Restrepo & Christiaans 2004). While 'the ability to tolerate uncertainty' and working with 'incomplete information' is identified with design expertise (Cross 1994:41) this is poorly understood within design theory.

Within qualitative research a 'tolerance for ambiguity' is the ability to negotiate 'multiple perspectives' (Stake 2000: 443) or 'multiple interpretations' of a situation while assessing which is merited or most 'viable' (Maykut & Morehouse 1994:31). The agency of the designer in shaping the design situation is based on similar concepts such as 'parallel lines of thought' (Lawson 1994) or 'double vision' (Schön 1983:281):

> At the same time that the inquirer tries to shape the situation to his frame, he must hold himself open to the situations back-talk. He must be willing to enter into new confusions and uncertainties. Hence he must adopt a kind of double vision.'(Schön 1983:164)

Designers *re-define* well defined design situations, because of the generative potential of maintaining 'double vision', in 'restructuring' design situations (Casakin 2004:3) and the generation of 'novel ideas' (Mumford et al. 1994:24). This argument explains *why* designers re-define or frame design situations but not *how*.

Organising principles

The unique way designers work, known as a 'designerly way of knowing' (Cross 1982: 221), is based on domain independent forms of knowledge which constitute an 'awareness' within design activity (Cross 2000:97). This 'awareness' is often alluded to across multiple design domains in the structuring activity of designers, which parallels Schön's concept of 'framing'. This type of design activity has been described as organising principles (Rowe 1987), primary generators (Darke 1979), interpretations (Goldschmidt 1988), placements (Buchanan 1995), design gambits (Lawson 2004), early representations (Restrepo & Christiaans 2004) and problem representations (Mumford 2004)

Organising principles are generally developed in action, enabling the designer to commence guided design activity in the absence of sufficient domain knowledge by 'providing a means to analyse and structure the design situation' (Darke 1979:37). Organising principles structure activity without being prescriptive. They are designed to encourage *multiple perspectives* of the design situation and experimentation within a focus of inquiry. Organising principles can change *between* design episodes and *within* a design episode. This allows for the 'conceptual repositioning' or *altered perception* that is fundamental for innovative design thinking (Buchanan 1992:13).

Because organising principles do not appear to be generated from an 'objective analysis of the design problem' (Lawson 2001:12), their actual genesis is accounted for in vague terms such as 'insight' (Restrepo & Christiaans 2004), 'intuition' (Cross 1994), and 'imagination' (Dorst 2006), resulting in a creative

'accident' (Buchanan 1992), 'leap' (Dorst & Cross 2001) or 'spark' (Goldschmidt 2003). This mystification of the genesis of organising principles has limited our understanding of the structured and motivated use of subjective knowledge within design activity.

Organising principles have however, been described as the 'necessary rationality for designing' (Cross 1994) and as an 'ordered systematic approach to the invention of possibilities' (Buchanan 1995). Known for connecting new and extant knowledge (Restrepo & Christiaans 2004), they create a 'principle of relevance' for knowledge that enables the designer to accommodate or 'filter' knowledge from multiple domains or disciplines (Buchanan 1992). The '*adaptability*' of organising principles that enables designers to *reformulate* design situations (Buchanan 1992), is based on the use of personal and social knowledge in their construction. This is possible because the designers personal experience, and the situation, are both enculturated and therefore negotiable (Restrepo & Christiaans 2004).

Goldschmidt (1988) suggests that an 'interpretation' (or organising principle) represent a 'personalised program' or a critical reading of the situation which transforms the 'pieces into a stable structure by achieving a unique relationship' between them (Goldschmidt 1988:235). The *stabilising relationship* offers a vital clue to the objective use of subjective knowledge within *structured* design activity. This idea is reinforced in Dorst's (2006) recent conceptual framework of design problems as 'design paradoxes' in which designers address a 'network of local links' rather than an absolute problem.

Socially situated design activity

Dorst (2006) holds that designers can never establish a fixed mental representation of the problem at any one time because it is constantly evolving. Instead, design problems are approached as a 'local network of links' or sub-problems within a larger 'global' problem. These links (or local actions and decisions) are determined by the designer's subjective interpretation based on their personal experience. Design problems are essentially 'unknowable' in a traditional sense, and are in fact 'paradoxical'. 'Design paradoxes' reflect the ambiguity of design situations and offer a contemporary framework of design activity, which focuses on the agency of the designer, as their solution often requires 'the development and creative redefinition of that situation' (Dorst 2006:14). Paradoxical situations are understood through their underlying 'discourses', including embedded terms and relationships. The paradox is resolved when the designer 'transcends or connects' different 'discourses' by 'stepping out' of the familiar understanding of the 'discourse' at points when design activity 'breaks down'. In effect, this alters the designer's situational perspective using their 'personal experience' and a 'strong intuitive element' (Dorst 2006:14).

'Paradoxical situations' correspond on many levels with Schön's 'reflective conversation'. Design activity, based on 'discourses' as enculturated knowledge, is socially situated and mirrors the transactional nature of the 'reflective conversation'. The alternative interpretations of normative discourses, resulting from 'break downs' within design activity, parallel the vital role of surprise in generating altered perspective in Schön's model. Most significantly, Dorst's concept of a 'local network of links' in which 'the linking behaviour of designers' relies on subjective interpretation, corresponds with Schön's 'web-of-moves', in which designers use their appreciative system to generate and evaluate subjective, local 'moves experiments' within an objective global frame. While Dorst's framework perpetuates the understanding that altered perception results from intuition, it supports a contemporary re-reading of Schön's theory based on the agency of the designer in generating these structuring relationships or links.

Naming and framing

While the use of informal and unorthodox knowledge in design activity sounds subjective and chaotic, it is structured and motivated and Schön argued, 'objective' (Schön & Wiggins 1992:13B). Unlike intuition, 'professional artistry' is 'learnable' (Schön 1983:18) and is based on the objective use of subjective knowledge in action. Schön saw 'artistry' as 'an exercise of intelligence' and a 'kind of knowing' (Schön 1986:13) which was most evident when frames are generated in response a feeling of surprise within 'unique' design situations. This activity has been summarised as 'naming-faming-moving-evaluating' (Roozenburg & Dorst 1998). While helpful in understanding the basic principles of reflection-in-action this model vastly

oversimplifies Schön's theory. This paper draws on thirty years of Schon's writing to clarify and enrich this summary.

Appreciative system in action

The designer's appreciative system is evidenced in expressions of their likes and dislikes or 'appreciations' (Schön 1985:65). Appreciations are tacit judgments which guide the decisions that designers make within a 'web-of-moves' (Schön & Wiggins 1992:168) which is 'bounded' or determined by the 'appreciative system' (Schön 1983:151). Both the 'web-of-moves' and the 'appreciative system' are essential for establishing and evaluating the viability of a 'frame'. The designer begins reflection-in-action when they form an 'initial frame' which may be completely unrelated to the situation but is designed to make 'initial descriptions' to guide further investigations (Schön 1983). These descriptions elicit surprising 'immersion triggers' (Schön 1979: 259) which generate a sense of similarity, evoking the familiar in the unfamiliar.

Significantly, reflection only begins when the feeling generated by a trigger is 'treated as information' (Schön 1985:26). This manifests itself in the 'qualitative judgments' that establish 'move experiments'. The designer's appreciative system guides what phenomena they 'attend to', or consider *relevant*, and how they *organise* them. This transforms their situational understanding from chaos to clarity by establishing a 'coherence' or a stabilising relationship between the phenomena of the situation and 'sets a direction for action' (Schön 1987:5). Each 'move experiment' is based on previous moves and suggests future moves. This 'web-of-moves' corresponds with Dorst's (2006) 'local network of links', and also highlights the relationship between the 'web' and the appreciative system in maintaining internal consistency and structuring the designers activities.

Fidelity and the structured and motivated use of appreciations

Despite employing personal knowledge, 'reflective practice' is not arbitrary when the designer maintains internal consistency *within* the design episode. Internal consistency is established within a design episode by maintaining 'fidelity' to a 'web-of-moves' and their 'appreciative system'. Fidelity enables the designer to 'recognise unintended consequences and qualities' of their actions through the continuous evaluation of previous and anticipated moves (Schön & Wiggins 1992). While moves are 'on-the-spot' experiments (Schön 1983:308), the appreciative system is generally stable during a design episode. The 'constancy of the appreciative system' allows frames to change within a design episode rather than reducing design activity to a series of 'disconnect episodes' and is essential for reflection (Schön 1983:272).

As designers become aware of 'mistakes' through 'fidelity', they establish a 'kind of objectivity' within the web-of-moves (Schön & Wiggins 1992:138). This structure enables the designer to maintain 'double vision' without 'disrupting the flow of inquiry' (Schön 1983:130) and it is this 'sequential structure' of 'seeing-moving-seeing' that enables the novice designer to manage complexity (Schön & Wiggins 1992:143). The designer's appreciative system is also employed to terminate design activity. A web-of-moves is finalised or becomes 'stable' as a results of a positive 'feeling-clue' or sense of satisfaction (Schön 1967:67) which effectively clarifies the viability of a frame and finalises a web-of-moves even though other "plausible alternatives' exist (Schön 1983:151). Although rarely discussed the evaluations or qualitative judgments made within a web-of-moves motivate and direct design activity:

> In the absence of such qualitative judgments, her designing would have no thrust or direction; it would be entirely unmotivated. She would neither be able to set problems nor to tell when she had solved them.
>
> (Schön & Wiggins 1992:137)

The link between motivation and the structuring effect of a web-of-moves is best understood through Mumford et al's (2004) model of 'creative problem construction', which bears striking similarities to Schön's model of reflection-in-action. They argue that constructed 'representations' (or frames) are based on personally meaningful 'cues' (or triggers) and that representations involving 'self-set' goals are more successful than those which are commonly accepted because they are *highly personalised* (Mumford et al 2004:24). The appreciative system is intrinsic to design activity because of its motivational role in directing what the designer attends to or deems relevant.

Seeing-as

The objective use of personal and social knowledge is not only structured and motivated, it accounts for what is generally understood as 'intuition' within design activity. Schön called this 'seeing-as' (Schön 1967) and while rarely acknowledged it may be the single most important aspect of reflection-in-action. 'Seeing-as' accounts for the recognition of phenomena as information, the identification of patterns or similarities and the generation of meaning above and beyond the meaning of individual elements or concepts through a shift in perception (Schön & Wiggins 1992:13S).

Seeing-as begins with 'sensing similarity' or mapping one concept or description onto another in response to an 'immersion trigger'. Well before the basis of this similarity is established, the designer attends to this feeling as information. 'Sensing similarity' is generative when it involves concepts which are usually perceived as dissimilar or from different domains so that 'one thing has the capacity to change everything you know about the second and visa versa' (Schön 1983:1984-8S). What has previously been understood as intuition or imagination is in fact the 'judgments embodied in acts of seeing' or *altered perception* (Schön & Wiggins 1992:137). Interpreting informal and unorthodox information as design knowledge through sensing similarity between different domains is essential for altered perception. Seeing-as, is therefore, a form of domain-independent knowledge which enables designers to move from 'chaos to clarity' in the absence of domain specific knowledge.

Novice design activity

It is often noted that Schön's model of reflective practice resonates more with design practitioners than models of 'rational problem solving' (Dorst & Dijkhuis 199S). Yet the central role of the designer's appreciative system in the early phases of design activity has been largely ignored. The excepts used in this paper to support the contemporary re-reading of Schön's theory are based on an 'intrinsic case study' (Stake 2000:437) of a novice design student studying within an integrated cross discipline tertiary design degree over a semester. This unique program exposed the novice designer Halle to a range of design domains including the spatial, object, and graphic design studios. The study focused on Halie's experience of design activity not the creativity of her design outcomes. Several key patterns emerged within her design activity, which are common to all three studios across multiple briefs. These emergent categories help exemplify the central role of the designer's appreciative system within design activity.

Halle entered university directly following high school. Halle's parents and step-parents are 'arty and musical' and she identifies with this creative legacy. For instance, she is proud that she sings in the alternative choir they helped found, and writes and performs her own music. This informs Halle's design activity with a strong sense of self-determination, independence and confidence.

Halle is motivated by differentiating her ideas from her peers admitting 'I don't like the idea of making something that I am not going to like and really sort of feel like "that's not mine"'. She resists doing things that she 'has to do' or in the way 'they' want her to, and prefers choices based on her personal interests. Halle wants ideas to 'have quiet a lot of information' embedded in them so that they are not 'obvious'. Halies believes that her design activity begins chaotically but is clarified by developing 'random things, that could be anything, and that's how my mind will start working out what I am going to do, and how I am going to do it'.

Random ideas

One of the most elucidating aspects of Halle's design activity is her pervasive belief that her design concepts are based on 'random ideas' which she defines as 'things that seem unrelated or out of place'. Random ideas are a spontaneous response to a brief, often based on visual or verbal stimulus within her immediate vicinity. Although her attention is almost always drawn to something associated with her personal interests and memories, these connections are 'tacit'. Halle's belief that her ideas are 'random' enables her to be *surprised*. In fact Halle's initial response to a brief sets up what she attends to. When give a brief to design a box to hold 'memories', Halle thought of a 'mousetrap' that 'snaps' on memories. Her initial response however, was an appreciation of the brief, based on an aversion to one of the design criteria, which called for an examination of 'surface and texture':

> You know, texture, surface, and all that kind of stuff, and I thought "Uhh it's really like crafty kind of stuff and I can't stand that kind of stuff.

Halle depends on her appreciative system to sense 'random' ideas. They are only 'random' because they are base on informal and unorthodox knowledge not domain knowledge. The 'mousetrap' metaphor is based on Halle's personal interests, which include a childhood fascination with mechanisms, a preference for making over drawing, for kinetic over static objects, and for form over colour, texture, and surface. Halle establishes self set criteria based on these preferences, which then inform what she attends to as a 'random idea'. For instance, Halle perceived a 'limited colour palette' in a brief where it didn't exist.

To stimulate 'random ideas' Halle often conducts a literal key-word search based on the title of the brief. Halle considers these to be 'random' searches because she actively seeks stimulus that amuses her because is **not** logically connected to the brief. In this way 'random' searches maintain an open stance toward surprise and enable Halle to interpret her appreciations as information:

> I would find something really random that I thought was funny, that I could somehow link to the brief and then I would get more inspired to do it and then I'd start working on it a bit more.

Halle believes 'random ideas' are essential to move from 'chaos to clarity' stating that she needs to 'get the random ideas before I can develop it into something that really makes sense'. Halle develops random ideas through activity she calls 'branching'.

Branching

'Branching' is the means by which Halle connects disparate concepts to form a unique interpretation or frame. Branching usually involves generating a metaphor which combines abstract ideas, based on personal appreciations with situational information derived from the brief or domain research. While 'branching' is initially chaotic, 'little branches' lead to 'unity and clarity':

> Going through random stuff to find something to go through it. So like the chaos theory where everything looks chaotic, and then in the chaos you find the system and then the systems relates to the brief.

Random ideas as 'initial frames' structure 'branching' by directing her response to information. In the 'memory box' example, Halle conducted a key-word search on 'memory' resulting in 'cognitive maps'. Her metaphor of a mousetrap led her to connect 'maps' with puzzles and a mechanical toy her little sister had been recently given. Halle framed the idea of the memory box as a toy associated with childhood memories. She connected the toy to her understanding of branding based on the book 'No Logo' that her father had given her and arrived a fame for a hollow promotional toy which evokes memories. Halle thereby connected extant personal knowledge (of mechanisms) with new personal knowledge (of consumerism) and domain knowledge (cognition and packaging). This example illuminates how the appreciative system both structures and motivates design activity and connects formal and informal knowledge.

Halle terminates 'branching' following a sensation of clarity with a concept, stating, 'as soon as I get some sort of clarification in my concept, that's when I start making' which mirrors Schön's theory of fidelity within a 'web-of-moves'. Whilst Halle believes her design activity is 'not really uniform' because of the use of 'random ideas' and 'branching', her design activity is in fact very uniform over her three studios. It only appears *un-uniform* because it depends on informal and unorthodox knowledge. Although Halle's concepts are very different in each studio they are often based on the similar triggers or 'random' ideas. This cross-fertilisation corroborates Mumford et al's notion that representations are based on highly personal cues and goals. Neither Halle nor her tutor understand the determining role her appreciative system is playing in her design activity.

Relationship with origami

Two significant events take place during the study which illuminate the central role of Halle's appreciative system within her design activity, both of which relate to legitimising the use of her strong personal interest in modular origami.

Halle believes her 'obsession' with modular origami is a *personal* interest because it was seeded by her father and is self-directed. It represents a meta-interest associated with a her fascination with mechanisms, mathematics, geometry, modular systems and making things. Halle has cultivated this interest through personal goals which she describes as 'trying to find new paths' and applied it (despite protests by teachers) to many art and design projects. The depth and duration of this personal knowledge corresponds with Schön's concept of 'constancy of appreciation'.

Halle describes the most significant event in her design education as the validation of her use of modular origami. Prior to this event, Halle was finding it difficult to 'connect' to her briefs. In a brief transaction Halle showed her tutor some sketch models based on modular origami analysing the design of a coffee pot. Halle suggested it 'would have looked like it had nothing to do with it, but I found some sort of little way that it related', and that the tutor 'understood', and explained that she believed it was Halle's 'way of visually communicating'. This affirmation finally legitimised her use of this personal knowledge and enabled her to personally connect with her briefs.

In an inverse situation Halle's use of this personal knowledge is misunderstood by both herself and her tutor. When conducting a random search for stimulus for a shelter design Halle discovers the 'next level up' to modular origami in Santiago Calatrava's book on 'flexible geometry'. While aware of his work from lectures Halle associates this discovery with her 'obsession' because 'it just summed up everything that I was interested in' and interprets it as a 'random' idea that 'just sort of appeared in front of me'. Halle identified a 'foldable cube' from his models as a potential form for her shelter and made a replica which she presented. Her tutor's reaction also marks a significant event for Halle:

> I was still really buzzing and I said 'I have something I have to show you' and I showed her this little model that I had made of what I wanted to make and she said 'Yeah that's really cool but you have gone a step too far and I don't want you to do that ...'

Both Halle and her tutor interpret the model as a prototyped final design rather than an extension of the experimental medium of modular origami. Halle responded to the 'foldable cube' because of her personal interests and because the initial frame she had establish for her project of a *portable* shelter based on philosophical ideas of private space she had previously researched. The model could have functioned as a 'move experiment' used to test her 'initial frame' of a "portable" shelter leading to a stable final frame. Because Halle's tutor failed to demonstrate *any* kind of 'move' for Halle to imitate, she was unable to connect her personal and domain knowledge and generate a strong solution from her initial frame. Halle was unable to manage a complex web without support. Interestingly, she remained motivated by the discovery of flexible geometry despite failing to fully resolve her project and for the first time associated her personal interest with legitimate *design knowledge*:

> I mean now it's good because I've actually still found it and I still have that knowledge in my mind

Halle has used this *knowledge* effectively in subsequent projects suggesting personal interests seeds domain knowledge.

Discussion and Conclusion

A contemporary re-reading of Schön's theory of design as a 'reflective conversation with the situation' offers an insightful model of design activity which accommodates ambiguity and the objective use of subjective knowledge. It highlights the agency of the designer as evidenced in the use of their appreciative system. This model corresponds with 'organising principles, 'design paradoxes' and the motivational aspects of 'creative problem construction' which help enrich our understanding of Schön's theory, and novice design activity.

What often appears to be 'opportunistic' undisciplined design behaviour is the use informal and unorthodox knowledge to structure, motivate and evaluate design activity in the absence of sufficient domain knowledge. The emergent categories of 'random ideas' and 'branching', within the case-study, illuminate the central role of the appreciative system within Halle's design activity. In the absence of domain knowledge, 'random ideas' enable Halle form and understand interpretations as information and experience the altered perspective necessary to generate innovative frames. Subjective random ideas

are structured and rendered objective through 'branching' within an associative network of explorations, 'bounded' by her appreciative system. Branching enables Halle to filter and adopt new multi-disciplinary domain knowledge in relation to her extant personal knowledge. Halle's design activity not only illustrates the central role of the designer's appreciative system but the need for it to be legitimised and supported in order for novice designers to resolve complex design situations. The 'particularised' design tutoring called for by Schön (1987) may require tutor to demonstrate 'moves' for 'imitative reflection' which accommodate the designer's appreciative system in order to bridge the gap between domain and personal knowledge.

This new presentation of Schön's theory suggests design is a socially situated activity, that depends on the negotiability of enculturated personal and situational knowledge, which enables the altered perspective necessary for innovative design. This becomes objective within an evaluative structure such as 'local network of links', or web-of-moves, which maintains internal consistency within the design episode and enables the designer to generate a stable relationship for the phenomena of the situation or a 'frame'. The objective use of subjective knowledge in 'problem framing' offers a new perspective of domain independent knowledge. The appreciative system does not prescribe the outcome of design activity but enables designer to filter information from multiple domains or disciplines. How designers structure and motivate the objective use subjective knowledge requires further research. While designers are as unique as design situations, the central role of the appreciative system is the basis of a domain independent 'designerly way of knowing', and the principle means by which designers move from chaos to clarity within design activity.

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NEW CATEGORIZATION FOR A VIRTUAL ON-LINE POSTER MUSEUM

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Abstract

The University of Aveiro is at present developing a project involving the construction of a virtual on-line poster museum, containing around 40,000 artifacts.

Given the large number of posters in existence, and the great diversity of representations, this paper describes the development of the project and the reasons behind the creation of "key topics," which function as gateways to other related information on the web – metadata. It also presents the proposed key topics, considered as a tool that allows the visitor access to contents, not only from the perspective of traditional classifications and catalogue, but also from the point of view of design.

The categorization of topics is essential to establish a particular order in the collection, and is a way of orienting the visitor. The exhibition is therefore no longer imposed by the museum but rather is constructed according to the visitor's own choice, allowing each visitor to effectively curate their own exhibition.

It also proposes a new concept, relative to the access to and availability of contents, taking as a basis the creation of a classification system with particular characteristics that could serve as a reference for other virtual on-line poster museums.

1. Introduction:

Creating a taxonomy (the word comes from the Greek taxis – order + nomos – law) involves establishing rules and order by means of a system that sets up species, groups, families and genres of subjects. A taxonomy can help in the classification of posters by setting up divisions, linked by topic, subject and graphic content. However, it is a complex task, since any single poster may deal with a number of different subjects, therefore allowing it to be categorized in a number of different ways. Given the large number of artefacts, it will be necessary to specify the criteria used in the creation and implementation of the taxonomy. There are four processes involved: orientation, cataloguing, indexing and classification itself.

Orientation is based upon an indexed lexicon that is organized hierarchically, thereby enabling a prioritization of terms, from the generic to the specific. The poster thesaurus of the Library of Congress (which provides an exhaustive list of interrelated

terms, organized alphabetically and systematically ordered) was used as a reference and indexation aid.

Cataloguing involves the physical description of the documents. Many different descriptions can be used depending upon the specific characteristics of the document in question (author, title, printer, dimensions, etc), but the same descriptive model has to be maintained, always in the same order. In Portugal, the RPC and ISBD (NBM) are used.

Indexing is the construction of terms relating to the concepts used in the document. It involves the description of information contained and the allocation of keywords, which lead off to more detailed subjects, concerned particularly with the type of message and what this represents (eg. 25th April, yellow, flowers, gouache, off-set, etc.), always aiming to be user-friendly. Clip is a Portuguese example of a document-indexing tool, which standardizes topics for inter-library use.

Classification involves attributing codes (a combination of letters and/or numbers) to subjects, resulting in an ordered division of information. The Universal Decimal Classification (UDC) system is used in Portugal. For the construction of the on-line virtual museum, the Unimarc standard and Aleph system (part of SINBAD Digital Library and Archive Integrating System) were used.

Given the variety of rules and methodologies available for the technical processing of documents, we hoped, with this selection, to obtain a degree of representativity similar to that used by international institutions and systems, while at the same time taking into account Portuguese cultural matters and the specific nature of the artefacts existing in the museum. For this, it was necessary to modify, adapt, add and remove some of the information made available through the processes described above. However, we also felt the need to analyse other reference sources, particularly specialist publications about posters, in order to take account of the criteria used by those authors in the creation of their classification systems.

As the construction of a thesaurus is very complex, it is hoped that this work might function as a platform from which such a project might be launched. The word 'taxonomy' was felt to be a more appropriate term than 'thesaurus' for the information included here. As indexing is related to the thesaurus and given the lack of a thesaurus of posters in Portuguese, the decision was taken to create a taxonomy for the museum.

The main body of the text may or may not begin with a subtitle. The main text is also12 point, normal, single space, Times New Roman. The text is aligned left, a single space is allocated between the paragraphs and the new one is again aligned left as you see below.

2. Various systems used for the orientation, cataloguing, indexing and classification of artefacts.

Although various thesauri exist, the one used by the Library of Congress was chosen for being the most extensive for the processing of non-book material, and also because it makes available all the information produced within the framework of library science. Considered to be the oldest and biggest library in the world, the LoC is internationally respected for its preservation and technical processing of different types of artefact. The universality (as regards subject matters covered) and diversity of its collection have meant that this library has rapidly distinguished itself in the field of research. It provides an encyclopedia, or lexicon, of graphic materials in two parts, namely: TGM I -*Thesaurus for Graphic Materials I* and TGM II - *Thesaurus for Graphic Materials II*. This term list is organized hierarchically, facilitating use by museums, archives, libraries, collectors and researchers, and serves as a tool for the creation of taxonomies for graphic artefacts, with the purpose of standardizing the system used by different institutions.

> The thesaurus provides a controlled vocabulary for describing a broad range of subjects depicted in such materials, including activities, objects, types of people, events and places. TGM I includes subject categories only. Thus, proper names of people, organizations, events and geographic places are excluded. Art historical and iconographical concepts are not included, but TGM I does supply terms for abstract ideas represented in certain types of images (...)[1]

[1] Library of Congress – TGMI. [On-line]. Washington: LoC, 1993- . [Consulted 1 Jun. 2006]. Available on WWW: <URL:http://www.loc.gov/rr/print/tgm1/ia.html.

While the TGM I serves to index subjects based upon a specific terminology, giving rise to terms represented in the graphic material, the TGM II (*Thesaurus for Graphic Materials II*) adds information relative to the documents and allocates descriptive terms for different kinds of graphic materials, i.e. it distinguishes between different types of material, setting up categories according to types, such as (in relation to posters): intention and objective (publicity); characteristics of the created image (done by children, students, designers, etc); type of publication or occasion (censored of celebrated); type of representation (abstract, landscape, monuments etc). All artistic movements and styles are excluded. The physical characteristics of the graphic materials used have also been included, such as production methods and techniques (off-set printing, lithography); materials (photograph, airbrush, gouache), format and size (rectangular, square, etc, and respective dimensions). 'As graphic collections grow and catalog records accumulate, it is clear that additional access points greatly facilitate research related to functional categories, production contexts, and artifactual aspects of graphic materials'[2]. An online search of the LoC using the keyword "poster" results in 45 preferential and 27 non-preferential hits, making a total of 72 terms (with associated references in some of them).

Posters
Art exhibition posters
Use Term: Exhibition posters
Billboard posters
Book & magazine posters
Burlesque posters
Use Term: Theatrical posters
Campaign posters
Use Term: Political posters
Carnival posters
Use Term: Circus posters
Circus posters
Concert posters
Dance posters
Election posters
Use Term: Political posters
Entertainment posters
Use Term: Performing arts posters
Exhibit posters
Use Term: Exhibition posters
Exhibition posters
Film posters
Use Term: Motion picture posters
Magazine posters
Use Term: Book & magazine posters
Magic posters
Use Term: Theatrical posters
Minstrel posters
Use Term: Theatrical posters
Motion picture posters
Movie posters
Use Term: Motion picture posters
Music posters
Use Term: Concert posters
Musical play posters
Use Term: Theatrical posters
Newspaper posters
Use Term: Book & magazine posters
Opera posters
Use Term: Theatrical posters
Performing arts posters
Periodical posters
Use Term: Book & magazine posters
Political posters
Posters
Propaganda posters
Use Term: Political posters
Protest posters
Revolutionary posters
Use Term: Protest posters
Reward posters
Use Term: Wanted posters
Rock and roll posters
Use Term: Rock posters
Rock posters
Sport posters
Use Term: Sports posters
Sports posters

[2] Library of Congress – TGMII. [On-line]. Washington: LoC, 1993- . [Consulted 1 Jun. 2006]. Available on WWW: <URL:http://www.loc.gov/rr/print/tgm2/ia.html.

Stock posters
Theater posters
Use Term: Theatrical posters
Theatrical posters
Tourist trade posters
Use Term: Travel posters
Travel posters
Vaudeville posters
Use Term: Theatrical posters
Wanted posters
War posters
Wild west show posters
Use Term: Circus posters"[3]

This list allows the librarian or researcher to retrieve the information required, functioning as a kind of guide through the various types of posters and other information available.

For cataloguing, the RPC (Portuguese Cataloguing Rules) and ISBD/NB(International Standard Bibliographic Description for Non-Book Materials) were selected. The RPC (1984) operates through the application of cataloguing rules for the choice and form of headings, and may be used for the cataloguing of graphic material. The ISBD(NBM) specifies the information necessary for the description of non-book material, orders that information and distinguishes items using a point system. The objective is to achieve universal compatibility in cataloguing. Like other models, it aims to transcend the language barrier, allowing records to be exchanged between different institutions, irrespective of culture.

As regards indexing, the Portuguese project Clip (1989) was selected. This aims to standardize indexing in various subject areas, including Design (1993), producing a hitlist of 56 preferential terms and 24 non-preferential. It is presented in the form of a thesaurus in order to simplify the equivalence between terms, though it can be updated and modified according to need.

Although different classification systems exist, such as Dewey's or Ranganathan's, we chose the European system UDC (Universal Decimal Classification), created in 1895, because it is closer to Portuguese culture. At present, it involves fifteen countries, with publications in seven languages, and enables data to be organized irrespective of the physical characteristics of the object. It is suitable for museological and internet application, amongst other things, facilitating the exchange of data between different organizations by means of conventional signs, thereby overcoming language barriers, like the ISBD(NBM). This system is constantly being restructured to supply up-to-date information, taking account of revisions, modifications and corrections introduced annually. The use of this model by various organizations effectively standardizes the classification system and permits the same language to be obtained by different searches. The Portuguese CDU is based upon the UDC and uses arabic numerals across ten areas of knowledge. These are in turn divided and subdivided into logical parts, resulting in around 62,000 numbered classifications. The numbering allows an unlimited number of combined subjects to be further combined, leading to an infinite number of possible combinations. This hierarchical representation is presented in simplified form, and its degree of complexity varies according to how many numbers are combined.

For the cataloguing of records, Portugal uses the Unimarc system for the organization of bibliographic references, which consists of a standard defined by the IFLA (International Federation of Library Associations and Institutions) enabling the exchange of records concerning the physical appearance of the document. Unimarc contains a particular number of information fields, which are filled in following the rules of the ISBN (NBM) and RPC standards, as in indexing, classification and orientation.

Aleph, for its part, is a computer programme based on Unimarc, which enables the cataloguing of records in accordance with the Unimarc standard.

SINBAD is a computer system developed by the University of Aveiro, which makes available all the preceding information in

[3] Library of Congress --TGM I: summary of features [On-line]. Washington: LoC, 1993- . [Consulted 1 Jun. 2006]. Available on WWW: <URL:http://www.loc.gov/lexico/servlet/lexico?usr=pub-281:0&op=keyword2&db=TGM_I&term=!poster#gohere.

structured form. It consists of the summarised description of the Unimarc records, where the information is stored in XML, allowing importation of Unimarc records available by Aleph.

3. The classification system adopted by some leading publications

Over the course of this research, some publications about posters were selected in order to study the distinctions made by some authors in the creation of their own taxonomies, thereby furthering our knowledge of the subject and broadening our horizons as regards the existence of and reasons for different systems.

Françoise Enel distinguishes three types of poster (commercial, propaganda and cultural), justifying this division on the basis of differences existing between them. The first, she claims, is related above all to business and thus links economics and society; such posters are not only informational in character, but also seek to influence consumers by stimulating desires and inciting them to buy. 'Arousing complex feelings like desire for prestige and respectability, the poster stimulates new needs and creates tensions in the individual, while at the same time suggesting how those tensions can be resolved' (Enel 1974:118)

Normally, this type of poster is large format and has a simplified message and picture, using as few graphic elements as possible in order to cause the biggest impact.

As regards the propaganda poster, she considers that this differs from the commercial poster in that there is no direct sale of any product, despite the fact that a message is transmitted between the organization and the public. 'This category includes all posters that could be considered to be "of public interest", in the sense that they do not 'sell' a product or doctrine as such, but function rather as a way of protecting the individual - against alcohol, the destruction of the environment, etc.' (Enel 1974:119)

The propaganda poster uses similar resources to the commercial ones, Enel points out; it establishes communication in a similar way via image, text, colour, composition and rhetoric, and uses similar persuasive techniques that operate subconsciously. The differences reside only in the desired results. While the commercial poster seeks to arouse sentiments of possession, wellbeing, status, etc, the propaganda poster attempts to stimulate subconscious feelings or emotions of hope, life, death, rivalry, fear, sensitivity, etc, thereby changing people's behaviour.

As regards the cultural poster, Enel considers all those concerned with intellectual and artistic activities, generally aimed at a more restricted audience and transmitting more specific information which does not need to be understood by everybody. Unlike other types of poster, cultural posters are related to cultural events. '(...) the concert, exhibition, conference... They scarcely use the persuasive techniques of the commercial poster. The cultural poster does not attempt to manipulate reality or to give it any kind of mythical charge' (Enel 1974:127-128)

This category includes posters for shows and films. Abraham Moles reduces the number of categories to two, i.e. advertising/commercial posters and political/propaganda posters. Although the message and representation techniques are the same, he claims that the former is concerned with socioeconomic matters while the latter includes non-advertising organisations. However, he also considers that posters may be classified according to their message and representations, presenting the following classification system, to which he attributes the following characteristics:

(1) poster that has been photographed or drawn
(2) poster in black and white or in colour (two-colour, four-colour)
(3) use of argumentation or seduction
(4) primitivist (- Savignac) or elaborate
(5) poster of a recognisable "style", eg. 1900-style, 1926 (Art Deco) style, or "modern", or no appeal to any definite date.
(6) abstract, symbolic or concrete (high degree of iconicity, eg. packed soups) (Moles 2005:199).

In addition to this classification, he suggests a system of records that could be applied to posters. The various classifications are presented on the same record card with the subjects listed above, from which one subject can be selected for each

classification. However, he considers that this information may be complemented by other subjects of interest, such as:

- intensity of colour shock/clash;
- retention rate on an empirical scale;
- dimensions of poster;
- length of text, etc.' (Moles 2005:201)

John Barnicoat provides yet another classification system, consisting of the following categories: Artistic Posters (including Arte Nouveau, those related to Symbolism, and Hippy Posters); Modern and Professional Posters (including posters related to Formal Artistic, Decorative and Contemporary Movements); Posters and Reality (Expressionism, Realism and Surrealism); Posters and Society (the People's Poster, Poster and Humour, Political Revolutionary Posters and War), and finally, the Three-Dimensional Poster. Throughout his publication, he describes posters using terms that could themselves be understood as categories and subcategories, such as the advertising poster, anonymous poster, film poster, tourist poster, war poster, recruitment poster, heroic poster, etc, finally including these different types in the examples already given. This often results in a certain overlap, such as the Realist Poster of Mussolini by Xanti Schawinsky (1934), which is also related to the Society Poster in the subcategory Political Poster.

Finally, Müller-Brockmann and Shizuko Yoshikawa's system consists of the following categories: Illustrative Poster; Objective-Informational Poster, Constructivist Poster, Experimental Poster and Series Posters.

> Among illustrative posters we include those designs which represent situations, people or objects shown by straightforward graphic or photographic means. Objective-informative posters are those which impart factual information in as objective a manner as possible. Their designs suppress any subjective artistic feelings, and an almost anonymous expression is typical of these posters. The arrangement always forms the basis of a constructive poster (...). There is a harmonious ratio between the whole design and its constituent parts, and the 'structural' aspects predominates. The experimental poster always surprises. Its forms, and variety of forms, appear strange at first because they still do not belong to the form-vocabulary of their time. The best of these posters are ahead of their time (Müller-Brockmann 2004:9).

As regards the Series Posters, they consider three types based upon colour, form and text. Any of these discourses or possible relationships between them may be included in this category, which is based upon the predominance and repetition of one or more of their characteristics, allowing people to identify them as belonging to a poster series.

4. Creation of a taxonomy for the on-line poster museum

None of the existing systems and models available for orientation, cataloguing, indexing and classification have really succeeded in providing a closed and stable structure for the poster. Language barriers may be overcome but cultural differences, those unique characteristics specific to a country or even experienced within a particular country itself, are not really accounted for. It was for this reason that we felt the need to create a new taxonomy for the on-line poster museum (while of course recognising it as one possible system rather than *the* definitive taxonomy). This taxonomy would have to be sufficiently open-ended to be able to adapt to the specific demands of the poster as the whole collection is gradually analysed and researched or as new posters are added, and it would have to be flexible enough to allow new information to be included, and avoiding a rigid or self-enclosed model.

In order to bring together different reference sources to create a terminology that is appropriate to the area of design, a specific methodology was sought that would enlarge the range of information available on this theme. Thus, the on-line poster museum serves as a vehicle by means of which other information may be introduced and accessed through specific headings. It does not propose to be a new thesaurus to rival the American one, but rather sets up a list of terms with a particular logic that can serve as indexes for the subject. The visitor may enter the museum through headings related with four main subject areas. What is new is the sheer diversity of information available upon entry to the museum, topics which function as access portals to other subjects. While a thesaurus excludes events and proper names (of people and organizations), this on-line museum includes these and other matters in its taxonomy, particularly

as regards the area of design and the graphic message existing in each poster. This makes it into an innovative concept, which may be used as a model for similar museums in the future.

The taxonomy draws closer to existing models in its treatment of representations, mobilizing conventional criteria from the field of Design as regards the study of form, which is perceived as an informational category in itself. The arguments represented in each poster allow for the creation of a new taxonomy.

At present the collection contains around 40,000 posters, and is likely to increase in number. The inclusion of new posters may lead to new representations and consequently to new subjects, and so the taxonomy needs to be flexible in order to accompany the growth of the collection.

If we look at Clip in the area of Design, we can see that the indexing terms are interrelated. It presents a vast list of topics, covering the whole field of Design, and thus served as an orientation tool for the construction of the taxonomy for the on-line museum, particularly as regards Design-related themes. Of the 56 preferential indexing terms, 19 were selected, and some of the headings were altered in order to adapt them to the particular needs raised by the poster.

The CDU system was adopted for the classification of the posters, the Unimarc for the organization of records, and Aleph for the cataloguing of those records in accordance with ISBN(NBM) and RPC standards. At present, the on-line poster museum is integrated into SINBAD, which permits access to information in a structured way (although the presentation of information in the museum is as yet provisional in character).

As visits are expected from a wide range of different publics, the information may be accessed from five perspectives: 1.History of the Poster; 2.Categories; 3.Authorship; 4.Exhibitions; and 5.Observations. The information will be presented chronologically, and will cover topics ranging from history, politics and economics to Design-related subjects. It may also target more specific publics, as in the case of Categories, which is subdivided into the following main and subsidiary topics:

2.1. Subject matter of posters (general topic concerned with the thematic characteristics of the poster):

Performing arts posters (posters designed to advertise theatrical performances and other types of entertainment or to promote artistes without reference to any particular event).
Film posters (posters for films and cinematic events).
Circus posters (posters for circuses, festivals, shows, etc).
Concert posters (posters for orchestras, solo instruments, vocalists and other musical performances).
Sports posters (posters advertising sporting events, such as football, basketball, tennis matches, etc, or to commemorate sporting figures).
Exhibition posters (posters for art exhibitions, inauguration ceremonies, trade fairs, etc).
War posters (matters related to war, including military or civil support and propaganda).
Books and magazines posters (posters that advertise books, magazines, newspapers, journals, etc)
Educational posters (posters on education-related matters, or which instruct, educate or sensitise the public about specific issues).
Political posters (including election campaigns, posters on social / political subjects or about environment, health, civil rights and propaganda).
Protest posters (posters that comment upon or criticise social aspects, are related to propaganda or support a revolutionary movement).
Rock posters (promotes concerts of rock or other kinds of popular music or musicians).
Sensitization posters (posters that sensitize the public in some way, are concerned with social issues in the sense of protecting people or the cultural / natural heritage, or are related to a historical event, commemorating a political, national or popular occasion, irrespective of subject).
Souvenir posters (posters that can be purchased in specialist poster outlets, second-hand bookshops and antique shops, that are reprints or artefacts where the concept of the poster has priority over what it represents or communicates, or which are collector's items).
Theatrical posters (posters for theatre plays, singers, musicians, poetry recitals, comedy acts, burlesque, variety shows, opera, musicals, reviews, magician shows or other stage acts)
Travel posters (posters promoting tourism generally, trips or means of transport, such as railways or boats).
Others

2.2. Poster design (general topic relating to the design/ creative aspects of the poster):

Abstract posters (includes representations of anything that does not exist outside the abstract realm).
Artistic posters (posters with a strong artistic component, not only as regards the means of representation but also in the way the message is communicated, and which reveal artistic influences).
Calligraphic posters (posters with manually executed text: with serif; sans serif; mixed).
Concrete posters (posters with factual and objective representations, unlike the artistic poster, or which have characteristics that are almost non-expressive and which do not allow the author to be recognised).
Colour posters (term relating to the use of colour in the poster: black and white; monochrome; two-colour; three-colour, etc.).
Drawn posters (image created using lines or patches).
Style posters (posters in a clearly-defined identifiable style: Arts & Crafts; Arte Nouveau; Wiener Werksatte; Futurist; Cubist; Constructivist; Bauhaus; Hyperrealist; Pop Art; Minimalist, etc.).
Formal posters (posters in which the formal aspect or composition is particularly important or where there is a logic between the parts).
Experimental posters (posters with shapes that do not have any obvious logic, or which shock and surprise, particularly when decontextualised from the formal stereotypes of an era).
Geometric posters (posters with mostly geometric shapes or shapes that are generally geometrically simplified).
Illustrated posters (includes representations of anything that does not exist, although it has a realist presence).
Pattern posters (posters consisting of repeated motifs).
Symbolic posters (posters containing images that have become icons over time).
Typographic (lettering) posters (posters with a typographically-executed text: with serif; sans serif; mixed).
Others

2.3. Poster as Physical Object (general topic concerning the physical characteristics of the poster as three-dimensional object):

Billboard posters (poster composed of a series of sequential sheets mounted in a particular order)
Dual-sided posters (posters printed on the front and back).
Stock posters (poster with generic pictures and spaces left blank in order to be reprinted later with new information).
Sequential posters (series of several posters forming a sequence).
Three-dimensional posters (posters that communicate their message three-dimensionally, unlike the traditional poster).
Posters dimensions (large format; medium format; small format).
Posters format (square; rectangular; other shapes).
Others

2.4. Production Technologies (general topic concerned with the technological characteristics used in the production of the poster):

Posters in Adobe Illustrator (uses the computer as a production resource).
Airbrush posters (uses airbrush as a production resource).
Water colour posters (uses water colours as a production resource).
Collage posters (uses collage as a production resource).
Drawing posters (uses drawing as a production resource).
Photographic posters (uses photography as a production resource).
Photomontage posters (uses photomontage as a production resource).
Freehand posters (uses the computer as a production resource).
Gouache posters (uses gouache as a production resource).
Pencil posters (uses lead, graphite or colour pencils as a production resource).
Charcoal posters (uses charcoal as a production resource).
Mixed posters (uses more than one production technique).
Pastel posters (uses pastel as a production resource).
Photoshop posters (uses the computer as a production resource).
China ink posters (uses china ink as a production resource).
Others

2.5. Reproduction technologies (general topic concerned with the technological characteristics of the printing process

used to reproduce the poster):
Xylographic posters (uses xylographic printing as a reproduction resource).
Lithographic posters (uses lithographic printing as a reproduction resource).
Serigraphic posters (uses silk-screen printing as a reproduction resource).
Off-set posters (uses off-set printing as a reproduction resource).
Digital posters (uses digital printing as a reproduction resource).
Others

2.6. Design (general topic concerned with the design subjects presented in the poster):

Designers associations (posters about or by designers associations).
Posters & representations (feminine; masculine; objects; flowers, etc).
Design centres (posters about or by design centres).
Design competitions (posters advertising design competitions).
Design conferences (posters advertising design conferences, including congresses, lectures, meetings, etc)
Colour in the posters (access to posters by colour; how many blue posters exist; the most commonly used colour; the predominant colour, etc).
Companies related to the posters (RED, JCDecaux; space rental; formats of spaces for the posters; who affixes them; affixation techniques, etc).
Design education (posters relating to the teaching of design; courses; training schemes; workshops; polytechnic education; higher education).
Spaces for posters (the development over time of spaces for the placement of posters).
Design exhibitions (posters advertising design exhibitions in this area).
Design offices (posters advertising designers' offices; design workshops; advertising agencies).
Printers involved in the printing of the posters (list of printers that print posters; short history of graphics – when new printing technologies were adopted, etc; information may be presented geographically with the country divided into the northern, southern and central zone, and thus, gradually, a map will be developed presenting the density of printers per Km2).
History of printing technologies used for posters (presentation of miscellaneous subjects, such as: how they developed; how they evolved; when they were adopted, etc).
Brand image (covering various aspects, such as logotypes, which aim to give coherence and unity to the visual aspects of a company or institution's activities; often extended to other artefacts – flyers, advertisements in magazines, newspapers, radio and TV).
Impacts of technology on poster printing (the effect of technological intervention or technological limitations upon posters).
Logotypes (posters that present logotypes).
Materials used in the production of posters (eg. paper – its history; raw materials; manufacture; development of print sheet formats; formats most used for posters; papers most suitable for printing posters; papers selected by the designers, etc.).
Materials used for the reproduction of posters (eg. inks - history; raw materials; manufacture; inks most used for posters, etc).
Print runs (research into the numbers of copies printed at one time: 100, 200, 500 copies, etc).
Use of language (posters whose language has altered across time).
Others

3. Authorship (general topic concerned with individual or collective authorship):

Advertising agencies (posters created by advertising agencies, where collective authorship is more important than individual).
Design workshops (posters created in design workshops, where the author is a collective rather than individual identity).
Anonymous posters (posters of unidentified authorship).
Author posters (posters identified by an author or where the authorship is identifiable through the graphic language used).

4. Exhibitions (general topic concerned with exhibitions organised by the curator): to be proposed

5. Observations (complementary topics):

Collecting (collecting as a memory-recording action; motivations for collecting - monetary value (investment), rarity (exclusivity), pleasure (acquiring, keeping, possessing artefacts).
Historical note about the on-line virtual poster museum (description of the construction of the museum, to function as a record; technical team; donors, contributions, etc).
Influences of the poster upon society, politics and the economy (information about the poster's influence upon the contexts described above and vice-versa).
Publications about the poster (list of topics concerning the publication of books, articles etc on the subject of the poster or related themes).
Publications about the on-line virtual poster museum (list of subjects indicating all publications related to the museum).
Others

While categories 2.1 and 2.6 are similar to the system used by the LoC and Clip thesaurus, 2.2 is closer to the models mentioned in the publications about posters. For this reason, the TGM II[4] was analysed, and it was found that some of the terms used to describe and exemplify posters led to the same result (eg. political and protest posters); both refer to similar subjects, which meant that it was possible to insert the same poster into two different categories. In analysing this thesaurus in detail, it was found that differences exist in the respective descriptions according to the function of the poster (i.e. publicizing, informing, advertising, persuading, promoting, supporting, etc); however, there were also redundancies. The same thing occurs with Clip. Consequently, it was found that it was impossible to make a division and attribute categories without an inevitable overlap.

Although it is always possible to link the different descriptions, the five main subject areas are designed to act as access portals to other subthemes, while at the same time allowing further subthemes to be added in accordance with the museum's needs.

5. Conclusion

Given the diversity of the existing thesauri, it was decided, for this museum, to divide the posters into taxonomies in accordance with the needs of the collection, while at the same time taking account of existing orientation, cataloguing, indexing and classification processes. Differences emerged between the LoC and selected publications as regards the classification systems used for different posters. While the former is based essentially upon the principles of library science, the publications were attempting to move away from this form of indexing to create references more closely associated with the discourse of graphic design.

The taxonomy of this new museum made use of subjects related to both library science and the publications, with Design functioning as the common denominator. This opened up a whole range of subjects, making the museum's collection accessible to visitors with very specific requirements. The result is an information-retrieval tool that is easily adapted to the needs of each individual visitor and is cross-referenced to facilitate use. In addition, the sheer range of the taxonomy allows the model to be applied to different types of poster.

The aim of this project for the creation of the taxonomy for the on-line virtual poster museum of the University of Aveiro was to set up an open architecture that would enable new subjects to be included as the collection grows and diversifies. The resulting system for the accessing and retrieval of information within this genre of document may serve as a model for other such museums in Portugal and abroad.

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[4] Library of Congress – TGMII. Ob. Cit.

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DEVELOPING THE BRAND OF A BORN GLOBAL COMPANY FROM TURKEY AS A NEWLY INDUSTRIALIZED COUNTRY: THE GAIA&GINO CASE

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Abstract

This paper reviews the development process of a design intensive brand, Gaia&Gino, from a newly industrialized country[1] setting. The fact that the brand targeted the global market right from its inception makes it an interesting example to study in relation to the concept of "born global". The paper examines the strategic steps taken by the founder company Decorum Inc. to establish Gaia&Gino as a global brand. By examining these steps in terms of their potentials in creating an alternative path for gaining a share in the global market, the paper aims at discussing whether pursuing a born global strategy can be a viable strategy for growth for a company located in a newly industrialized country. The paper particularly focuses on how the design and production functions were organized and managed in the business model created for developing the Gaia&Gino brand. The findings indicate that the brand is based on an original business model highly benefiting from international networks of production and communication. Another indication is that being positioned as high design value and price, the brand benefits from a global vision of operation. This is particularly important for a company operating from a newly industrialized country setting as such a country, would typically suffer from an unsophisticated consumer culture due to low income levels and limited product offerings.

Introduction

Since the early nineties, the emergence of dynamic, newly established small and medium-sized enterprises which internationalize right from their inception (or shortly after) and compete against well-established, large companies in the global markets have drawn great attention. Several studies were conducted to identify and explain these types of firms, whose internationalization behaviour fit into none of the existing models. Labelled as Born Globals, these firms have chosen different paths to become global players and their emergence has already grown into a big phenomenon.

Born Global companies first emerged in small, open economies such as New Zealand and the Nordic countries. In these cases, rapid internationalization was essential for the survival of the companies. However, the emergence of these firms are not

[1] A Newly Industrialised Country (NIC) is one which is a developing country but has not yet achieved the status of the advanced countries (The Penguin Dictionary of Economics, 1987).
According to Er (1994) what makes NICs interesting in terms of design research is that they are the only developing countries which attempted and succeeded, at least in some sectors, to establish an industrial design activity. The most significant common characteristic of NICs is that they have explicitly attempted to develop their economies on the basis of industrialisation (Dicken, 1986 quoted in Er, Ö., 1995)

specific to these countries. They exist in other places such as the USA, the UK, France and Israel (Rialp-Criado, Rialp-Criado and Knight, 2002). The Born Global companies, that emerge from countries with different economic structures should also be investigated to contribute to the existing literature.

Gaia&Gino is the brand of a design intensive Born Global company from Turkey. Since its launch in 2004, it has gained international reputation and Gaia&Gino branded products have been sold in prestigious shops in major cities. The fact that Decorum Inc. positioned Gaia&Gino as a global brand right from the beginning is the main factor which took our attention to it. Could this strategic choice be an example for other companies in Turkey which face the problems of an unsophisticated consumer market due to the low-income level of the majority of its population? In this paper we will try to investigate the Gaia&Gino case, which is a brand of home accessories, to reveal its way of doing business in becoming an internationally known brand.

The Concept of Born Global

The first researcher who referred to the "Born Global" term was Michael W. Rennie (1993). McKinsey & Co consultants, while doing a research on the emerging Australian high-value-added manufacturing exporters, discovered the rise of small and medium- sized enterprises (SMEs) that successfully compete against large, established firms in the global market starting from the beginning (Rennie, 1993). The data indicated that the export behaviour of these firms did not conform to the two models, which define internationalization as an incremental process starting with national operations: The Uppsala Internationalization Model (Johanson and Vahlne, 1977) and the Innovation Related Export Development Models (Bilkey and Tesar, 1977; Çavuşgil, 1980; Reid, 1981). The data was soon studied by Çavuşgil (1994) and the theory of Born Global was developed.

Several definitons of the Born Global concept were made according to different criteria such as the firm's establishment date, export-to-sales ratio, time spent between the period of the first export and its founding and organizational behaviour. For instance, Rennie emprically defines Born Globals as the companies that 'began exporting, on average, only two years after their foundation and achieved 76 percent of their total sales through exports' (1993). Knight and Cavusgil define them as 'business organizations that, from or near their founding, seek superior international business performance from the application of knowledge-base resources to the sale of outputs in multiple countries' referring mostly to the technology-oriented companies (2004, p.124). Mika Gabrielsson defines these type of firms as 'those that from their inception pursue a vision of becoming global and that often globalise their business rapidly without an earlier longterm domestic or internalization period' (2005, p.199). In this paper, the researchers refer to Moen's definition of these firms as companies 'having export sales higher than 25 percent and an establishment date post 1990' (2002, p.156).

The Characteristics of Born Globals and the Key Influences on These Firms

There has been numerous studies, which identify and examine the internal and external influences on these firms and trends behind their emergence and continuous rise. These can be grouped as: (1) Globalization and the homogenization of buyer preferences around the world, (2) present market conditions (change in customer demands, the increasing importance of niche markets for SMEs worldwide), (3) the technological improvements in the areas of production, transportation and communication, (4) the increased number of business executives and enterpreneurs with international experience, (5) the increased importance of international networks and alliances and (6) easier access to financing (Rennie, 1993; Knight and Cavusgil, 2004; Rialp-Criado, Rialp-Criado and Knight, 2002; Falay, 2006).

The characteristics of Born Globals have been identified in several studies. These companies usually emerge from small and open economies, in which quick internalization is the way to survive (Falay, 2006). They are mostly SMEs, whose size give them the flexibility to internationalize faster. Born Global companies usually operate in highly specialized niche markets (Rasmussen and Madsen, 2002). Rennie (1993) states that they create a market where they have almost no competitors by understanding and satisfying the needs of a particular group of customers. Geographical distance is not a factor for these companies since they rely on international networks and

form strategic alliances. Born Globals have different branding strategies than traditional companies (Gabrielsson, 2005). The past experiences and global attitudes of their founders are also characteristics of them. As young enterprises, these firms need to compete with their limited sources (Falay, 2006). On the other hand, they rely more on a group of intangible knowledge-based capabilities (Knight and Çavuşgil, 2004).

Although recent studies about the phenomenon seem to have been focused widely on high-technology businesses, Born Globals operate in all industries and in all major trading countries. Rennie (1993) asserts that to be successful, these companies need to compete on quality and value. Besides, Knight and Cavusgil (2004) mention that these firms tend to benefit from technological skills, relatively unique products and a great focus of quality to sell their products worldwide. The innovative corporate culture and proactive attitudes of Born Globals are also emphasized.

Design Intensive Born Globals

Born Globals appear to exist in five different product categories, which are high- tech, high-design, high-service, high-know-how and high systems (Gabrielsson, 2005). Although, most of the studies address high-tech product groups, these companies have also found their place in the design industry.

There are examples of companies which rapidly internationalized by using design as the main core competence to compete in the global markets. Falay (2006) states that design industry enables companies become Born Globals by providing an open arena where these companies can focus on highly specialized niches, make small volumes of production feasible and gain price advantage by the perceived value added by design. Gaia&Gino can also be considered as a company specializing in a global niche market with a distinct design identity.

The Case of Gaia&Gino

Gaia&Gino is the design brand of Decorum Inc. from Turkey. Decorum Inc., which was founded in the first quarter of the 1990s, has an export rate of %100 and design being its core competence, is an example of a design intensive Born Global company. Below we will try to explain its particular globalization experience on the basis of our semi-structured interviews with the founder and the marketing responsible of the company and our search of the secondary resources including newspapers, national and international magazines and the internet.

From an Importer to the Creator of a Global Design Brand

Decorum Inc. was founded in 1992 by Gaye Çevikel. The mission of Decorum has been stated as 'to develop design consciousness in Turkey and to orient customer tendencies in this direction' (Teoman, 2005). In line with this mission, Decorum initially became the agent of world-known textile design companies, such as Creation Baumann, Rubelli and Zimmer+Rohde and sold their products at Decorum stores. The company then started to sell the design products of world-famous design brands such as Alessi and Kosta Boda. Having introduced numerous design objects to Turkey, Decorum has been one of the pioneers of design in the domestic market (Teoman, 2005).

Gaye Çevikel did not have a formal design education. However, as her father is an architect, she had developed an understanding of aesthetics. She was educated on political sciences and has a master degree on international relations. After working at the World Bank for two years, she has decided to do her dream business and founded Decorum Inc. (Akgün, 2006).

By the year 1999, relying on the company's 8-years-experience in the sector, Gaye Çevikel decided not to continue only as an agent and a shop owner but to launch their own products which would be sold at Decorum stores. With this aim, they decided to collaborate with Defne Koz, a Turkish industrial designer who lives and works in Italy. She designed Liquids glassware collection that was launched in 2001. The company made its first export with this collection which was labelled under "Decorum I s" brand (Çevikel Interview, 2006).

Gaye Çevikel, who has been attending seminars on brand management at Harvard Business School by the time Liquids glassware collection was introduced, decided that Decorum Inc. should make a new move to establish an international

brand and launch its own collections. Çevikel believed at the time and still believes that a Turkish company can very well invest in design and establish an international design brand. The company decided not to continue with "Decorum I s", since the name of the company and the brand was so close and could cause confusion (Bonofiyel Interview, 2006).

The studies for the new brand continued between the years 2001 and 2004. Defining the right brand name was the most difficult of them. Believing that the new brand which will operate in the global market should also represent their own story, they seeked for the right brand name for two years and also got professional help. However, it was Decorum team who came up with the winning idea: Gaia&Gino. "Gaia" is Gaye Çevikel's nickname and "Gino" is the name of her dog. Gaye Çevikel explains how they came up with the brand Gaia&Gino:

> All of my team voted for Gaia since they believed that the brand should represent my values. Then came "Gino" because we wouldn't only launch home products. We made a research and found out that the most important product category in the USA was the pet products. My story is that I have a dog and Gino symbollically appeared in the brand name. "Gaia" represents people like me, people who are aware of design, look for differentiation in their lives and bound up in their individuality. "Gino" represents their pets. We offer products which they can use at their homes and for their pets (Çevikel Interview, 2006).

The previous experiences of the team with the Decorum stores have constituted a beneficial reference during the operations of Gaia&Gino. The team had intense knowledge about design, products and customers' preferences (Bonofiyel Interview, 2006). Çevikel emphasizes that there wouldn't be Gaia&Gino if there hadn't been Decorum and adds with her own words: 'If we weren't working with Alessi, I wasn't visiting that many glass factories of Kosta Boda and visiting that many design fairs, we wouldn't have this background' (Çevikel Interview, 2006).

Gaia&Gino was first launched during the New York International Gift Fair in August, 2004 (Bonofiyel Interview, 2006). Decorum Stores continued for a while afterwards. The company shut down the stores in September, 2005, because the team wanted to draw all their attention to Gaia&Gino. Koleksiyon Inc. which is a prestigeous home and office furniture manufacturer with its own stores became the distributor of the brand in Turkey. Decorum Inc. still continues to be the agent of Alessi in Turkey also sold in Koleksiyon and other stores such as Bill's in Turkey.

The Aim of Gaia&Gino

The aim of the Decorum team in creating the Gaia&Gino brand is to operate in the world's designer's home accessories market with a product range of global appeal. This aim however does not exclude the reference to the Turkish culture when it can be a rich source of inspiration for new product ideas or styles and also the promotion of the Turkish cultural influence if it is seen as creating added value. According to Çevikel, Gaia&Gino aims to enter into the world's best stores with their tabletop home and pet accessories and become one of the worldwide known design brands (Çevikel Interview, 2006).

Strategic Steps to Set Gaia&Gino as a Global Brand

Positioning Gaia&Gino as a global brand right from the beginning, the company has taken strategic steps in branding, distribution and sales, production and design to achieve the aim of becoming an internationally known design brand in a short period of time. Çevikel defines their focus of investment: 'We invest in design. Design investment is the biggest investment. In addition to that, we invest in marketing, selling and branding as the most important of them. Brand value is the most difficult to achieve' (Çevikel Interview, 2006).

International Organizational Structure of Gaia&Gino

The organizational structure of Decorum Inc. was changed to operate more effectively with Gaia&Gino (Çevikel Interview, 2006).

At present, the administrative office is located in Istanbul. The managerial organization has a horizontal structure. There are five responsibles working in the office who directly report to the founder and the president of the company, Gaye Çevikel.

They are responsible for (1) Marketing and Sales, (2) Logistics and Storage, (3) Visual Arrangements, (4) Finances and (5) Accounting.

Gaia&Gino works with external design consultants and outsources its production. Gaia&Gino's warehouse and logistics units are located in Germany. Also, its product development team operates in Germany.

Purposeful Choice of Markets

Although Gaia&Gino is a brand created in Turkey, it hasn't chosen the Turkish market as its primary target. The size of the Turkish market for high end design products is too small for the company to see Turkey as its target (Kaynak and Kara, 2002; İkinci, 2003; Anonymous a). The fact that their warehouse is located in Germany and production distributed to various countries makes them a global operator. As such, the Turkish market does not have a specific role or priority in their operations. Gaia&Gino has been export-oriented since its initiation.

The brand has chosen its primary markets purposefully. The most important primary market has been defined as the USA market. Çevikel explains the reasons as: 'Europe is a saturated market. There is no energy. The USA market is incredibly unsaturated. It has the power and wealth to accept the new. The second reason is I love New York (Çevikel Interview, 2006).' The other primary markets of the brand are Japan, the UK, France and Italy. Çevikel states that France has been a country from where basic trends originate and adds that it is important to win recognition in both the French and the Italian market, which are followed by world's design environment. She also emphasizes that the Far Eastern market is the second important market for them after the USA (Çevikel Interview, 2006).

Today, Gaia&Gino products are sold in twenty five countries, at five continents. Apart from its primary markets, Gaia&Gino products are also sold in Germany, Australia, Austria, Belgium, China, Denmark, Indonesia, Holland, Swiss, Sweden, Cyprus, Korea, Lebanon, Luxemburg, Mexico, Portugal, Russia, Saudi Arabia, Taiwan, Turkey and Greece.

Gaia&Gino has targeted the high-end segment of the home accessories market, which has been mostly dominated by European design brands. As to position in this segment requires high design input and high production quality, there are relatively less competitors in this niche.

Careful Determination of Gaia&Gino's Product Groups According to Its Primary Markets

Gaia&Gino has carefully chosen its product groups according to its target markets. The brand plans to operate in four different product groups in the future, but presently offers designer's home accessories and dog products.

1. Tabletop Home Accessories Group: These are also characterized as gift items, which include bowls, vases, candle holders, glassware, tableware, etc. The initial focus of Gaia&Gino has been on this group. The brand has been offering its tabletop home accessories collections to the world market since its initiation. The company also included Liquids glassware collection, which was launched under "Decorum I s" brand in Gaia&Gino collections.

2. Dog Products Group: The first collection for this group, "Gino the Dog", was designed by California College of Arts students, who were directed by designer Yves Béhar and was launched during Milan Design Week in April, 2006. Introducing its dog products as its second product group is a good example of the brand's careful determination of product groups according to its primary markets. Çevikel mentions that pet products appeared to be the most important product group during their research about the USA market and that is how Gaia&Gino decided to offer dog products designed specifically for the US market (Interview, 2006).

3. Personal Accessories Group: The first group of products for personal accessories category was "Queens and Kings" jewellery collection, which was designed by Arik Levy. As the fairs and distribution channels of personal accessories are different, the company decided to withdraw the collection and enter the market with a wider range of products in the future (Bonofiyel Interview, 2006).

4. Office Accessories Group: Gaia&Gino hasn't launched any collections for this group yet.

Strategic Steps to Promote the Brand Globally

Gaia&Gino has been trying to increase its brand awareness with intense PR activities for their first five years. Çevikel believes that the first thing to do is to create brand awareness through various means such as news about their operations, the awards that they have won, the fairs that they have participated, etc. rather than direct advertising (Çevikel Interview, 2006). In line with this belief, Gaia&Gino works with four different PR agencies for its four primary markets. The company works with PR agencies in the USA, Germany, Italy and France. The PR agency in Germany also operates in the UK.

Since May 2004, Gaye Çevikel has been introducing Gaia&Gino all over the world as the founder of the brand. She has been personally meeting with the press members, visiting the customers together with the agents and distributors, telling them about Gaia&Gino. She emphasizes the importance of press and customers recognizing her and hearing the story of the brand from her (Çevikel Interview, 2006). Gaia&Gino enters every market with a party, because when a brand is introduced to the press during a party, it captures more attention.

As mentined before, Gaia&Gino was first launched in August 2004 during New York IGF. After that, they had a one-year promotion tour, to which Karim Rashid also contributed. The tour included promotions in Tokyo, Paris, Frankfurt, Milan, New York, Montreal, Australia and again Tokyo respectively. The last promotion took place in Koleksiyon Campus in Istanbul in 2005.

Gaia&Gino has been participating in the most prominent fairs, New York International Gift Fair, Maison&Objet Paris and Ambiente Frankfurt since its launch. In addition to participating to these specific fairs, they have organized events and openings during Milan and New York design weeks. These promotional activities took place at their venue sponsor Sportmax's stores. The choice of the venue outside of the fairgrounds is also a strategic one as they want to create a separate PR occasion for themselves.

The designers that Gaia&Gino has been working with, have also been an effective contributor to their efforts to create brand awareness. As they are well known in the target markets and market segments of Gaia&Gino, designers such as Yves Béhar, Karim Rashid, Constantine Boym, Arik Levy and Andrée Putman have attracted attention to the Gaia&Gino brand. The choice of well known designers in its primary markets is a strategic one by itself to reach the goal of becoming a global brand in a short period of time.

International Network of Distribution and Sales

Gaia&Gino's aim about its distribution channels is to sell its products in world's prestigious stores. In line with their aim to be a global brand in the high end of the home accessories market, Gaia&Gino has organized the distribution of its products in a way that they are available in the target markets. The founder company of the Gaia&Gino brand, Decorum Inc. had already defined target stores when they started a special glassware collection (Liquids by Defne Koz). Gaye Çevikel has visited the defined stores in the USA, France and the UK between the years 2001 and 2002. The first collection they sold in these stores was Liquids glassware collection under the label of "Decorum I s". The company was in continuous communication with these stores during the period in which Gaia&Gino products were developed (Çevikel, 2006).

Presently, Gaia&Gino products are sold in 232 stores worldwide, including department stores, prestigious design stores and important museum shops. Gaia&Gino controls its sales and distribution network with its agents, distributors and Far Eastern area manager. They have distributors operating in the USA, Australia, Italy and Turkey and agents in Denmark and France. Gaia&Gino products are distributed all over the world from the warehouse in Germany, whose operations are controlled from the administrative office in Istanbul.

The company doesn't want Gaia&Gino products being sold at every store because they believe this would harm the brand value. Çevikel, emphasizes that they plan not to be in more than a thousand stores when the brand starts fully operating in all of its product groups (2006). In line with this belief, the stores, which will sell Gaia&Gino products are audited according to some criteria; such as their location and the store itself, the other brands they represent and the specifics of their commercial agreements.

Gaia&Gino also defines strategic goals for special collections. The promotion of "Gino the Dog"collection started in three

stores in the USA and "the Lucky Collection" of Andrée Putman is sold in ten stores all over the World (Çevikel Interview, 2006).

Gaia&Gino plans to start its stores after the first five-year period, when the brand will financially settle down and brand awareness will come to a level. Çevikel believes that it is wrong to open their own stores before the products are recognized in other stores. She mentions that they will start corners in the same stores where their products have already been sold and the first Gaia&Gino store will be started in the USA (2006).

International Organization of Production

Gaia&Gino products are manufactured by partner factories, which are located in Turkey, Germany, Italy, France, Slovenia, Czech Republic, Poland and China. Çevikel emphasizes that having no factory investment is a great advantage that they can work with different materials (2006). Presently, Gaia&Gino tabletop home accessories are produced of traditional materials, such as glass, porcelain, crystal and metals.

As a brand operating at the high end of the market, Gaia&Gino seeks for high quality production. The factories, which will produce Gaia&Gino products should meet some quality specifications. They are audited by product development specialists and production agents, and also visited by the Gaia&Gino team. Çevikel states that all the partner factories, which are either middle or large-scale enterprises, work with best technologies (2006).

The product development team of Gaia&Gino works with the factories during the product development phase and for the production of prototypes. At the production stage, the producers are given detailed production manuals, including quality specifications, drop test parameters, packaging and labelling details, etc. (Çevikel, 2006).

International Organization of Design

As mentioned before, Gaia&Gino doesn't have an in-house design team and plans to continue to work with external designers. In the administrative office, one 'responsible' works for visual representations who directly reports to Çevikel.

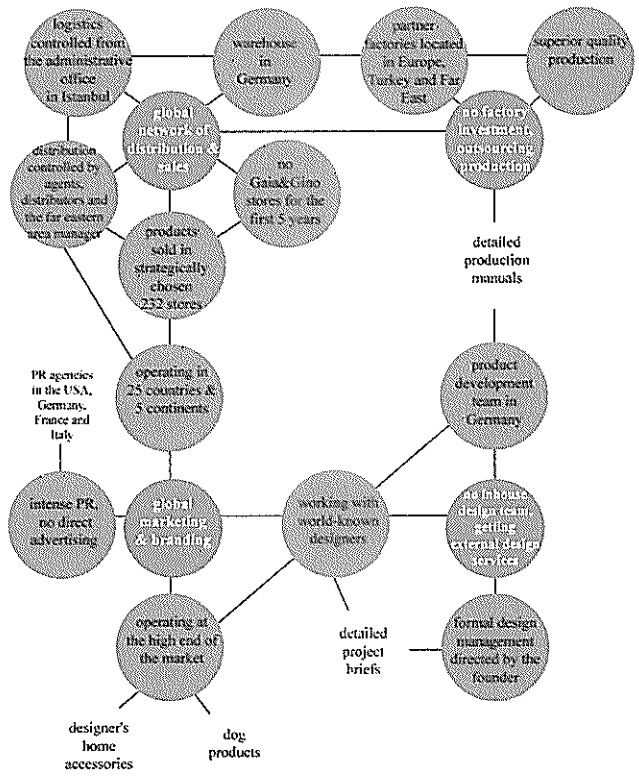


Figure 1. The activity map of Gaia&Gino

Gaia&Gino has a product development team located in Germany, consisting of product development consultants. There works three industrial design engineers who are gratuates of the Royal College of Arts. Each consultant has different areas of specialization, which are (1) glass production techiniques, (2) porcelain production techniques and (3) metal and plastic production techniques. The team has a horizontal structure, where each member directly reports to Gaye Çevikel. The product development team is responsible for working with the designers in order to optimize designs for production, listing the right factories to work with and working with factories during the product development and production processes.

Gaia&Gino has also been working with a consulting office in Italy, for the development of dog products which are catagorized as dog furnitures. This office, independent from the product development team in Germany, will give services for a short time.

Reputed Designers of Gaia&Gino

Gaia&Gino strategically prefers to work with world-known designers. In addition to contributing to the global branding efforts of the brand, Gaia&Gino designers also provide commercial knowledge about the brand's target markets, as they are outstanding designers of Gaia&Gino's primary markets.

Thirteen designers have worked or still working for Gaia&Gino, some of who are; Defne Koz, Karim Rashid, Arik Levy, Andrée Putman, Yves Béhar, Constantine Boym and Denis Santachiara. Çevikel believes that working with different designers is what differentiates their products (Çevikel Interview, 2006).

Gaia&Gino chooses the designers according to some criteria. Çevikel defines that the most important common characteristic of Gaia&Gino designers is their having multicultural rootes (Çevikel Interview, 2006). They are used to different cultures and/or work with companies from different countries. Çevikel adds that, another common characteristic of Gaia&Gino designers is that none of them has a "geometric" design language. Gaia&Gino represent "softer lines" of life (Çevikel Interview, 2006). The fact that external designers work with different sectors in their professional lives is also another factor for their preference as they would use the knowledge and experience of these sectors for new product ideas (Çevikel Interview, 2006).

Identity of Gaia&Gino Products

Çevikel believes that its products should reflect the philosophy of a brand (Çevikel Interview, 2006). She defines Gaia&Gino products as "unconventional", having "a sense of humor" and "simple design but high concept". Çevikel emphasizes that every product has its own story (Çevikel Interview, 2006).

Perception of Design within Gaia&Gino

Gaye Çevikel defines design as "the heart of Gaia&Gino" (Yasak, XII Magazine, 2006). She emphasizes that every individual of the company is aware of design. Gaia&Gino refers to the opinions of its team, consisting of individuals with different cultural and disciplinary backgrounds, at every level. They also get continuous feedbacks from its agents, distributors and the area manager.

All the design activities of Gaia&Gino is personally managed by Gaye Çevikel. Also, the administrative team effectively contributes to the design activities.

Gaia&Gino has a holistic design approach. Apart from product design projects, packaging design, exhibition and stand design and web and graphics design projects are undertaken by professionals. These designers are chosen according to the quality, contemporaneity and distinctiveness of their previous works. To name some, they have worked with Derin Sarıyer (a well known Turkish designer) for stand designs, the first product photographs were taken by Christopher Kicherer who is a famous architectural photograph artist and communication consultant of world- known brands and the logo of Gaia&Gino was designed by Ali Cindoruk, a Turkish designer living in the US.

Managing Design in Gaia&Gino

Gaia&Gino design projects are personally managed by Gaye Çevikel. Gaia&Gino follows a formal design management policy. The design and product development processes are controlled by comprehensive, written design briefs, which define each stage of the product development process and mutual responsibilities (Çevikel Interview, 2006). The design briefs consisting of projects goals, customers' identity, marketing and sales data, desired product identity, product typology, materials and production specifications and a detailed time table are constituted by the contribution of all the divisions of the company.

Traditionally, the designers of Gaia&Gino are invited to Istanbul first. They spend two or three days in Istanbul, familiarizing with the company culture, philosophy of the brand, Turkish culture and the Gaia&Gino team. Meanwhile, they are given the design briefs (Çevikel Interview, 2006). After almost a month, designers send their sketches to Istanbul. Çevikel (2006) emphasizes that it is very important for her to see the skecthes in the early stages. These sketches are evaluated by Gaye Çevikel, the administrative office and the product development teams.

From that point, Gaye Çevikel works with designers. Proceeding on the sketches, they decide on the final design and compose the stories of the products. Çevikel, compares their system to Memphis' style and the relation between the owner of the Coca- Cola company and the designer Raymond Loewy in the 1970's (Çelikel Interview, 2006). She mentions that they develop right products within the synergy that arises between her and the designer.

After the form of the design is approved by Gaye Çevikel and the materials are defined, product development team takes over and from that point Gaye Çevikel only participates in the process for topics related to dimensions, colors and quality.

The product development specialists work with designers to optimize the designs. As the process evolves, the 3D CAD outputs and the prototypes produced by the partner factories are shared with the Gaia&Gino team. The production phase starts when the feasibility of the design is approved.

Gaia&Gino's Success

Launced in August 2004, the Gaia&Gino brand is in the process of growing. Although it has become self-supporting in the short period since its start, the brand has not brought the expected financial profit yet. Considering its short existence, it is much more appropriate to measure the success of the brand with qualitative signs of achievement such as brand awareness, media coverage and the awards received.

The four products that are listed in the Gaia&Gino product range won four prestigious design awards all of which evaluate both the quality of design and production:

1. "Liquids" Glassware Collection, Designer: Defne Koz (1999), 2002 GOOD DESIGN Award in "tabletop" category (exhibited at the permanent collection of the Chicago Athenaeum Architecture and Design Museum).

2."Morphescape" Tableware, Designer: Karim Rashid (2002), 2005 DESIGN PLUS Award (became a part of the permanent collection displayed in the Museum of Applied Arts, in Frankfurt), nominated for the 2006 DesignPreis Award.

3. "Mistic" Candleholder/Vase/Sculpture, Designer: Arik Levy(2004), 2006 DESIGN PLUS Award (became a part of the permanent collection of the Frankfurt Museum of Applied Arts) Nominated for DesignPreis 2007.

4. "Kari, Ari, Arim, Rim" Candelabra/ Budvase, Designer: Karim Rashid (2002), IDEA 2006 Bronze Award (featured in the the highly anticipated 2006 IDSA National Conference's Design Gallery and Expo) (http://www.gaiaandgino.com/news_en.asp).

Gaia&Gino has also been covered by the world's prestigious design and life style magazines. Although Gaye Çevikel complains about the lack of interest of the Turkish media, the interest of the international media in the brand is rising. Financial Times recommended "Kaz Candleholder" as one of the best ways of spending the money in its "How To Spend It" column in Febuary 2006. Wallpaper recommended "Liquids wine glass" as one of the twenty five ways of improving one's life in its December, February 2006 edition. Karim Rashid's "Happy People Glassware Collection" was covered in Time's Style and Design 2006 Winter annex. Indesign magazine widely covered Gaia&Gino in its February 2006 edition. *O At Home* magazine has also covered the brand in its 2005 Winter edition. Besides these, many design and life style magazines have been praising Gaia&Gino as the "Turkish Delight" or "the Turkish Treasure" (http://www.gaiaandgino.com/press_en.htm).

Conclusions

Before making any concluding comments, the researchers admit that the time period between the foundation of Decorum Inc. and their first export- which is approximately 9 years- may cause confusion about the company's Born Global identity. Many researchers (Rennie, 1993; Knight and Cavusgil, 2004) would expect a time period of approximately 2 years after the initiation for starting the firm's export activities. On the other hand, other researchers (Gabrielsson, 2005; Moen, 2002) avoid giving a specific time period and mainly consider the export rates and behaviours of these firms. Focusing especially on Gaia&Gino operations, the company's behaviour overlaps with the defined characteristics of Born Globals.

As a result of the research, it was discovered that the company has structured itself on an original path to compete in the global markets. Its global vision, design intensive approach, strategic choice of markets and product groups, strong use of networks and strategic branding activities constitute a unique activity map (see Figure 1).

The founder's global vision and personality have been effective on the company's decision to establish Gaia&Gino as a global brand. Besides, the team's previous experiences with Decorum stores were beneficial for making the right choices for the brand operations.

Design is the core competence of Gaia&Gino. It was discovered that, they have generated a formal design management strategy, which is conducted personally by the founder with the assistance of other divisions of the company. The team has a holistic approach to design, which is another factor for developing unique products.

Gaia&Gino has placed itself at the high end of the designer's home accessories market and targeted a highly specialized niche of customers with its unique product designs, high quality production and premium pricing. As the domestic market of Turkey for the high end of this sector is so small, the brand chose to operate globally and draw its attention to the unsaturated market of the USA, as its first primary market. The product grups of Gaia&Gino were also chosen according to its primary markets. Right positioning in the global markets leads to success.

Operating in twenty five countries and five continents, Gaia&Gino has benefited from the strong use of networks for its production, design, distribution and sales within its international organization. The brand has strategically chosen to make use of external design services, outsource its production and establish a network of distributors, agents and the area manager to control its ditribution and sales activities.

Gaia&Gino has delicately structured its branding and marketing operations to increase the brand awareness in the sector, ignoring any activity that may harm the brand in long term.

To conclude, Gaia&Gino appears to be a successful design intensive Born Global from Turkey. Despite its short existence, the brand has mentioned to increase its brand awareness in the global markets and the media coverage about it has been expanding as four of its collections won prestigious design awards.

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DIRECTIVE, DISCREET, DISCRIMINATORY: MODERN SIGNAGE AND THE DESIGN OF GENDER

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Abstract

In this paper we intend to reflect upon the way pictography, as used in modern signage, far from being (as it was said to be, during the modernist optimism of the 70's) a sort of "universal", intuitive language on the contrary seems to have some limitations as a communication form.

Not only signage pictography does not have a universal reach (as any other language, it relies on education and context), but its own "universalistic" pretensions, demanding a high degree of redundancy, tend to result in the use of caricature and stereotyping. Namely when it comes to represent gender. This unemotional, apparently detached area of information design, we argue, has therefore its ideological moment, ineluctable perhaps but one which is important to understand and to document.

Our study is based on a contents analysis of 49 signage systems and 767 pictograms from different countries and periods. The results lead to the conclusion that female gender has always been underrepresented in signage systems, and also "marked" in relation to the generic male form or false neuter, with male figures being generally used to represent "people in general".

1. introduction

1.1 from pictography to signage

By the beginnings of the 20th century, with city growing, proliferation of administrative services, trade and leisure spaces; with economic globalisation and population mobility, situations began to occur where national languages (or rather their correlative typographic characters), were sometimes replaced with advantage by small pictures, i.e. pictograms.[1]

The first serious attempt to create an organized system of *graphic signs* is due to the Viennese sociologist and philosopher, who later emigrated to London, Otto Neurath. In the earlier 20's, Neurath was convinced of the possibility of creating an international pictographic idiom, which he would call Isotype. Through his system it would be possible to educate and bring together the different people of the earth – as with Esperanto, the artificial language created by the end of 19th century under the same ideal.[2]

Isotype consisted basically of using simplified images (silhouette) to transmit information in the areas of economy and social statistics; it was used mainly in books, posters, maps and other didactic material (Fig. 1).

But Neurath's project resulted also from his activity as a philosopher: he was a leading-figure of Logical Positivism, a philosophical movement that developed initially in Vienna, in the years 1920-30, and had among its objectives the search of an ideal language, descriptive and logical, thus superior to current language, full of imprecision and deficiencies.[3]

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[1] On the faith in pictography as an easily understandable, intuitive language see KRUG, K.-H. et al., [undated], p.2; COSTA, J., 1998, p.89; DREYFUSS, H., 1984, pp.16 and ff.; AICHER, O., and KRAMPEN, M., 1995., pp. 5, 129; OTA, Y., 1993, p.18; HORTON, W.,1994, p.6.

[2] ZAMENHOF, L., 1887. Charles K. Bliss, who worked with Neurath till Second World War, developed a hieroglyphical system (Semantography) sometimes called "visual Esperanto" – see OTA, Y., 1993, p. 218. According to MODLEY, R., 1976, ix, "...we may well call Otto Neurath the 'Father of Pictography'."

[3] GRANGER, G.-G., [undated], pp.83-86; CORDON, J. M. and MARTINEZ, T., 1987, pp. 149-59.

Neurath believed to have discovered such a language in Isotype, a sort of intemporal, hieroglyphic idiom, in which it would be possible to transcribe all the languages of the world –an optimism that remains at the very basis of present-day pictographic signage and, to a certain degree, continues to inform the teaching and the practice of design.[4]

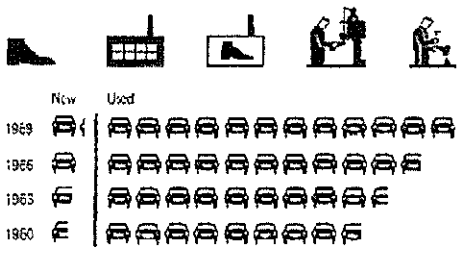


Figure 1. Isotype symbols. Top, from left to right: "shoe", "factory", "shoes factory", "industrial production", "handmade production"; bottom: car numbers in the USA (each symbol equals 6 million cars).

Neurath's researches are also contemporary of the first international conventions aiming at the unification of traffic signs, one of them held in Vienna, in 1927 (Fig. 3). The late 1940's, on the other hand, mark the first attempts to use pictograms in sport events. At the first, though, these were more "illustrations" than true pictograms and it is only after the Mexico (1968) and Munich Olympics (1972;see Fig.2), that one finally arrives to signage systems as we know them today.[5]

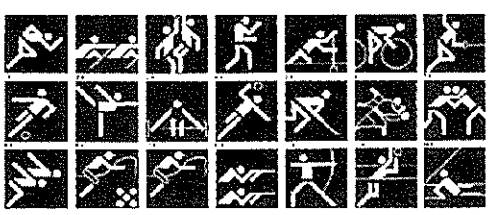


Figure 2. some of the pictograms designed by Otl Aicher for the Munich Olympics of 1972.

1.2 ideograms

Some of the so-called "pictograms" are actually signs with an extremely conventional or even arbitrary basis - for example, three triangles inside a circle meaning "nuclear shelter". Most authors, in fact, hesitate when including this last category in the group of pictograms proper. At any rate, even in the case of figurative or illustrative-type signs, one is faced with two different situations: the *literal sense* of the sign, and the *derived sense*.[6]

Examples of derived sense are the pictogram of a coat-hanger meaning "dressing room" (and not the coat-hanger itself), or the figure of a fork and a knife meaning "restaurant". Some authors prefer to call *ideograms* to this second type of signs, by the word meaning the use of figurative signs to express abstract concepts.[7] Most pictograms are in fact ideograms: another well-known case is the use of the pictogram of a man and a woman to denote "toilets"; as a pictogram is read "man and woman", as an ideogram it reads "toilets" (Fig. 3).

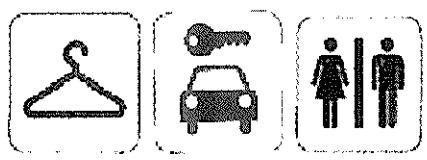


Figure 3. pictograms of a coat hanger, car and key, man and woman; the same signs read as ideograms: cloakroom; car rental; toilets.

In any of the cases, we will be always dealing with something whose interpretative rules imply pre-learning and some level conventionality - which contradicts the thesis of pictography as being an intuitive language, of universal reach, and absolutely neutral in terms of contents and meanings it transmits.

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[4] See, for example, COSTA, J., 1989, and COSTA, J., 1998; MOLES, A., 1989, pp.119-129; specifically on pictograms design, see THE AMERICAN INSTITUTE OF GRAPHIC ART, ed., 1981; HORTON, W.,1994; PIERCE, T., 1996. According to LUPTON, E.,1989 (p.147): "Logical positivism correlated the terms of a purely abstract system with units of direct experience, attempting to analyse language into a consistent and logical mirror of nature ...[on the contrary] Saussure taught that the significance of any sign is produced solely by its relations with other signs, and not by its correspondence with material objects."

[5] See MEGGS, P., 1991, pp.399-406; AICHER O., and KRAMPEN, M., 1995, p.106-7; COSTA, J., 1989. pp.54-61, 144-6, 192 and f.

[6] Or dictionary-type meaning e derivative meaning (OTA, Y., 1993. p.118).

[7] FRUTIGER, A.,1999, pp.81-83; LUPTON, E. and MILLER, A., 1999, p. 48.

Therefore we have, on one hand, that the alleged " monosemy" of the pictograms [8] is illusory – how can we know, in each case, if we are confronting a true pictogram, denoting the physical object thus represented, or an ideogram? Only context allows us to decide. In other words, no automatic link, based on some "natural" connection between a graphic sign and its referent, does exist. On the other hand, even *stricto sensu* pictograms (i.e., the ones allegedly expected to be interpreted literally) do not seek to evoke a physical, specific and unique object, but the whole group of possible objects belonging to a class. The pictogram of a table does not represent *a table*, but the class "tables"(i.e. the group of all the existent and possibly imaginable tables). Now, as Plato used to say, every item, sample, or individualized object is limited towards the concept (*eidos*, idea in Plato's terminology) it intends to illustrate. Were the idea of "table" be illustrated be means of a four-legged rectangular table, and the one-leg *ouija* table would be excluded; would the concept of "people" be illustrated (as it generally is) by an adult male, and children and women will be out.

Moreover, the same graphic sign (or extremely similar, almost identical graphic signs) can, in a same signage system, accommodate different meanings. Thus, in Fig. 4, the first three pictograms refer to "people in general", without gender specification, while the fifth refers to people of one sex only (males); in Fig. S, the first pictogram reads "gents" (men's toilets), while the third, "no entry", refers once again to people in general, i.e. both men and women. This happens because in language (written or spoken) the masculine functions as a sort of universal signifier.



Figure 4. Swiss Railways (1993), design by J. Muller-8rockman and P. Spalinger.

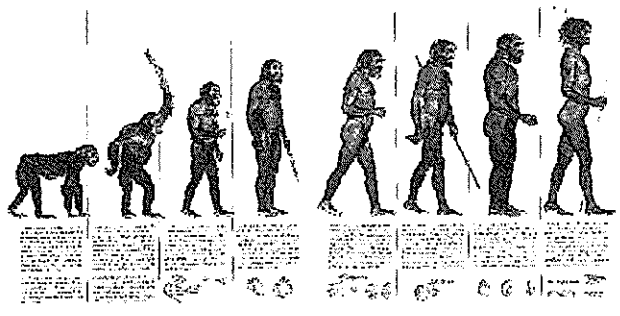


Figure 5. Expo 70, Osaka (Japan,1970), design by Eknan Kenji, GK Industrial Design Institute, Isozaki Arata e Fukuda Shigeo.

1.3 masculine and "false neuter"

In fact, comparing the relation between the two sexes to the one of two electricities, Simone de Beauvoir said that man represented "both the positive pole and the neutral"; to the woman it was left to be the negative, the Other of the man. That is why one says "Man", or "men", meaning the human beings.[9]

In the 1980s, Portuguese writer Isabel Barreno, in her study on gender discrimination in school programs and manuals, used the expression "False Neuter" (false generic)[10], to condemn this abusive use of the male form as a universal signifier for the human species.[11] (Figs. 6-8 show examples of this practice in books illustration and pictography).



Figures 6 . "The long evolutionary chain till modern man", in História do Homem [History of Man], Lisbon: Selecções do Reader's Digest, 1975, pp.12 e s.

[8] MASSIRONI, M., 1996, p.129; COSTA, J., 1989, p.141, refers " absolute monosemy". It has been frequently argued that every picture is always inherently polisemycal (see, for example, ECO, U., 1997).

[9] DE BEAUVOIR, S., 1975, pp.11 and f.

[10] In Portuguese, de word neutro can function both as a noun ("neuter") and as an adjective ("neutral").

[11] BARRENO, M., 1985.

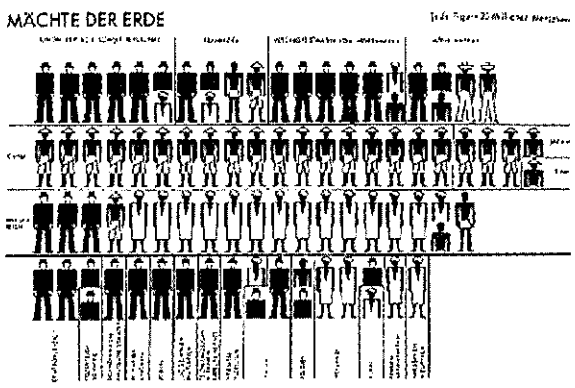


Figure 7. Isotype statistic chart showing the ethnical diversity of European empires; O. Neurath, Die Bunte Welt (Vienna, 1929).

It is a phenomenon that - so have argued several feminist authors - cannot be interpreted purely in linguistic terms, or as the result of some "natural rule" of human language, for it embraces a wider discursive practice, in a patriarchal culture that excludes or devaluates women depicting them as *deviant* towards the masculine norm.[12]

In the last few years there has been some effort for alternative forms of speech in the verbal/written language. Namely, replacing the male nouns and expressions by other, more generic terms, without gender specification: to say, for example, "people" or "the human beings" instead of "men", "humankind" instead of "mankind", etc.[13] However, in pictography, this procedure becomes difficult. Collective nouns such as "people" are too much abstract in the sense that, properly speaking, pictograms of "people" do not exist; in pictography, all there is are men and women.

Fig. 8 shows a Portuguese sign post which reads: "PEDESTRIAN: take the left side of the road". In this specific case, one can consider that the inclusion of the pictogram particularizes, reduces the universe of the message – in Portuguese, the word "pedestrian" as no gender (or rather, both genders have the same form), yet the picture shows a man. In other words, what we have here is a limitation, or disadvantage of the visual code when compared to the written word.



Figure 8. Portuguese road sign.

2. content analysis

In 2005, an extensive survey of both late-modern (1960s to 1980s) and contemporary signage systems was undertaken at the University of Aveiro. The study consisted in a contents analysis of 49 signage systems form various countries and periods: 2 808 pictograms and symbols on the whole, from which 767 showing one or more human figures were selected.[14]

This contents analysis allowed us to find a direct relation between the represented gender and its frequency. Tables I and II show the total number of pictograms that were found depicting adult males and/or females. In some cases, a pictogram would show individuals of both genders; in others, it was difficult or even impossible to determine which gender was represented – these last cases were registered as "unknown". As it can be seen, the percentage of pictograms representing women is substantially lower than the one representing men. This results from the ambiguous status of universal signifier ("false neuter"), which is attributed to the male form. The same does not happen, curiously enough, in the cases of pictograms representing children (Tables III and IV). Although the full amount of pictograms in which it is possible to identify a gender is relatively small, there is a balance between the two genders.

[12] See CAMERON, D., 1985; SPENDER, D.,1985

[13] See for example, MILLER, C. and SWIFT, K., 1981.

[14] BESSA, P., 2005.

Table I - decades of 1960 to 1980: number of pictograms depicting adults (or adults accompanied by children); frequency analysis in terms of gender.

adults	male	229
	female	61
	both gender	48
	unknown	125
	total	463

Table II - decade of 1990 to 2000.

adults	male	131
	female	26
	both gender	12
	unknown	90
	total	259

Table III - decades of 1960 to 1980: number of pictograms depicting exclusively children, and their frequency analysis in terms of gender.

children	male	8
	female	7
	both gender	7
	unknown	25
	total	47

Table IV - decade of 1990 to 2000.

children	male	1
	female	1
	both gender	2
	unknown	16
	total	20

To reinforce this phenomenon of semi-invisibility, the female gender, when represented, always configures very specific, clear-cut situations of exception towards the male/generic form. Thus, in the analysed systems, we have found evidence of stereotyping taking place at two levels. Firstly, with the constant association between women and children, or professions which deal with children. Not only one founds a much higher frequency of the female sex among children than among adults– as we have seen, the number of children depicted is almost identical in both sexes (the idea of "children" is, in fact, typically illustrated through the pictogram of both a boy and a girl, as in traffic signs), but also adult women are frequently shown accompanied by babies or small children (see Fig. 9 and also Table V). It is always women who are chosen to illustrate professions, activities and services such as "nursery", "kindergarten", "paediatrics", etc.

Table V - decades of 1960 to 2000: number of pictograms depicting adults accompanied by children; frequency analysis in terms of gender.

adults accompanied by children	male	4
	female	13
	both gender	3
	unknown	2
	total	22

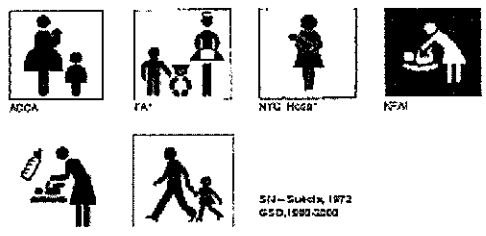


Figure 9. various pictograms showing adults accompanied by children (the last one denoting "compulsory path to pedestrians"). Although largely underrepresented in signage systems, women tend to be omnipresent went it comes to illustrate the interaction between adults and children.

But it is also possible to stumble on stereotyping when analysing the way pictograms come to reproduce traditional gender roles and professional jobs. Besides the already mentioned professions dealing with children (e.g. kindergarten educator), one finds numerous examples of the so-called "female jobs", involving the performance of more or less subordinate tasks: receptionist, flight attendant, secretary, cleaning lady (Table VI). In a general way, positions of leadership and authority (or at least like thus considered) are always illustrated by male pictograms. The profession of nurse, for example, is as feminine profession, while the profession of doctor is almost

always represented by a man[15]. The same happens with the profession of kindergarten educator vs. the profession of (high-school) teacher, with the one of secretary vs. the one of manager, etc. In those cases where the interaction client/ employee is represented, it invariably happens that the person who waits, receives or assists masculine customers is almost certainly a woman (in one case, there was a man assisting a married couple), whereas the opposite never occurs (Fig.10).

Table VI – decades of 1960 to 2000: main professions depicted in signage systems, and frequency analysis in terms of gender.

profession	male	female
doctor	10	1
nurse	-	5
police officer, customs authorities	27	-
teacher	3	-
kindergarten teacher/educator	-	6
Information services	1	2
clerk (tickets selling)	1	4
hotel receptionist	1	2
doorkeeper	4	-
cleaning lady	-	3
room service/ waiter	3	-
manager/director	3	-
secretary	-	1
sports reporter	6	-
luggage-porter	8	-
flight attendant	1	2
flight passenger, executive	25	1

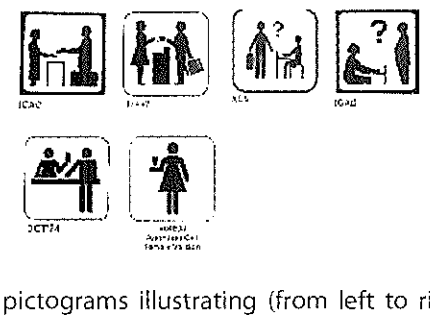


Figure 10. pictograms illustrating (from left to right): check in/tickets selling, information services, hotel reception, and flight attendant: with the exception of last one, they all show a woman assisting a male costumer.

4. conclusion

Our "mental image" of an object is not, as Neurath believed, the direct result of our perceptive experiences of natural data; it rather implies complex cultural processes, which include *clichés* transmitted by the media, education system, family and socio-cultural environment.[16] There is no harm in that. It is only when we show ourselves unable to recognize it, when we merely see the *iconicity* of pictograms, their apparent "naturalness" – it is only then that pictograms become a dangerous obstacle in our understanding of the world that surrounds us.

Comparison between sign systems of different periods allowed us to realize that signage pictography is, in its essence, conservative –both at stylistic and iconographical level. This is partly due to characteristics of the *medium* itself. By a technical necessity (to make the message simple), pictography is more or less condemned to produce and reproduce stereotypes, to provide us with a caricature of reality.[17] Abrupt change in the

[15] There was only one case found of a female doctor: the hospital signage system of the Industrial Design Center, Indian Institute of Technology, Bombaim (design Ravi Poovaiah, 2002). This signage system has different symbols for (male) "doctor" and "female doctor", but also for "men's queue", and "women's queue", with the correspondent distinction between male and female patients.

[16] See LUPTON, E. and MILLER, A., 1999, p.63, for a criticism of ARNHEIM, R., 1986, pp.99-102; see also ECO, U., 1997, p.117 and ff.

[17] Pictograms design imply a whole process of formal simplification, even geometrisation; see AICHER O., and KRAMPEN, M., 1995, p.101; COSTA, J., 1989. pp. 142-6. For textual reference to "caricature" see DEWAR, R., 1999, p.298; Dewar refers to the advantages of "exaggeration of the useful and essential elements of an object relevant to its identification". He also recognizes that "it is often adequate or preferable, to present a caricature" (ibid., p.290). COSTA, J., 1989, p.141, also mentions caricatura.

symbols design may also result in confusion (or even danger, as in traffic signs) and loss of trust on the side of the user. Does this mean that all that is left for signage designers is to carry on their job, playing with *stereo*-types (that is, "solid, fixed characters")? Or is it possible to modify this situation?

In the study we made, it was possible to find some improvement in pictograms from the1990-2000s, both in terms of women's "invisibility" and gender stereotyping, due to the introduction of innovative solutions. It is our conviction, however, that some of the problems raised by signage and pictographic languages are, in fact, impossible to solve.



Figure 11. various examples of alternative pictograms. From left to right: "paediatrics", "no strollers", "no entry" (the last sign, however, could be misleading: it also reads as "men only").

In Fig. 11 it was reasonably easy to re-design the first and third pictograms, in order to make them less sexist. However, it was no longer possible, for example, to modify the fifth one ("no entry") without some confusion having occurred. If one intended to prevent the "false neuter" problem and feminine invisibility, the resulting sign becomes somewhat ambiguous, introducing a restrictive meaning which the original did not have. It is not very probable that the new sign is interpreted as blocking the entrance to people in general ("no entry"), but as blocking it *exclusively to women* ("men only").

That is to say, and I will finish, pictography has obvious limitations (as well as advantages) when compared to the written language. What is important is to be aware of these facts, instead of idealizing visual language as if it was a sort of magical solution to all communicational problems.

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CRAZY IDEAS OR CREATIVE PROBES: PRESENTING CRITICAL ARTEFACTS TO STAKEHOLDERS TO DEVELOP INNOVATIVE PRODUCT IDEAS

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Abstract

A number of design practices derive from and develop the notion of critical theory. Notable developers of such "critical design practices" are Dunne & Raby with "critical design", Sengers and colleagues at Cornell University's Culturally Embedded Computing Group with "reflective design", and Agre with "critical technical practice" within artificial intelligence research. And there are an increasing number of designers who, whilst not specifically explicating their theoretical ancestry, include critical elements in their products.

The reflection afforded by the products of critical design is generally seen as its endpoint. However I have used this reflection instrumentally within human-centred design activities. "Critical artefacts" have proved more useful as tools than direct questioning techniques; in particular as a way of enabling stakeholders to engage with novel situations and consequently engage in creative thinking about future possibilities.

This paper begins with a review of critical design practices. Two case studies are then detailed demonstrating my approach. A discussion of the commonalities and differences between critical design practices follows noting their relationship to critical social theory and the relationship of my work to them. Finally further research to develop generalisable methods is outlined.

Critical Design Practices

Calhoun has proposed that 'Critical social theory makes the very givenness of the world the object of exploration and analysis' (1995:8). This view questions that there is only one possible way the social world can exist and be theorised, arguing that this possibility reflects numerous historical and cultural influences. By recognising alternative possibilities and critiquing existing social theories it reveals implications for social change. Critical design practices are my umbrella term for a set of related approaches that aim for similar ends via the practice of design (in its widest sense) – by producing artefacts which afford critical reflection.

Critical design practitioners point to the underlying values and assumptions of design practices (and design research practices) and suggest problems in leaving them un-critiqued.

Dunne & Raby are concerned with the unrecognised ideological nature of design. In Hertzian Tales (1999) Dunne criticises the manner in which electronic products are designed. He argues that the products of design embody the ideologies that created them (they reflect the values of their designers and manufacturers) and that the nature of these ideologies makes it undesirable for products' users to accept them unthinkingly. In Design Noir (2001) Dunne & Raby develop this idea further, categorising the ideological nature of design as either affirmative or critical. Affirmative design reinforces the current situation by leaving the ideologies unchallenged and conforming to cultural, social and technical expectation. Critical design rejects the current situation as the only possibility, and provides a critique in the form of design outputs embodying alternative values and ideologies.

Dunne (1999) proposes specific examples of the ideologies inherent in electronic products and the consequences of their adoption: That design generally serves a culture of consumption, leading to industrial design maintaining a society of passive consumers; That design outputs often portray didactic or utopian situations with discrepancies between them and the everyday situations they are actually

encountered in; That approaches such as Human Factors are limited, producing "usable" products that 'will not confuse or disappoint'. Dunne infers there are benefits to products doing more – in confounding expectations. He offers that affordances (after Donald Norman) are not fixed aspects of products to be understood; rather they are individually, socially and culturally dynamic. This leads to a form of design which is about more than just needs-satisfaction and ease of use.

Dunne & Raby (2001) suggest industrial design's role in the design of electronic products is casting designers as mere semioticians, as illustrated by the example of the Sony Walkman.[1] The original Walkman created a new kind of experience (mobile, personal music) and redefined the role of technology in public spaces.[2] The numerous subsequent designs of "walkmans" have not caused such fundamental changes, instead re-presenting the same product purpose in slightly different forms. Dunne & Raby feel that the majority of electronic product design suffers from this problem – dealing in the signs to communicate what a product does, rather than devising new product roles and purposes. They refer to this as one "genre" of product design, where 'the emphasis is on easy pleasure and conformist values' and which 'reinforces the status quo rather than challenging it'.

Sengers et al. specifically focus on human computer interaction (HCI) practices, asking 'what values, attitudes, and ways of looking at the world are we unconsciously building into our technology, and what are their effects?' (Sengers et al. 2005:49). They note that there are gaps in design and research methods caused by the unconscious adoption of the values within them, for example a focus on cognition to the detriment of emotional aspects, and the dominance of work-centred approaches 'risking making all of life like work'. They suggest that 'critical reflection identified particular unconscious assumptions in HCI that might result in negative impacts on our quality of life' (p49).

Sengers et al. are interested in critical reflection on practice within the practice itself (by researchers and designers), and they argue that 'critical reflection *itself*, can and should be a core principle of technology design for identifying blind spots and opening new design spaces' (p. 49, their italics). Critical reflection is not just for opening up approaches for designers, 'technology design practices should support *both* designers *and* users in ongoing critical reflection about technology and its relationship to human life' (p. 50, their italics). In their reflective design strategies they suggest building technology as a probe to explore social practices and the practices of technology design and evaluation.

Agre argues that the design of Artificial Intelligence (AI) systems is influenced and limited by the manner in which it is thought about – how it is discussed and how this is translated via the technical construction of its systems (1997). At his time of writing, he suggested that AI systems reflected limited concepts of what intelligence is and how we interact with our environment as intelligent beings. Recognising this, he argues, is therefore important in developing a more holistic conceptualisation and design of AI systems. Although discussing AI in particular, Agre notes that there could be a benefit in including such critically reflective elements in all technical practices: 'What is needed [..] is a critical technical practice – a technical practice for which critical reflection upon the practice is part of the practice itself' (pxii).

Agre calls the influencing aspects 'substantive metaphors', showing how they are expressed by the language, terminology and attendant imagery commonly associated with particular disciplines. These metaphors 'define a hierarchical opposition between central and marginal cases, that is, between those phenomena that are readily assimilated to the metaphor and those that are not' (p. 45). So reasoning based on any such metaphors will be unable to adequately account for the marginal cases. Agre sees the problem with existing technical practices is that they see inadequately explained phenomena as further problems to be solved, not as limitations of the metaphorical underpinning of the practice itself.

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[1] Referring to designers as makers and purveyors of "signs" rather than those involved in the study of signs.

[2] Dunne & Raby make great claims of the Walkman, '[offering] people a new kind of relationship to urban space' (p45), as being exemplar of what the design of electronic products can be. However to infer that this radical new social application of technology was somehow designed is problematic. There are several stories as to how the Walkman was devised, but none tell of Sony's desire to affect social change. The effects it produced were incidental and not consciously engineered.

Agre suggests that AI has suffered from being organised around a substantive metaphor he terms 'mentalism', derived from cognitive science, where 'the mind is a space with an inside, an outside, a boundary, and contents'. Phenomena become either central or marginal according to whether they can be adequately explained by this metaphor. For example detached "cognition" and internalised "thinking" are central to this metaphor; complex interactions between individuals and the "outside" world are marginal, less easily described by the metaphor. The presence of a central/marginal divide highlights the shortcomings of substantive metaphors and the need to recognise and critically reflect on their influence on technical practice. To do so, Agre suggests focussing on the marginal phenomena to create new substantive metaphors – in this example 'interactionism'.

The exhibition 'Strangely Familiar: Design and Everyday Life' included several products of critical design practice including the work of Dunne & Raby. In his introductory essay to the exhibition, Blauvelt suggests 'design is both invisible and conspicuous, familiar and strange' (2003:14). He argues that the products of design surround us, but for most people the practices of design are unknown: '[Design outputs] tend to conceal rather than reveal the process of their making' (p. 14).

Blauvelt goes on to unpick some of the "invisible" aspects of design. He suggests the 'relative invisibility of design is also a matter of perceptual survival', if new products didn't merge easily into our everyday lives, life would become "an ever-changing visual cacophony' (p. 15).

Whilst Dunne & Raby, Sengers and Agre are conscious of and explicate the theoretical drivers of their work, other practitioners operate in a more intuitive manner. There is a growing group of designers who direct some of their work towards satirising their own profession, appreciating a need to challenge design practice and products' roles within consumer society. The provocative and challenging concepts they produce could be comfortably described as critical design, but perhaps the thinking behind them and their ultimate aim is less driven by a conscious critique and exposition of contemporary values and more a desire to "poke fun" at the products of a rampant consumer society.

For example the Human Beans partnership of two design professionals state their manifesto as: 'We make fictional products by hacking commercial culture [..] Our aim is to challenge assumptions and point in new directions' (2006). Several of their 'fictional products' seem to fit the definition of critical design: "Mr Germy" is a bacteria-infused chewing toy to boost infants' immune systems; in buying "Live Cigarettes" you collect points for the treatment of smoking-related diseases; "Mute" is a hearing aid for the hearing able. These product concepts afford critical reflection on ideologies based around hygiene, healthy living and the roles of assistive technology.

Human Beans are interested the experiences surrounding products in contemporary society - how we use products, how products are marketed to us, the identities and aspirations we develop around products. As designers working within design and marketing they are experienced in the tactics used to influence these experiences. Their approach is a more "designerly" intuitive application and satire of these tactics rather than a philosophically-informed and directed critique. The manner in which Human Beans present their fictional products illustrates this difference. Whereas Dunne & Raby concentrate on communicating the functional purpose of their concepts, Human Beans go beyond this to communicating the numerous ways of encountering their concepts as "real" products. Their concepts are presented via realistic packaging, advertising and other promotional materials (figure 1). Although their theoretical position may be less defined, Human Beans concepts' power is in their believability, which has been achieved through the intuitive knowledge of practicing designers.

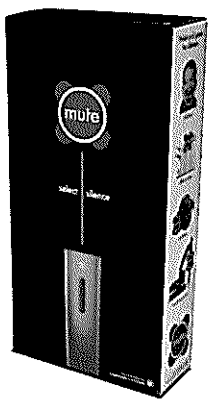


Figure 1. Mute (Photo: Human Beans).

The work of the designers who belong to the Droog Design collective could be seen as pioneers of "satirical design". Droog Design grew from an exhibition curated by Dutchmen Renny Ramakers and Gijs Bakker in 1993. The Droog designers are united by their "dry" mentality (droog meaning dry in Dutch). "Dry' as that essentially Dutch inclination to 'do normal' and at the same time critically investigate what you're doing and the way you do it.' '[Droog designers] need to share a mentality that looks at design as both functional statement and conceptual discourse' (Droog Design 2007). But again the emphasis of Droog products is of presenting artefacts that could be (and often are) marketed and sold.

Practices which apply critical reflection for similar ends to critical design have also been developed in other areas, for example Fuller has written about the idea of "critical software" (2003). Fuller describes critical software as 'pieces of software designed explicitly to pull the rug from underneath normalised understandings of software'. They are intended to reveal and afford reflection on the underlying facets of software in both its design and use.

In my work I have used critical reflection more instrumentally as part of human-centred design activities. Two case studies are now presented to illustrate this approach.

Case Study 1: Digital Photograph Collections

This project explored how stakeholders could be involved in the development of new product ideas, in particular new ways of using digital photograph collections.

Several ideas provided the impetus for the project. Others have recognised that the increasing number of digital photographs taken is creating an information management problem for many people, particularly if those photographs are stored and organised on a personal computer (Weinberger 2004). The development of new technologies such as electronic ink displays (e.g. E-Ink 2004) and computing paradigms such as ubiquitous computing (Weiser 1991) means that the organisation and display of images need not be limited to established paradigms of paper prints or a computer monitor as represented by the introduction of electronic photograph frames e.g. (Philips 2005). Consequently there was an opportunity to develop more novel digital photograph products. The challenge was to ensure that these product ideas were driven by a rich understanding of stakeholder needs rather than by technology alone.

The needs of families with young children and older people were chosen to be investigated as both these broad categories of people make extensive use of photographs, specifically the idea of so-called "family album" photographs. Representatives of these two groups took part in the research activities.

An initial approach was to use low fidelity prototypes (after Ehn & Kyng 1991) with stakeholders to develop an understanding of their needs. In conducting these activities a common limitation became apparent. Stakeholders had difficulty responding usefully to the prototypes as the novel application of technologies they illustrated was unfamiliar. People find it hard to articulate what they need if they don't know what they can have.

Stakeholders were briefed about the potential of electronic ink displays and wirelessly networked devices (described as "magic paper" to remove potentially confusing technical jargon) and then encouraged to engage in creative thinking about future possibilities. To enable this, a variety of roughly-made cardboard frames, coloured label "buttons", and blue foam and plasticine "controls" were provided for participants to manipulate. However participants generally responded by devising systems based on their existing experiences. A participant from the families with young children group was observed devising a system where a moving pointer selected images from textual lists displayed on a screen, very clearly derived from her experience of using web browsers. A couple from the older people group rejected the prototypes altogether preferring traditional photograph albums, reluctantly offering that a numeric keypad could be added to select the date range of the photographs.

Prior to this, I had found that the use of more direct questioning strategies such as questionnaires and interviews had much the same limitations. Questioning strategies, whether they attend to responses to direct questions or responses to prototypes, have the same limitation – the responses are dominated by the experiences of the questioned. Novel products create new, unfamiliar experiences which questioning strategies have difficulty exploring. So to develop a rich understanding

of stakeholder needs to inform the development of novel product ideas, an alternative approach to questioning was required.

Having chosen managing digital photographs as a vehicle for the research, I had set out to discover how stakeholders might best explore what forms of products could be developed, and the wants, needs and values they should reflect. In order for these product ideas to be novel they needed to go beyond familiar ideas of the use of photographs. Critical design offered a way to suggest alternative aspects and afford critical reflection on them.

A set of six critical artefacts were designed and presented to two workshop groups of three participants (combining representatives of the older people and families with young children groups) as valid design proposals which they were invited to critique. The artefacts were presented via scenarios told using "photo essays".

For example the Forget Me Not Frame (figure 2.) is a provocative design concept devised to explore issues of social etiquette and dynamic display of photographs. The frame has a lever on its side that fades out the photograph, the lever also slowly descends over time and needs continually pulling up to prevent the photograph disappearing. The frame also communicates with other digital photograph devices. For example in the photo essay: my mother is on the phone to me; we have an argument and she slams the phone down; then walks over to the Forget Me Not Frame and pushes the lever down; this "disappears" the picture in the frame; but also any other photos of me displayed elsewhere.

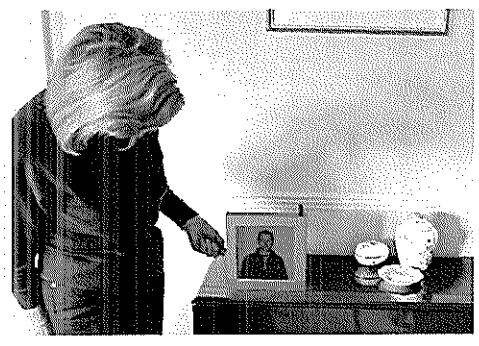


Figure 2. Forget Me Not Frame.

The artefact scenarios prompted illuminating discussions from the participants, which I videotaped to enable me to participate as designer and later step back as detached researcher observing the interactions that took place. Although participants could not imagine wanting the products, they did engage with the ideas and concepts expressed through them. For example the Forget Me Not Frame prompted that 'the whole concept of wiping someone out [is] horrible', but participants went on to discuss the effects of changing family relationships and how being able to "edit out" particular photographs could be beneficial – i.e. with an increasing number of relationships ending in separation and divorce, it could be socially tactful to remove certain photographs on display during family visits.

The workshop discussions informed the ongoing design exercise, creating a rich understanding of stakeholder needs relating to these unfamiliar situations. This was expressed as explicit themes to be considered in the design of digital photograph products. For example the emotional connection people have with personal photographs means that their use and display should be "open-ended" – people dislike such emotive material being automated or controlled.

The themes were taken a step further and expressed via another series of artefacts. These "way marker" artefacts had a greater balance of practicality and novelty than the critical artefacts and indicated potential areas for new product development. For example the Picture Grabber way marker (figure 3.) developed the idea of tactfully changing photographs with a physical device to "drag and drop" images.

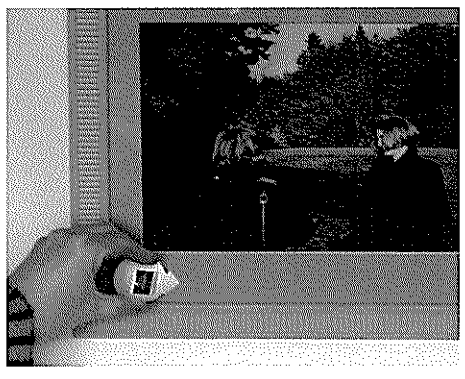


Figure 3. Picture Grabber.

This project showed that there was value in using critically designed artefacts within this design activity and that the approach might be usefully applied to other human-centred design contexts.

Case Study 2: Design and Ageing in the Home

This project fits within a broad enquiry theme with colleagues at Sheffield Hallam University into ageing, design and well being. The project was intended as a scoping study to inform future work in this area. It aimed to explore how domestic environments could adapt for ageing population needs whilst remaining attractive and satisfying places to be. It also provided another human-centred design activity in which to apply the instrumental use of critical artefacts.

People are living longer and older people comprise an increasing proportion of the population. The United Nations reported that by 2050, 20% of us will be 60 years or older and 'the older population itself is ageing. The oldest old (80 years or older) is the fastest growing segment of the older population' (2003).

There are numerous research projects into the effects of ageing, and several design projects developing products and environments for an ageing population. However these often focus on the 'medical model' of appreciating stakeholders' needs (Newell 2003) – treating the "symptoms" of ageing with design "cures". Design has the potential to reconcile older people's needs and aspirations – products could be useful and desirable to all in addition to alleviating the effects of ageing. We also recognise the opportunity to use design as a way of exploring the context itself – contributing to a rich understanding of the ageing population in addition to designing for them.

Eight members of the Sheffield branch of the University of Third Age (U3A) participated in the study, aged between 60 and 90 and all living independently in Sheffield. The study consisted of three phases of activity surrounding three stakeholder workshops lasting around one hour.

I described the series of workshops to participants as an ongoing "dialogue". In the first workshop participants would be talking to me, the primary aim being to gain some "inspiration" for the critical artefacts I would create for later workshops. Participants were asked to bring in examples of (or images of) two artefacts from their "living rooms" that were a favourite and a nuisance (but necessary), which then formed the starting point for discussion.

In the second workshop I would be "talking back" to the participants via a set of critical artefacts; with the aim of suggesting some new situations for reflection and discussion. Five artefacts were presented to the participants who were told to see treat them as "conversation starters".

One of the themes that emerged from the first workshop was the problem of "clutter". Participants felt overwhelmed by a miscellany of items that seem to be an unavoidable part of everyday life: bills, letters, junk mail, newspapers and magazines. The *Prioritiser* concept was developed in response (figure 4.). All incoming post is placed on a shelf in the *Prioritiser* to be dealt with in future, most important items at the top. The shelves slowly descend and, when reaching the bottom, drop their contents into a paper shredder. The owner of the *Prioritiser* is given a certificate entitling them to shred any post that does not ensure their attention before it reaches the shredder. Participants related a common anxiety of needing to deal with their "clutter", the *Prioritiser* encouraged them to imagine a situation where this anxiety is challenged.

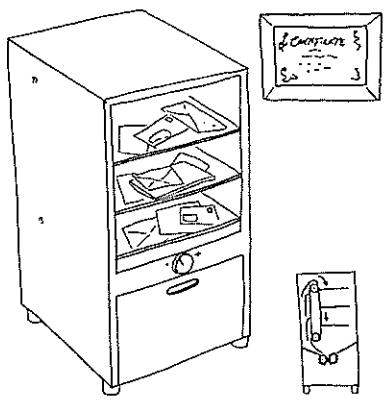


Figure 4. Prioritiser.

Another theme which emerged in the first workshop was the conflict between personal independence and community

dependence. Participants felt that the effects of ageing meant they were increasingly dependant on others, but this dependence could be detrimental to their well being as their sense of personal independence was eroded. The decline of local feelings of community exacerbates the problem – participants were becoming less likely to seek the help of their neighbours. The CommuniTools concept was developed in response (figure 5.). A block of apartments has a new type of ceiling light for easy, self-maintenance. The light has a tool to lower it, a tool to open the light fitting, and a tool to remove and replace the light bulb. However there is only one tool per apartment and none has all the tools.

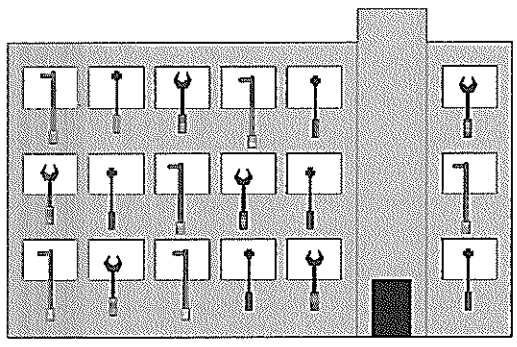


Figure 5. CommuniTools

This artefact prompted discussion of the value of social interaction for mental well being – combating loneliness, maintaining a sense of personal worth and developing support networks. However concern was expressed at the idea of having behaviour "designed" (to force situations for social interaction).

In the third workshop I presented a second set of critical artefacts to participants, influenced by the discussions that took place during the second workshop. The aim being to explore some of the areas outlined in the second workshop in greater depth. Three artefacts were presented to the participants, again as "conversation starters", additionally they were told the artefacts demonstrated 'what I think you think...'.

For example the response to the *CommuniTools* concept suggested it could be better to design social interaction "by subterfuge"' – i.e. in a less explicit manner, as a by-product of design rather than the main objective. This led to another concept CommuniCycle (figure 6.). The main perceived objective is to replace the British system of numerous wheeled bins for collecting household waste (with consequent space and collection implications) with a mini-recycling station for every few homes, thereby creating numerous opportunities for social encounters with your neighbours as a by-product.

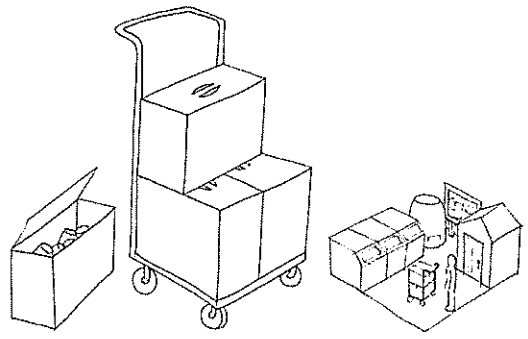


Figure 6. CommuniCycle

Again this project showed the usefulness of presenting critical artefacts to stakeholders within a design process. The study also suggested themes to be explored in further work, some of which were expressed as "way marker" concepts.

Discussion

My research is concerned with the implications of critical design practice rather than critical social theory. But it is useful to note how critical design practices can be mapped against, for example, Calhoun's description of critical social theory. This comparison highlights a common position that they all hold, although their specific interpretations vary, relating to the traits of critical social theory as described by Calhoun:

- The "way things are" is not the only possibility and reflects underlying, often hidden, factors;
- The unthinking acceptance of these factors causes problems; so
- There is a need to recognise and critically reflect on these factors; and
- There is a need to explore other possibilities; and
- Thereby affect an improvement in the "way things are".

So the "way things are" is the design and use/consumption of electronic products for Dunne & Raby, the design and research practices of HCI systems for Sengers, and the design of AI systems for Agre. Each cite underlying factors: the ideological nature of design (Dunne & Raby), HCI's focus on cognition and work (Sengers) and the limitations of "substantive metaphors" (Agre). Each note problems in the unthinking acceptance of these factors: the continuation of passive consumption and the production of "unpoetic" products (Dunne & Raby), HCI systems' negative impacts on quality of life due to the "gaps in practice" (Sengers), and the development of AI systems' behaviour that does not adequately reflect real world phenomena (Agre).And each has their own way of exploring other possibilities: Dunne & Raby create "design noir", "para-functional" or user-unfriendly products, products as value fictions with poetic dimensions; Sengers builds technologies as probes and provides for open interpretation; Agre creates new substantive metaphors for AI by placing at the centre phenomena that were previously marginalised; Blauvelt suggests designers use aspects of the everyday to make the familiar strange; and "satirical designers" make believable products and promotional material with subversive content.

In all the above points, the practitioners may differ on the details but they are broadly doing similar things. It is their approaches to the improvement in the "way things are", that varies greatly - where the improvement is afforded, how critical reflection is used to make this improvement, and consequently the roles of the artefacts produced from their practice. In this last respect my work differs and develops from these existing practices.

All critical design practitioners are attempting in some way to make their respective practices more "effective" - whether it is a more holistic appreciation of practices' contexts or a greater public awareness of the impacts of practices. The difference is whether this improvement is in the practitioners' own practice or their practice in general and/or the social world it affects. Is criticality used *within* their practice or produced *outside* their practice? Critical design and the work of satirical designers are about putting critical artefacts "out into the world". They aim to improve the practice of design in general by affording critical reflection in others. Critical technical practice and reflective design aim to improve their own practice by affording critical reflection within it. My approach is closer to the latter situation - using critical reflection instrumentally within a design process.

Alongside this are the differences in the roles of the products of critical design practices. The role of Dunne & Raby's concepts (and, less explicitly, those of satirical designers) is to afford experiences of critical reflection. In this respect they are perhaps closer to art objects than designed products – they are intended to make us think. But it is rather too simplistic to classify these products as art rather than design. Most designers would be happy and familiar with designing certain of critical design's aspects into their work (affecting social change, countering passive consumption etc.). So perhaps Dunne & Raby are offering a new type of product, with a new way of consumption – experiences for rent? Either way they do not reflect the usual function of design – "mainstream design" as Dunne refers to it.

A definition of mainstream design could be: making things to afford an improvement in our experiences of our environment. Dunne & Raby seem to be saying that there is little further work to be done improving things in this respect, so design should be making things to afford *reflection on* our experiences of our environment. Mainstream design is primarily about offering answers, Dunne & Raby suggest that design should now be about asking questions.

Agre's critical technical practice produces AI systems that better represent real world phenomena. Sengers' reflective design produces HCI systems that offer a more holistic satisfaction of needs and afford some critical reflection of their use. In this respect they are both closer to what Dunne & Raby would term mainstream design. They are primarily about producing answers.

The approach is also closer to the idea of mainstream design. The critical artefacts produced serve the role of "probes" within human-centred design activity - tools for exploring problem contexts and generating needs-focussed product ideas. The critical artefacts are instrumental in developing better "answers".

Although the idea of critical theory provides a departure point for the practices described above, it is less useful for my own

work. More relevant here is the work of Ehn & Kyng (1991) who demonstrated a process that engendered new thinking in product development. Their use of low fidelity prototypes allowed stakeholders to engage with a novel situation in a manner that revealed knowledge about their working practice and how the design of novel systems might support it. Specifically a newspaper editorial team's engagement with "cardboard computers" informed the design of computer-based publishing systems before they were being used in the industry; it allowed them to engage with a novel situation in a way that usefully informed design thinking (see also Rust 2004:78). My use of critical artefacts is in a similar vein.

Gaver & Martin (2000) discuss an application of critical design within design practice for more instrumental ends. They produced a "workbook" illustrating twenty 'conceptual design proposals'. These concepts express alternate values to 'functionality and usefulness' for digital devices, thereby suggesting that digital devices might embody alternative values but also affording reflection that they already embody a restricted set of values. They function as critical design, affording critical reflection.

Gaver & Martin presented the workbook concepts to their collaborators as inspiration, to 'encourage people to imagine living with them, raising many of the sorts of reactions that might be encountered if they actually existed' (p215). They describe the concepts as '*placeholders*, occupying points in the design space without necessarily being the best devices to populate it' (p216, their italics). So the concepts provided starting points for exploring these design spaces, defining the contexts for new digital devices. In concluding Gaver & Martin suggest critical design practices: 'might also form the basis for new kinds of user studies [..] concept proposals could introduce speculative new ideas to potential users in such a way as to evoke general insights into their attitudes as well as more specific reactions' (p216). This is the territory my work is exploring.

Further Research

The scoping study described above informs a one year project extending the investigation. This new project includes a more diverse group of stakeholders associated with older people: active older people, frail older people, their carers and the "future old" – middle-aged people whose aspirations future products will need to satisfy. This larger study provides the context for developing a generalisable methodology for using critical artefacts instrumentally within a design process.

The above case studies both flagged potential conflicts between the roles of the designer as workshop participant and the designer as "ethnographic-like" observer. Ethnographies attempt to document a situation without changing it. However my approach involves simultaneously manipulating a situation, participating in it and observing it (as is often the case in designers' activities in research). There is also a third level in which I am operating – as a researcher developing a methodology. The wider project will provide evidence of the methods' real world effects, from which the validity of such participation-observation activities could be reasoned. It also provides an opportunity for others to take the role of designer-participant and designer-observer and increase the breadth of perspectives used to develop the methodology.

Conclusions

There is a number of emerging "critical design practices" that develop the idea of critical theory into design activity - using critical reflection on their practices to make them more "effective". For Dunne & Raby and other proponents of critical design such as "satirical designers" the critical reflection is the endpoint. Their artefacts afford critical reflection in their audiences, and it is hoped that by contributing to the wider public discourse beneficial change might occur. Other practices use critical reflection in a more instrumental way. In Sengers' reflective design and Agre's critical technical practice it is used by the practitioners themselves to ensure a more holistic, comprehensive appreciation of their design contexts. Critical aspects are used within these practices and they are less evident in their end products – unlike critical artefacts.

Through my research I am developing another possibility of critical design practice – that there is an opportunity to use critical artefacts, not simply as agents for critical reflection, but more instrumentally within human-centred design activity as "creative probes" to explore novel problem contexts. In this respect my work is closer to the low-fidelity prototyping ideas of Ehn & Kyng than the critical theory cited by other practitioners.

The two case studies presented here demonstrate that there is value in using critical artefacts in this way, although there is ongoing work remaining to develop generalisable methods to exploit this principle.

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COMPETING WITH GLOBAL PLAYERS: THE OTHER SIDE OF THE COIN

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Abstract

In the so-called developing countries, the idea of free market and integration of national economy with the global economy is often promoted as an indicator of modernity, prosperity, and increased well being. After lowering their protectionist barriers, these countries have found themselves in a disadvantaged position as the influx of global corporations has put into danger the survival of local companies. Without the resources to develop new technologies, and with little experience to work under dense competition, many local companies had no other choice but to close their doors, to sell or to become a subordinate partner of a transnational corporation. However, although small in number, there are local firms which are successful in protecting their domestic markets and even expanding abroad. Through analysis of cases studies of Turkish companies that have been successful in competing against big global players, this paper focuses on (1) what key competitive assets these companies utilize, (2) what the role of design is, and (3) how certain design skills and knowledge could be used to achieve sustainable competition at home market and expand to other markets.

Introduction

Globalization in business is often referred to as organizing all or part of business activities across borders for the purpose of providing companies with access to larger markets, reducing labor costs, getting benefits from scale economies, and facilitating proximity to key resources. Thus, the idea of globalization has become a mantra and a key guiding principle in long-term growth strategies of several companies (e.g., Holt, Quelch, and Taylor, 2004; Levitt, 1983; Ohmae, 1990, 1995; Yip, 1992). As some countries lowered their protectionist barriers and joined the bandwagon of open economy, global companies[1] seized the opportunity to explore these new markets. For consumers, this often meant choices they never had before, but for local companies it became a threat they had never faced before.

Theoretically speaking, the opportunities are reciprocal. Local companies too can benefit from prosperity promised by globalization. However, having no experience of competition, rapid innovation, financial resources for technological or marketing investment, or marketing experience needed to expand abroad, it is a major challenge for local companies to compete with the global players even at home. In fact, it is argued that reduced trade and investment barriers, instead of providing equal opportunities, increase the asymmetry between groups that can cross international borders and those that cannot (Rodrik, 1997). Hannerz's (1991) center-periphery model, for example, states that the flow of goods and marketing messages occurs from strong industrial centers to peripheral and less industrialized ones. Dependence theory (e.g., Seers, 1981) emphasizes the difficulties for breaking this pattern and the limited opportunities local companies in the periphery have for becoming a global player. Bonsiepe (1991, 1999) blames such approaches for focusing too much on factors external to the company and ignoring the competitive

[1] For purposes of simplification, I use the term global companies here as an umbrella term to cover companies following multinational, transnational, international and global strategies. For distinctions among and comparison of different company strategies, see Bartlett and Ghoshal (1998).

advantage, growth and innovation possibilities that could be brought by design and technology. He argues that design in particular has an important role to play in the development of peripheral countries. Today, although not many, cases that challenge dependency views exist. For example, the success of South Korean companies such as Samsung is largely attributed to the innovative and effective use of design skills and knowledge on a corporate wide level (Dong-Sung, 2004; Hardy and Chung, 2000; Rocks and Ihlwan, 2004). It is the purpose of this paper to analyze such success stories in which design contributed to local companies' success against well established global players. The paper first reviews the unique challenges and opportunities for local companies in the so-called developing countries. Next, the role of design in creating global competitive advantage is examined. Through analyses of case studies of Turkish companies that have been successful in competing against big global players, the paper then discusses the competitive assets utilized by these companies, and the role design plays in securing competitive position at home market and expanding internationally. Finally, directions for future research and practical implications are discussed giving particular emphasis on how particular success factors could be scaled and used.

Local Companies in Global Markets

The debate on globalization of business offers little guidance to local companies because it is biased, mostly reflecting the perspective of global companies. It is primarily concerned with how established western companies can further extend their operations to new markets and manage internationally. For example, some of the main issues include (1) the question of whether converging lifestyles and desire for the same global products exist (e.g., Alden, Steenkamp, and Batra, 2006; Guillen, 2001a, 2001b; Levitt, 1983; Ohmae, 1995, Zhou and Belk, 2004); (2) barriers to and problems of entry to new markets (e.g., Yip, 1992); (3) how to cope with the realities of the new markets more effectively (e.g., Bartlett and Goshal, 1998; Douglas and Craig, 1989; Hamel and Prahalad, 1985; Kashani, 1989;) and (4) how to adopt an appropriate marketing and product strategy which will help to successfully penetrate into new markets (Calantone et al., 2004; Cavusgil, Zou and Naidu, 1993; Quelch and Hoff, 1986; Özsomer and Simonin, 2004; Takeuchi and Porter, 1986). That said, what works for western global companies may not always work for companies in developing countries as each operates in a different setting which poses a unique set of challenges. Even to stand-up the competition at home, local companies have to overcome several disadvantages such as political and economic instabilities, technological dependency on global and multinational companies, manufacturing and assembly oriented industrial system and consumer bias. For example, according to McKinsey Company's research, Turkey utilizes only a little more than half of its potential productivity level due to the economic volatility (Baser, Farrell, and Meen, 2003). High interest rates, high inflation, and high government debt partially caused by short lived and weak governments create an extremely unstable situation for businesses. In such an environment, many companies direct their effort towards OEM production which is perceived to be low risk. In the Turkish case, proximity to major markets, cheap skilled workforce, and policies encouraging foreign direct investment make OEM agreements even more desirable. The short history of competitive market structure and the absence of an established R&D base have further encouraged OEM orientation and cost based competition. Also, in contrast to imported products, consumers perceive local products as low quality (Ger, 1992, 1999).

Despite these major disadvantages, few studies on local businesses demonstrate that, once local companies break out the *mindset* that they could never compete successfully on the global stage, they can actually develop strategies reverse their position (Bartlett and Ghoshal, 2000; Dawar and Frost, 1999; Khanna and Palepu, 2006). For example, Dawar and Frost (1999) argue, in their analysis of Indian denim producer Arvind Mills, that local companies that have a good understanding of the conditions of their industry and their own assets can effectively defend their markets against global companies. In fact, it is even argued that local companies possess unique opportunities and advantages over their global counterparts. One such key advantage is their understanding of local *capabilities and resources*, such as the knowledge of locally available materials, culture-specific work models, local infrastructure, established service, supplier and distribution networks, etc. (Dawar and Frost, 1999; Khanna and Palepu, 2006). Dawar and Frost's Bajaj motor case shows how an established service network and knowledge of local infrastructure could turn out to be a competitive asset. When Honda entered the Indian Market,

it offered technologically and aesthetically more advanced models than the local ones. However, the local motorcycle manufacturer Bajaj was able to keep its leading position in the market due to its widely accessible distribution system and omnipresent service network of roadside mechanics which fit well with the Indian way of doing business. Honda, on the other hand, was sold mostly through outlets in major cities and reached only a very small segment.

Deep cultural and market knowledge is another strength that local companies could build on (Ger, 1999; Khanna and Palepu, 2006). According to Ger (1999), local companies could successfully compete through building a *cultural capital*. She borrows the term from Bourdieu (1977, 1984), where it originally refers to the creation of a potential capacity to produce economic or social profits through an individual's accumulation of knowledge, skills, education, taste, etc. In a similar vein, "[t]he intrinsic advantage retained by local companies is their local identity and culture" (Ger, 1999: 65). This could then be further developed to enable these firms to create economic value with local strategies. Although recent design and business research advises global companies to acquire local knowledge, tailor their offerings, and innovate based on local needs (e.g., Ghemawat, 2005; Greenwalt and Kahn, 2005), global companies are reluctant to localize since the associated effort and costs are high, and the size of each individual market is perceived as being small (Applbaum, 2000; Calantone et al., 2004). Therefore, they primarily target the so-called global customer segments, which supposedly consist of customers who demand products with the same attributes and quality as those in developed countries, and could afford higher prices. According to Khanna and Palepu (2006), this leaves out the *glocal* segment, that is, the group that demands products with global quality, but with functions and features that fit their local context and needs, and at an affordable price. Not to mention that it overlooks the segment defined as the *bottom of the pyramid* by the Prahalad and Hammond (2002). That is, the largest segment of society with considerable cumulative buying power remains largely untapped. So, utilizing the accumulated social and cultural capital to provide products that target the glocal and the bottom of the pyramid segments, instead of products that match global companies' could be a strategy that enables local companies to cater to large markets.

Another prospect for success is the East Asian model. Companies here have used the OEM or joint venture agreements with global companies as an opportunity to learn from global companies (Hobday, 1995; Kim and Nelson, 2000). They have effectively used the cooperation with global companies to build up a technological base, transfer state-of-the-art work models, and develop innovative capabilities and culture of R&D. Thus, over time, they have moved from offering manufacturing services to global companies to designing new products to known brands. Companies like BenQ or Flextronics have these days moved further to offering co-branded or branded products globally which enable them to reap higher profits.

Building on strengths at home is not only a way to defend domestic market but also a base for launching international expansion strategies as in the cases of Philippines' fast food chain Jollibee or Mexican Cemex. Bartlett and Ghoshal (2000) consider it as being possible either through targeting niche markets or developing capabilities to go head on head with the global players. While design is mentioned as an important competence, for example in the leapfrogging of Asian companies, there is not much attention in business research on design's specific contribution to global competitiveness of local companies.

Design and Global Competitiveness

In design research, on the other hand, there has been a significant amount of effort on design as a competitive tool in general (Walsh, Roy, and Bruce, 1988; Walsh, Roy, Potter, and Bruce, 1992; Roy and Potter, 1997; Roy and Gardiner, 1984). Design contributes to the creation of both price and non-price competitive factors (e.g., Walsh et al., 1992). That is, it is a tool to compete through low cost and product differentiation alike. However, cost based competition is increasingly seen as unsustainable (Porter, 1986a, 1986b). Today, low cost and quality have already become a common standard for almost any manufacture. Therefore, design as a tool for differentiation gains major significance. After all, it is design's responsibility to create product characteristics such as appearance, image, ease of use, ergonomics, safety, comfort, reliability, etc. that become key differentiators in the eyes of customers.

When it comes to competition in global markets, Lorenz (1986) sees the role of design as differentiator as having a primary impact on organizational success. Unghanawa and Baker's (1989) research on international competitiveness of receivers of British Queen's Award companies shows that companies with higher international competitiveness are also attentive of design issues such as use performance, sophistication, aesthetics, etc. Others emphasize design's competitive role as that of creating products that could work in several cultures, of high quality, cross-functional innovation, strong brand image, and global identity (e.g., Cai, 2001; Gagliardi, 2001; Schechter, 1997). Yet for others the differentiation design brings is though its understanding of human factors and specifically cultural human factors (Heskett, 1995; Whitney, 1995). However, note that, as in business research, the debate here is biased too in that it reflects one side of the coin only. According to Margolin (2006), in developing countries, design's contribution is too much aligned with social development and poverty alleviation (e.g., Papanek, 1977, 1983, 1986). This ignores the true potential that design could bring to the development of these countries through industrial activity and creation of globally competitive products. Several studies exist which build a link between design's use as an industrial activity and the overall national competitiveness and economic development in these countries (e.g., Bonsiepe, 1991,1999; Chatterje, 2005; Kyung Won, 1998; Sulfikar, 2002). But, given the challenges and opportunities already discussed, how could design be used specifically as a competitive tool at company level? In companies from various industries in Turkey, ranging from traditional ones like textiles to ones with strong global players like electronics, design is seen as contributing to, or having a great potential for contribution in, the shaping and execution of four major strategies. These include (1) tapping into tradition, (2) building pride in local identity, (3) targeting local problems, and (4) adaptive learning from partners.

1. Tapping into Tradition

Traditions are time-honored practices passed down through generations. They are a complex set of practices, symbols, and objects. A number of Turkish companies have already exploited their internalized knowledge of the local culture and traditions to achieve market success. One of the most obvious approaches is to apply traditional visual elements, such as forms, icons, surface treatments, etc. on product form and styling in order to develop products with high symbolic and emotional value. Others have looked into practices and needs surrounding traditional practices such as cooking and eating.

Pasabahce is one such company that protects its position by tapping into tradition. It is Turkey's largest glassware manufacturer, established in 1935 as one of the major industrial facilities of the then newly found Turkish Republic. Yet, in fact, it is considered as a successor of the Beykoz Glassware Production which dates back to the 18th century. Because of this history, the company has assumed an approach of both carrying on the Beykoz tradition and producing affordable everyday glassware to masses. This translates to a large product portfolio ranging from the common tulip shaped tea glasses to rare hand-made glass objects available through various channels from street vendors to prestigious Pasabahce stores. The strategy is to preserve the past and the unique cultural values while exploring future possibilities. For this reason, Pasabahce encourages designers to study traditional forms and production methods, but they also co-place designers in R&D division with engineers working on new technologies and materials. This sometimes results in revising, reinterpreting, and putting back into fashion forms that had been taken for granted or had become obsolete. For example, the redesign of the tulip shaped tea glass has come in time when younger generation is oriented toward using mugs and the traditional glass had started to be perceived as belonging to the older generation.

In the early 1990s, Pasabahce faced a competition from Arc International (Luminac, Arcoroc, Arcopal) which came with low cost and quality glassware products. However, their product portfolio was quite limited compared to Pasabahce's, which has evolved and fine tuned over the years to meet the needs of Turkish households. Moreover, the symbolic connotations of Pasabahce products and brand are deeply rooted. Pasabahce invests effort to reiterate its roots through special limited collection of hand made pieces. For example, one of the two limited collection introduced in the beginning of 2007 is called History-Culture-Glass. It is based on a study of forms and decorative patterns of Anatolian Civilizations, such as Assyrian and Hittit pottery and Zeugma mosaics. Such efforts allow Pashabahce to utilize the cultural capital

and to offer the symbolism of authenticity and prestige. This strategy enabled the company to become successful in other countries of the region too, such as Russia, Grece, Georgia, Egypt, Romania etc.

Gaia and Gino, a home accessories company established by Decorium in 2004, also taps into tradition yet in a different way than Pasabahce does. The company was set out as a so-called designer global brand. It works with star designers such as Karim Rashid and Arik Levy to create decorative products with high emotional content. Designers are often invited to Istanbul to get to know the city and design objects inspired by the Turkish culture but at the same time with a global appeal. Since the company was set with an international scope from the beginning, what the traditional content brings is a distinctiveness associated with myths and cultural associations. That is also visible through the extensive media coverage from Vogue and Times to Russian decoration magazines.

Tapping into tradition is not limited to formal explorations only. For example, Arcelik's products such as the Turkish coffee maker, Telve, and the tea maker, Tiryaki, address particular local practices of tea and coffee making. For example, the electric tea maker replicates the steps in the conventional brewing technique. Also, visually, it carries the formal connotations of the conventional tea maker, where two pots are rested on top of each other. Nevertheless, these products target practices which are closely related to catering of guests, and thus, the effort invested is not seen as a chore. This remains as a barrier of market acceptance so far. Yet the mere existence of such products on the market increases local customers' trust in the brand.

2. Building Pride in Local Identity

Erak Clothing's Mavi Jeans brand, established in 1991, today stands up as one of the top under-20 brands in the US (Time, 2006). During the 1980s, Erak was contract manufacturer for famous brands like Lee, Wrangler, CK, and Esprit, among others, capitalizing on top-quality Turkish cotton and competitive labor costs. This gave an opportunity to the company to learn from its buyers and contract granters about how to improve its production processes, increase its manufacturing speed and flexibility, and obtain high quality products in a consistent way. But, even more importantly, through interaction with buyer companies like the Italian Rifle, the company learned that real profits were in establishing its own design and branding capabilities (Tokatlı and Kızılgün, 2004). So, when in 1991 Mavi Jeans was introduced, design and brand were the two major differentiators for its products. At that time, an established jean market with several well known western brands, such as Lee, Levi's, Mustang etc., as well as local ones giving the impression of being imported products, such as Pyramid, Loft etc. already existed. In terms of brand name, Mavi chose a risky but well paid off strategy of using a Turkish name (mavi=blue). It is rare for a company producing "western product" to stress localness through their name. The logo which is a modern and youthful crescent and star interpretation, symbols of the Turkish flag, further emphasized the origin of the brand. However, this, combined with the unique design and high quality, increased the respect and self worth rather than creating reactance. At the time Mavi entered the market jeans were almost identical. Mavi chose to treat them as fashion items like any other garment. It also utilized very well the Turkish competency in textiles offering unique denims ranging from soft fleecy feel to heavy knitted ones. Additionally, it studied the anthropometric requirements of its customers and offered a much wider range of sizes.

Mavi's real success, however, came with its exports, and specifically its entry to the US market since no other clothing is as American as jeans. Here it is marketed as a "designer" brand at stores like as Bloomingdales, Nordstrom as well as the recently opened Mavi flagship stores. Mavi targeted exclusive niches which would appreciate the designed details, unique materials, and carefully crafted fits. Mavi Jeans develops designs based on the trends and concerns in different countries and works with designers from that country. In the United States, for example, it works with Adriano Goldshmeid from CK who knows well not only the tastes but also the lifestyles of the American MTV generation. Unlike other global brands, which outsource to many different manufacturers because of its own flexible, high-tech production plant, Mavi can afford to customize its jeans to accommodate different tastes. The success abroad reduced the feelings of deficiency, increased self-esteem and self-respect, and fostered pride in the local market, leading to an empowering and confidence-building cycle.

Mavi is an excellent example of how the prejudice and the disdain to local products could be overcome. It is also a perfect example of how through original design and marketing, local competency in raw materials can turn out to be a high value-added competitive advantage.

3. Addressing Local Problems

One of the opportunity areas for local companies discussed earlier was serving to segments to which global companies were not sensitive enough. For many global companies, serving to lower segments means offering cheaper, lower technology, or obsolete products, ignoring users' real needs and demand for sophisticated ones.

Karel Electronics is a company that was able to establish itself as a major player in the Turkish market by identifying a largely unexplored market for small scale telephone switchboards. In Turkey, more than 95% of the businesses are SMEs. Such businesses need easy-to-use, robust telephone systems with few lines, and cannot afford full-scale switchboards. Even if they could, much of the capacity offered would remain unused, and a large amount of office space would be occupied. So Karel was originally set up to design fully automatic telephone switchboards for small offices. The company grew rapidly selling these PBSs and peripheral products through the distribution network composed of authorized distributors, wholesalers, dealers and sales points. This network also became a means for feedback and improved quality.

Over the years, Karel used internal designers and design consultancies like Izmir based Nesne Tasarım to evolve its products to better meet the needs and desires of the SMEs and support its core product with peripheral systems, enabling its customers one-stop-shopping for all their communication needs. For example, their smallest PBX, called MS38, was redesigned offering not only several capacity options, but also an attractive appeal, smaller space occupancy, easier installation, and use.

The need for such small scale PBXs existed in other countries with similar business structure and infrastructure too. Today, Karel sells in about 50 countries such as Poland, Hungary, Romania, Jordan, Tunisia, Saudi Arabia, Lebanon, Egypt, Iran, Nigeria, India, Greece, Spain, Portugal, etc. In some countries, Karel's price differential with the closest competitor runs up to fivefold.

An automotive company, Otokar, has also been successful in remaining competitive by addressing local needs. Otokar is manufacturer of vehicles such as city buses, mini- and midi-buses, trailers, and armored vehicles. Otokar produces under license agreements, previously of Magirus-Deutz and now Land Rover. Although Otokar does not have its own technology, it successfully identifies the market gap and adapts licensed technology to local requirements. Take, for example, the minibuses designed and produced specifically as dolmuş[2], like the M2000 series. Otokar minibuses have become the prototypical vehicle of dolmuş service. Since most dolmuş drivers are also the owners of the vehicle, cost and durability are the two most important factors for them. Therefore, a major design priority is to make durable and low- purchase, operation, and maintenance cost product. Dolmuş minibuses are designed to allow for several standing passengers since there is always more demand than seats available. The role of design here is to provide the base equipment only.

Iveco and Mercedes have recently attempted to enter the dolmuş market. Instead of designing a new minibus specifically for use as dolmuş, they adapted their commercial minibuses by adding seats and windows. This and the more sophisticated production systems of each of these two companies made the retail price of their dolmuş minibuses much lower than that of Otokar's. In the end, however, these vehicles turned out to be less effective and less durable. They also failed to match the low cost spare parts of Otokar and the widespread service network that Otokar has.

Otokar minibuses and Sultan series midibuses are also in high demand in countries where the traffic and the infrastructure is similar to that of in Turkey such as the Middle Eastern countries.

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[2] Dolmus is a unique public transportation in Turkey. It can be described as a collective cab, which follows a specific route, but has flexible stops. Dolmuses are more readily available than city buses and the ride costs less than it does with cab.

4. Adaptive Learning from Partners

The success stories of Mavi Jeans and Otokar show that local companies could learn and acquire knowledge that moves them to creating higher value added products through partnerships, contract or license agreements with established global players. Although the high value added activities of global players, such as design and marketing, remain firmly in their centers, an awareness of those activities starts to emerge among the local partners. For example, this is exactly what happened with Vestel's move from OEM to original design manufacturing (ODM) to own brand management (OBM). During its OEM contracting, Vestel not only built an awareness of the value added by design among its clients, but it also learned how designers function within a company thanks to its close collaboration with designers in companies like Toshiba and Sharp. Creating its own original designs soon became indispensable for Vestel to keep its existent clients from moving away to lower cost Chinese manufacturers and to attract new ones. At the same time, design is seen as a key competence in moving higher in the value added chain to establish its own brand in the domestic and some export markets. What distinguishes Vestel from Mavi or Otokar is that Vestel is attempting to compete on the same terms as the global companies, whereas others adapt what they have learned to utilize local needs or resources.

Discussion

All cases analyzed above have to some extent achieved some success in competing with global players either in domestic or international market, utilizing their knowledge of the local culture and resources. Note however that such knowledge may be innately available to any company. That is, by definition, it is internalized and tacit (Polanyi, 1983). As such, it may easily be taken for granted or devaluated as a competitive asset. So it is one thing to possess the knowledge, but quite another to be able to turn it into a competitive strategy. It is exactly here, that is, in the process of putting the local knowledge into use that design comes into a play. As McCracken (1988) writes, design carries major responsibility in creating seamless transfer between spheres of production and use by acting as cultural translator. That is, design uses its understanding of local problems, behaviors, and culture to create products in such a way that users can see that the object so designed possesses certain cultural meanings and addresses their real needs.

For designers, using cultural resources is not an easy and straightforward task. For one thing, there is always the danger of trivialization of local culture by fostering stereotypical images or creating a temporary popular trend. Also, relying on one advantage only, such as reinterpretation of local forms and symbols, may not lead to sustainable competitive advantage, as it is not hard to replicate strategy. The cases discussed above do not really use one of the advantages only, but choose to blend several of them. For example, Otokar designs vehicles particular to local needs, but it is also supported with a complex supplier, distributor, and service network. Similarly, Mavi capitalizes on designs exploiting high quality local cotton, are attentive to different tastes, and relies on flexible manufacturing capabilities acquired over time. So, in order to contribute to the competitiveness of local companies, design has to go beyond the trivial application of cultural icons. The true contribution comes when it is able to combine the understanding of the local context and cultural values with the unique resources and manufacturing and market conditions of the local firms in the creation of user-centered, culturally desirable and appropriate products.

Yet another challenge is to be able to utilize the local knowledge on an ongoing basis. Local companies which start with an insight of an unmet user needs, or have an innate understanding of what is socially desirable may become blind to their own local understanding as they grow larger and distance themselves from their users. As more global companies are investing to better understand local markets by employing social scientists and user-centered design teams, local companies cannot safely rely on their own intuitive understanding of the local culture. Therefore, they too need more structured approaches to explicate their local knowledge, and get constant user feedback.

It is clear that a better understanding of the local problems, behaviors, and culture, and creating products that communicate those give the company a strong position at home. But the question still remains as to how a company's competitive assets translate internationally if they rely on local knowledge only? The strategy that many local companies that

want to go global adopt is to build capabilities and resources that big players have, target the same market and try to catch and match them. This is very difficult to achieve considering the fact that locals start far behind in terms of recourses and political and economic barriers. The cases analyzed here have been chosen based on their success in the domestic market but all have some international presence too. Figure 1 shows the alternative paths taken by these companies.

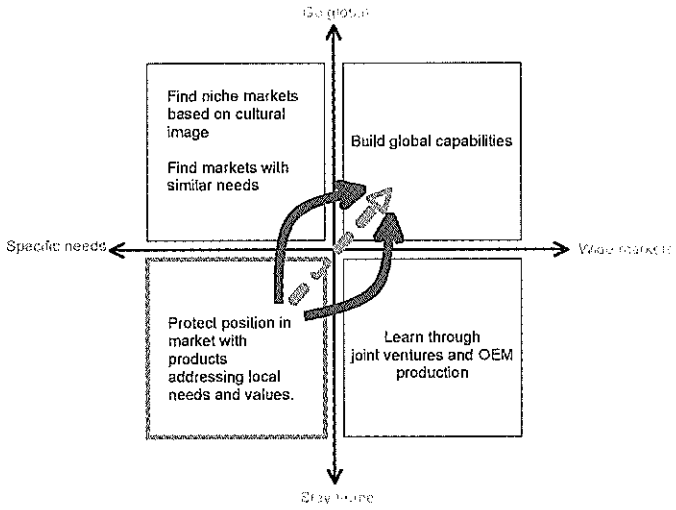


Figure 1. Alternative strategies for global competitiveness.

By focusing on local issues, user behaviors, and cultural values which are not otherwise known to the western global companies, local companies may not only secure their position at home but also set a launching path for global expansion. One strategy for local companies would be to target niche markets abroad emphasizing localness, authenticity, and prestige as distinguishing characteristics, as in the case of Gaia and Gino. Such a strategy needs to be supported with sophisticated design and marketing. Another strategy would be to look for markets with similar characteristics and needs. This works specifically for companies competing on the basis of solving local problems like Karel and Otokar. Opportunities in this area could be abundant, especially for companies that target the base of the pyramid, as this segment's needs are largely unmet and to a large extend are similar worldwide. Yet another strategy would be developing an understanding of the industry in which the company operates and global markets. Here the challenge is to identify unique strengths and gaps in the global market, as in the case of Mavi Jeans.

User centered approach in domestic market and exploiting cultural knowledge could open up a place for local products and companies in the global markets. This, in turn, could increase trust in domestic products and foster and sustain the competitiveness of local firms in the long term. Of course, Lorenz's (1986) warning that globalization could be a double-edged sword is always there.

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THE QUESTION OF DESIGN AESTHETICS: SOME THOUGHTS ON ITS FORMULATION NOWADAYS

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Abstract

Many time ago, Alain Findeli explained the need of developing seriously the aesthetic side of Design Philosophy (Design Issues, 1994). Then, as far as it has been approved a law in many countries of the EU to protect design components and practice in products, the aesthetic side of the whole matter is now at stake because it is also something considered objective enough to be able to be protected legally. For the rest, recent innovation policies are considering design as an innovative tool not only depending on the play of appearances. It is also broadly accepted, and even it is become a boring topic, that design and a beautiful look are nowadays an important tool to give value to products, brands and services; moreover, design and its knowledge on costumer's behaviour within everyday life should also be a tool to lead and orient a marketing centred on users. So, for many reasons, it is time that design discourse considers and to take seriously the aesthetic side and try to explain the difficulty of approaching theoretically what an Aesthetic of Design must be.

The paper is a reflection on what has been said by Philosophical Aesthetics considering everyday life and products and tries as well to outline the problems a research field such as this should face in the process.

1. The Aesthetic in the Quantified World: Relevance of Aesthetics in Design

Although, generally, it has always seemed difficult and suspicious to speak of aesthetics in the world of design, some events have brought the question to the fore again, adding a new perspective. For some time now, management and organizational theory have considered aesthetic phenomena as determining factors in their proposals to define and develop products: this is the case of marketing, for which the aesthetic, generally a synonym for style, constitutes a means to classify life styles, or consumer patterns and as such define formal repertoires as a starting point to place new products and services in a social niche in the market. It would be convenient to remember that they have had great success with this approach because the aesthetic in design has entered into the legislation and the economic policies relevant to R+D in their mercantile and fiscal aspects. We'll have a look at some examples.

In 1998, the EU, thanks in large part to the efforts of BEDA,[1] passed a directive for the legal protection of industrial design with the idea of unifying the different interpretations. The office that watches over its enforcement and helps businesses and designers protect their design assets in all of Europe is at present located in Alicante (Spain). It is the OAMI. This directive has inspired Spanish law on legal protection of industrial design and probably also laws in other countries in the European Union. Spanish law understands industrial design to be the following:

> "The appearance of a product or one of its parts relating to line, color, form, texture or the materials of the product itself or its decoration. Excluded are those characteristics of the appearance of a product dictated or directly derived from technical function. Product is understood to be all those industrial or craft articles, including all that is used to show a whole finished product, its packaging, presentation, graphic symbols or typographical characters." [2]

There's no doubt that the law entails a definition of design, at least the legal definition, which, whether or not we agree,

establishes the rule of the game for the designers as a profession. In effect, it unequivocally separates design from technological innovation and technical aspects, and assigns the task of design to questions of the appearance of objects and products although it claims not to speak at all about aesthetics.

Further along, the text of the law calls attention to how complex it is to try to define the contribution of design and how difficult it is to legally confront aspects that traditionally have been the characteristics of a strong aesthetic reflection. In my view, it reflects perfectly the complexity of the debates in the world of design with respect to the nature of its activity and its reason for being. In this sense, what stands out most is the effort to objectively define that which can be protected legally and, as such, demonstrable. This is how it appears in the Statement of Motives II:

> "Both the European Community norms and this law are inspired by the criteria that the asset legally protected by the property of industrial design is, first and foremost, commercial value added to the product by design, without regard to its aesthetic or artistic level and its originality. Industrial design is conceived as a type of formal innovation concerned with the characteristics of the appearance of the product itself or of its ornamentation (...) The conditions of protection of industrial design are therefore purely objective: the legal coverage reaches novel and singular designs (...) in applying this criteria, those designs are registered which produce a different impression from other designs in the informed user..."

Specifically concerning the aesthetic, what the text suggests is that the aesthetic value, whether or not it's artistic, also includes a judgment about the quality of the resulting design, which makes it even more complex than it was before. From this perspective, the new rules of the game are clear: in design the only objective criteria are those that can be defined in commercial terms, that is, according to marketing. Now, as the argument progresses, we see that some commercial criteria are also slippery or hard to define. For example, in title IV of the Statement of Motives we can observe the effort made to describe the way designers work and what, in this particular case, could be interpreted as that which is considered creativity among designers:

> "The differentiation of form and function is what means that the external form of a utilitarian product can be protected as design, when the characteristics of appearance also bring novelty and singularity.
>
> The reference to the degree of liberty of the designer does not necessarily imply that the extension of protection is inversely proportional to the functionality of the design since a design can be highly creative and functional at the same time. We must take into account that the design industry includes very diverse sectors and that not a few times the creativity of designers moves in the core of trends or margins of shared sensibility, common to the tastes or fashions of a time."

In this last point, the aesthetic and its social implications come up in the definition of the problem from its core, but, as has become the norm, we still tiptoe around the issue. The point is not so much asking for legal protection of the aesthetic contribution but to show how important it will be from now on to have guidelines to understand and discuss those aesthetic factors which identify a particular design.

A second event to take into account is the definition of the new indicators established in the last years to measure the role that innovation plays in a country's economy. The most relevant fact here now is the consideration of design as a factor of innovation even though design is still understood either as a marketing resource, in the case of non-technological innovation, or as product development engineering in the case of technological innovation. However, there can be no doubt that this acknowledgement constitutes a significant event, something to celebrate from the perspective of the profession of design. Data arrives from two main sources, on one hand, the European Innovation Scoreboard of 2004 (EIS) and its 2005 update, and on the other hand, from the revised 3rd edition of the Oslo Manual, published online on October 25th 2006, prepared jointly by the OCDE and Eurostat.[3]

Looking at the whole, the aim of the proposal is the promotion of research in all areas of business, stressing the need to experiment and investigate new ways of marketing,

distributing and promoting. But it also encourages research directed at renovating and expanding the range of products and services in the corresponding markets. Many of these aspects have been dealt with from both the practice of design and marketing and other organizational strategies. In fact even though in this context design is still defined as one of marketing's innovations –"in reference to the shape and appearance of products and not to their technical specifications or other functional or working characteristics,"– since the Oslo Manual we are advised to understand design as an integral part of the development and the implementation of products as well as the innovation of processes. We must take into account that there are two ways to innovate: in the product or in the process: "the innovation of a product refers to a good or a service whereas innovation of a process implies changes in the production function in aspects like equipment, human resources or working methods, among others."

According to a report on innovation in Spain (2005) in the frame of the 2005 Oslo Manual (Zozaya 2005) an innovation in a product, if it is of great magnitude, tends to last longer than the innovation of processes since the latter are more easily copied by competitors. In this light, a new frame of work is opening up for design in all its varieties. Particularly for that design that wishes to be deeply innovative, of the sort that has a real influence and becomes a part of people's lives and culture.

Further along, the same study states that industrial design in Spain constitutes one of the main fields in science and technology. In this case, what are the innovative aspects expected from design? It says, "innovative activities introduce change in strategy, management, organization, marketing and the aesthetic aspects of products." Furthermore, "in Spain, it's the aesthetic aspects which have often been crucial in the buyer's decision and those which have developed more, over the European average." This is relevant data. However the country's everyday reality disproves it. In any case, this study includes no clue as to how it defines aesthetic innovation. We do not know whether the latter refers to fashion matters and in the sense of updating products' appearance or whether products have effected a new aesthetic, which would have a profound impact on culture.

In this sense, it is probable that aesthetics, aesthetic innovation, is then a question of marketing and of organizational strategies, but even if we accept that there is no doubt that the expression and the decisions made about aesthetics belong to design, even as it is defined by marketing and is confirmed by the law of legal protection of design. In this context, when the aesthetics of design are at the forefront of economic and business activity, it would be advisable to devote more attention to them and make them the object of a study to grasp the extent of the designer's responsibility as far as aesthetics is concerned and to what extent are the designer's aesthetic decisions those which permit the designer to continue to play a cultural role in the broadest and strongest sense of the word "culture".[4] It may not be more than a hypothesis but the question that all "aesthetic" implies is one about quality and its limits. Today's concern is quality in design in all of its disciplines.

2. On Beauty as Innovation.

Among designers, it is usual to regard suspiciously the sort of definitions and explanations about what design does. Especially suspicious are those unexplained distinctions, like those in the aforementioned law, between form and function, between technical components and technological innovation and its presentation in society through a dress, or carcass, its becoming a shape through the materializing of something which is believed to be what design is about. We had always struggled to show what a difference the real contribution of design could make by stressing the designer's ability to notice constant changes in functions, that is, in the ways people live, in their habits and values and not only in their tastes and points of view. If design must now be understood in terms of innovation it would be convenient to make a similar effort so that design understands itself, its task, its knowledge and the object of its impact and the ends of its role in the proposal and launch of new products and services. If we focus in those big innovations so that they last for a long period of time we must reformulate design and the designer's functions so that they may be understood and respected in actions leading to innovation and they are incorporated as a contribution which has a lot to say from the start, and throughout the whole process, in the development and implementation of products and services. Even in the case where the innovation in "aesthetic aspects" falls under the exclusive responsibility of design, is it possible to speak of aesthetic innovation? And if it were possible, what would it entail?

Whether for aesthetic reasons or simply for design, the truth is that from the point of view of aesthetics, understood as a reflection on the nature of beauty and its manifestations, there are few resources to understand the impact of aesthetic innovation on everyday objects and the dominant visual culture. Modern aesthetics has said little or very little about the world outside the artistic, about its laws and its possible goals. Throughout history some has been said about decoration, as a value in itself, and about the use of ornamental techniques to solve the aesthetic problems of many objects, including machines and tools; there are other means to treat the issue, like the logics of proportions and their application to the normalization of industrial formats and components, the laws of form or the psychology of colors to speak only in terms habitual among designers and design teachers. Now, if we accept as a departure point of a reflection on design aesthetics that separation between function and form literally stated by a law as the basis of the objective in the labor of design – conceived now as an intangible whose contribution is a formal innovation related to "the appearance of the product as such or to its ornamentation" – the discussion about design is brought back to terms of procedures of formalization and its problems.

This also connects with aesthetics as a discipline, at least with that view of aesthetics as an understanding of form and of all sensory experience inherited from Kantian philosophical aesthetics. Therefore there is no doubt that at least popularly there is a very strong connection between form and aesthetic; the question is to know whether designing is reduced only to innovatively solving form seeking an aesthetic effect. Also in aesthetic terms this can be a mere makeup job, which has always been considered a styling procedure but not necessarily design.

To speak in the terms of a design aesthetics, we have to ask if the aesthetic, the beauty in things, is something that can be superficially added to objects and graphics as if it were a coat of paint or whether it's a more structural matter. We run once again into the old Socratic question, "what is beauty?" The aforementioned law and the commercial definition of design imply the publicly accepted notion of design which is no longer a way of being of objects, which carries an axiological criterion to discover the quality of things, but has become a superficial ornament or a finish. In this way, the act of designing and the aesthetic understanding of what is designed become simple cosmetic operations and because of that it is logical that objects with a style determined by a marketing plan appear. However, when a designer works with these suppositions we have to ask whether they are enough to achieve true innovations of real magnitude and depth.

Questions such as this establish a degree of relation between the many reflections made by design to understand itself and those developed by aesthetics throughout history to create a space for itself in the system of knowledge since it was created after the first half of the 18th century. That doesn't mean that the concern of thinkers to understand the aesthetic phenomenon, from the beauty of things to the raison d'être of art, hadn't been present in earlier philosophy. Quite the contrary. Beauty and its appreciator were a theme of constant reflection for philosophy even before aesthetics and art became independent. In the 18th century it was articulated as two parallel but independent investigations. Now, since the scientific revolution and the development undergone by natural sciences, all phenomena treated by aesthetics were to some extent undervalued since they were pushed to the margin of what really preoccupied people. What efforts 19th century thinkers had to make in order to prove that the aesthetic was essential for life and the development of human faculties, to prove that art was not an ornament to life but quite the opposite!

It is easy to establish a parallelism between both lines of reasoning, between on the one hand design's struggle to prove that it is not a mere ornament, the aesthetic finish which objects have and which allows them to become a part of the market, finding a place for themselves in one niche or another and on the other hand in the constant affirmation of the aesthetic to demonstrate the value of quality and cultural density of works of art to the development of the human in humanity and cultural variety. It remains to be seen whether real innovation does not depend exactly on the possibility of design to rely on this aesthetic density of everyday objects as I suggested at the beginning of this introduction. In this sense one of the hypotheses that has inspired this paper has been the conviction that there are many shared elements between the aesthetic discourse and design's discourse and that they are interdependent.

3. On the Potential of the Aesthetic in the Modern Project

At this point, after the long and intense debate over modernity and its liberating principles, the importance of aesthetics role in modernity has become perfectly clear. It is worth remembering the earliest period of aesthetics as a discipline around the 18th century, when the questions discussed were the reasons to explain the variety of existing tastes, the problem of educating taste or the ways in which luxury was incorporated in daily objects and the economic consequences derived. Bernard de Mandeville first but also Hume, Hogarth, Burke, Voltaire, Diderot, Rousseau, Condillac, or even Montisquieu participated in the debate focusing on the educational possibilities of the aesthetic experience in the development of human faculties from sensory perception, through sensory pleasures –as in the case of gastronomy– to the intellectual capacities of art appreciation including building and objects, especially luxury goods, that is, the products of highly sophisticated craftsmanship. That was happening just before the birth of aesthetics as such, not of aesthetic discourse or the discourse on beauty which come from antiquity; summing up, before or at the time of Baumgarten, the author who gave name to area of thought, philosophical aesthetics, which deals with sensory or aesthetic knowledge.[5]

It is easy to see how close the human ideal formulated by aesthetics is into many of the ideals that the culture of design has advanced in the last two centuries. So for example, as first proposed by Shaftesbury and then Hume and so many others at the beginning of the 18th century, the aesthetic quality of everyday objects was seen as the result of humanity's numerous efforts to improve its condition and therefore they saw the aesthetic quality as the tangible proof of human progress in search of well-being. From their point of view, being able to lead a comfortable life requires having dedicated as much effort to cultivating oneself as to one's cultural instruction, "In caring for one's garden, in dressing elegantly and in the care of one's house." Even though the words used have an old-fashioned ring to them, there's no doubt that at that time the matters that are now design's main concern occupied a significant place in the quest for human progress which was fundamentally based on the refining of the pleasures of the senses through the improvement of the immediate surroundings. Of all of this it is worth stressing that the aesthetic, that is the enjoyment of beauty, was considered as a most important humanizing factor, as important as art has been since then to the cultivation of the human spirit.

If the cultivation of sensibility constituted a key element in the formation of civilized persons at the dawn of modernity, it did not shed that character as The Enlightenment and its culture progressively imposed themselves socially and culturally. It was probably the German poet Schiller who, after Kant, gave aesthetics the greatest role in the progress of humanity as can be seen in his famous letters on the aesthetic education of man, which considered the aesthetic the foundation of all human activity and moral righteousness.[6] Little by little, first in romanticism and then in many other movements until finally in aestheticism at the end of the 19th century, the artistic phenomena in particular, and the beautiful in general, began to fill the space reserved for that which is human and which other areas of knowledge had swept aside, be it because of materialism, because of the will to know at all costs so that the aesthetic stopped being concerned with the sensory to include also the emotional, while the first was progressively relegated. But at the same time, as part of that same process, the interest of reflection focused increasingly on art, considered the seat of beauty, while the beautiful as such became blurry as it was substituted by the sublime and many other aesthetic categories. Thus, a few paths were closed to aesthetic reflection as it was connected more and more with a philosophy of art. Logically those minor and useful arts which had been interesting in the past to aesthetic reflection were marginalized as in the territory of the useful, the prosaic and the everyday, even of the banal.[7]

In this context, when the need for design came up in aesthetic terms in mid-19th century England, it brought with it a load of great moral obligations among which one of the most important was precisely to watch over the aesthetic improvement of industrially made everyday objects, as well as care of the beauty of the landscape. Since then, the concept of design entails this idea of quality –structural, not of language or style– that differentiates some industrial products from others simply because in some there is a pretense of design and quality from the outset. From this perspective there is no doubt that the history of the idea of design, as well as the writings of many designers published since, can be re-read as a reflection on the aesthetic character, as research of criteria and foundations on which to base an aesthetic adequate to

industrial process as a new means of production, belonging to people in the industrial age. Functionalism also can be understood as an aesthetic concept "what works best is the most beautiful," a theory that tried to overcome the opposition of beauty and utility as defined by modern aesthetics and systematized by Kant, which would inspire the 19th century and a good part of the 20th. Something similar can be predicated on such an important methodological principle as Mies Van der Rohe's "less is more," which responds as well to a particular aesthetic preference – the old and quiet austerity of classical décor. In that time, well into the 20th century, many things had changed in relation to the beginning of aesthetics, but also in design Mies' principle was a response to desire for quality to be shared collectively, an entire project of great social scope.[8] In the long run, the principle became a theory of modern luxury based on an elitist understanding of art and culture inherited from past times and justified by a class system. Overcoming the elitist aspect without renouncing aesthetic quality is the challenge inherited from Pop design.

However, design and everyday objects were never of much interest for aesthetic reflection and philosophy throughout this period. They are part of everyday life and, because of that, part of the realm of those things criticized by academic thought. Also, the Kantian legacy had left the useful and the necessary out of the realm of beauty, having turned the useful into the opposite of the beautiful and its qualities. Aesthetics then either was concerned with understanding art and its manifestations or with the knowledge that comes to us through the senses, but the experience or the pleasure before human productions, particularly if these had a strong technological component, were left aside. It is worth remembering here how intense and frequent the critique on instrumental reason in the thinking of the 20th century has been from Max Weber to Theodore W. Adorno, including Walter Benjamin, Martin Heidegger and W. F. Haug and his denouncement of design as seductive appearance of merchandise, a manipulative aesthetic at the service of capitalism and its preservation. From this perspective, art, true art, not the minor art or applied art or decorative art nor popular art or the products of mass culture, and even less the production of everyday images for the media, has often been considered the last refuge of what's truly human. How difficult it then becomes to find in modernity's thinking enough elements to understand what design has done in the way of satisfying its founding principle, namely, improving the aesthetics of the contemporary world, making it a livable environment and a landscape that satisfies and cultivates the human side of people. In general, aesthetic thought has always tended to see in design's aestheticization (not only design's but also manifestations of the aesthetic in the visual culture of the media, the proposal of a second hand or impoverished aesthetics that compensates for the impossibility of an aesthetic experience in its true sense.[9]

We should remember here and now that design's old utopia was of an aesthetic nature. Underlying the German theory of Good Form, for example, apart from an aesthetic of merchandise proposed in relation to the market and with views towards mass consumption, there was also a democratic ideal. Designs were made following a standard of quality but keeping in mind that through quality design everybody, the whole of consumers, would have the opportunity to use objects of a high aesthetic dignity, participating thus in the progress of aesthetics through the simple fact of using them every day.[10] In the same way that the functionalism that inspired the first Modern Movement carries an aesthetic conception, so can the Good Form or the Italian post-WWII understanding of design be re-interpreted in terms of philosophical aesthetics? For one, in the case of German design there was a moment in which a big effort was made to turn the aesthetic into something objective so as to make it a part of the fundamentals of design in an objective and scientific key.[11] This is what the Spanish culture of design inherited in its early days in the 60's.

All told, we can safely state that no remarkable effort has been made in order to understand the aesthetic utopia of design from the point of view of philosophy or philosophical aesthetics. In fact, quite the opposite has happened. Wolfgang Fritz Haug is probably the best example.[12] According to his thesis, design lost all possibility of exercising a cultural practice only to be reduced to an activity, accomplice to the system whose effects derived from its capacity to seduce, and why not say it, as false as that which can not be authentic because it has been machine made and in accordance with the financial interests of its producers. Authenticity constitutes and has constituted a key concept in the evaluation of art and people's behavior as set forth many times by philosophy. It is shared by Heidegger and Adorno, and is currently used by marketing with ease. However, read

in terms of design both in the case of Heidegger and Adorno certain echoes of Ruskin and his vindication of artistic craft –the only productive activity which is authentic and capable of obtaining something beautiful because it's the tangible proof of human action performed while being happy– resonate also in this idea of authenticity in the same way as they have always resonated every time a critique of the industrial system and the corresponding model of modernity has come up.

After Haug, with the criticism of consumer society of the 60's, design stopped being a cultivated activity to become another example of the trivialization of culture.[14] The French Situationists' contribution and in particular Guy Deborde's, consolidated that vision of the everyday as spectacle and in which the aestheticization becomes synonymous with spectacle. In reality this point of view was attuned to certain ways of designing and thinking about design but we must ask if it applies to all kinds of design all the time. The question is still open and it is a challenge to ponder. Post-modernism, for its part, has confirmed to some their fears and design as a phenomenon seems to have turned into the banal culture of the image for the masses, its one and only ever-present aesthetic vehicle. Thus once the 20th century and the modern movement and its echoes were over, the practice of design is still missing a reflection concerned with understanding and explaining both its activity as aesthetic practice, and how it could play a role –as it often has– in liberating what's human without disturbing everyday life.

4. The Present: From the Aesthetic of Merchandise to the Aestheticization of the Everyday and the Taste of the Masses

If there is one defining factor that characterizes the present moment, it is that it is very recent. At least that's what it seems when we look at the latest trends in design and culture from these first few years of the 21st century. Whether its because of the appearance of the minimal as a common denominator in many designs since the middle of the 1990's, or whether it's because of the proliferation of so much discourse around design –from eco-design to the consolidation of the "Design for All" movement, the debates about the recovery of the ethic dimension in design, or the graphic activism present in so many alternative projects– or the emphasis recently placed on the capacity to investigate about the future of design, the truth is that it seems clear that we're living in a post-modern condition. In fact, at the cutting edge of contemporary reality, what most occupies us are things like virtuality and the aesthetic in the virtual, the consequences of globalization and the derived concepts, or the awareness of the real limits of the planet and its ability to resist the aggressions, besides the development models which can be shared by all of the inhabitants, the inequalities between populations and cultural differences. Now, if what we're trying to do here and now is to consider the role of the aesthetic, and the survival of culture and aesthetics' critical capacity in the contemporary world, the discourse should take into account the legacy of the clearly post-modern stage and its social and cultural consequences.

At this point, of the many traits that identify the post-modern in general, the most relevant for design and its aesthetics are of two kinds. In the first place, the phenomena of the aestheticization of daily life, a subject amply treated during the last quarter of the 20th Century, already announced by Dorfles a long time ago, and then by many other authors. In the second place, the diffusion of the aesthetic and aesthetic behaviours in all areas of daily life, that is, outside the world of art, have placed design at the forefront of the debate together with fashion and media communication, and is now considered one of the phenomena that best represent this blurry aesthetic behavior. The corollary, logically, has been the incorporation of design to the practice and theory of the financial world, which has turned it into a value factor: that is, that design acts as an intangible that confers value –qualitatively and quantitatively– to products and merchandise, whatever their traits. Because of this mechanism, design decisions are also considered marketing decisions, in the dual role of communication with the end users and product development. In this way finally we have achieved what was becoming a key idea of design as an activity from the time of Ulm and the School of Good Form, namely, that design is not a final goal, art-finalist, that is concerned with giving form and aesthetic appearance –in good design theory that was called styling– but a complex process that participates in the decision about a product from its inception.[15] It is a strategic structural activity in an economy like the current one where the key factors go beyond the functional character of utensils, and what is bought and sold are sensations, experiences, values and even imaginary signs.

Now, if for designers the structural character of design is not novel, what's new in the post-modern legacy? What changed is not the essence of products, but the fact that design can be seen as the essence of the object. This is not necessarily derived from an innovation or technological novelty but from a complex system of functions amongst which can be counted the symbolic ones, those of greater social character –those that affect uses and customs– and, therefore, the complex system that is a way of living, understood not only as a question of tastes in the logic of the social identities of people, but also in the practices, activities and finally in the set of functions that define what any person does globally with his life. But the truly new is still, in the context of the diffuse aestheticization outside of art, and therefore in all of the domains of the everyday, the reflection on what type of aesthetics is that which corresponds to the domain of design and what is understood there as beauty. That being so, the phenomenon of the aestheticization of the everyday constitutes at least a hope to understand, from the point of view of aesthetic theory, socio-cultural phenomena as important as design itself.

To summarize it broadly, the phenomenon of the aestheticization of the everyday is resolved in a series of concrete traits of the contemporary perfectly separated as such and even defined in its function. The most significant or the history of aesthetic philosophy is the corroboration of the fact that the majority of phenomena of aestheticization are found in extra-artistic realms, which means an important shift with respect to that understanding of the aesthetic according to which one of its main objectives is to explain art or, better yet, the artistic of Fine Arts. The stress has now been placed on the aesthetic and the aesthetic behaviours of producers, or creative people in general, and end users, whether they are merely consumers or receptors. What's characteristic of the present is that the aesthetic exists and develops outside the world of art. Furthermore, for many authors aesthetics is now what constitutes the surrounding reality, an anthropological fact which defines the present, so in that way aesthetics has become perfectly joined with the economic. An author like Fulvio Carmagnola theorized, as early as 1989, that there had been an "aesthetic turn" by which aesthetic phenomena had become the interpretative model of post-modernity, since aesthetics constitutes a very specific way within the construction of meaning (1989: 44). Shortly thereafter, in his next book, and, to some extent, in disagreement with Heidegger, Carmagnola showed how merchandise had evolved to the point of growing out of its traditional values of usage and exchange, a sort of "transfiguration", "beyond themselves." The constant need for products and services to be differentiated had blended, precisely through the specific aesthetic qualities of those products, qualitative thinking with the economic. That explains why, as time has gone by, Carmagnola speaks of a "fiction economy" in which economic activity is based on symbolic goods, emotions, and the possibility to enjoy concrete experiences.[16] In fact, nowadays, those fable-like fictions underlie any discourse on brand (though not on *trade-mark*) and its management. It is another name for that economy based on intangibles.

To put it simply, it is worth taking up again the words that Wolfgang Welsch once published on the web to describe this aestheticized period. According to this German author there are at least two equally relevant types of aestheticization in the contemporary world. One of them, the more superficial type (characteristic of globalization) occurs in global phenomena. It consists in either the "beautification or aesthetic styling of reality," or in the conversion to "hedonism as a new matrix of culture," or in "an economic strategy."[17] This last option connects with what the beginning of this paper sought to explain and focuses on the economy and marketing techniques appropriation of aesthetics. It is one of the usual definitions used to show the strategic character of design but in fact it mirrors the view of design as mere added value resulting from the addition of ornaments at the end of the process. Many other authors, including the main representatives of Design Management, have taken up again this type of discourse and its implications to redefine the place of design and its activity in the contemporary world. Here is an example chosen at random from the current bibliography:

> "Objects in our present condition of society have become signs, no longer symbols, and therefore their meaning is increasingly aesthetic, not cognitive... the particular object therefore has to be judged as aesthetic experience, as part of an event, by a subject as singular, no longer as universal. The experiencing subject knows things in terms of the ontological structures proper to things themselves. Subject is in the world among objects. Subjects no longer know objects– they now experience them".[18]

From statements like this it can be infered several things in order to understand the aesthetic; they are similar to those revived by post-modern thought to speak of areas of knowledge and scientific knowledge and the post-modern condition.[19] These are factors like the assimilation of the aesthetic to subjective experience, private and individual, or more specifically, local. One example is the ease to judge without knowledge, without needing to know the rules that justify the judging, which is the way people's taste seems to operate. Another example is the fascination with the individual case, the different and the specific of things or situations... In fact, it is worth remembering that the aesthetic, and in particular, the way the aesthetic judgment is carried out (or reasoned?), is nowadays an important model for many other discourses, be they rhetorical or not, from hard science to practical or management disciplines (Carmagnola 1989). In this sense, the concept of aesthetic experience as it has been defined by philosophical aesthetics has contributed an excellent model to explain the consumers' experience which the marketing of emotion and the image based economy have used to explain design's goals in business, in attracting and keeping potential clients. It must be remember that, as Fulvio Carmagnola has explained repeatedly, within management which focuses on experiences and which promotes a design "centered on the user" there are many elements that link it to the old analysis of taste and its ways of deciding (2006. Chapter 5)

For the most furious detractors of the blurry aestheticization, the principal criticism of this sort of approach comes precisely from the aesthetic categories used. If design tradition talked about questions like that which is agreeable –in design– contrasted with the sublime –in Fine Arts– even the decorative as compared to the impressive –as in the case of William Morris but also ultimately of all aesthetic modernism at the beginning of the 20th Century– currently, having definitively consolidated the idea of a falsified aesthetic experience –Adorno's critique of industrial culture and the popular in art, but also Heidegger's critique of all non-authentic life in the contemporary technified world– the aesthetic category that is now on the table is entertainment, diversion, and enjoyment. What with that, not all of design's proposals fall into the area of the fun. Just the opposite, in analysis of the blurry aesthetics there are sufficient elements upon which to begin to found an aesthetics that really explains how design operates in relation to the aesthetic and, what amounts to the same thing, in what terms we can speak about quality in such a concrete domain of material culture. Many other authors, those pleased by this surrounding aestheticization and its pleasures, argue for "an intellectual sensibility capable of capturing the part of poetry that the quotidian is full of," to paraphrase Michel Maffessoli (2001:57), "taking advantage of life's pleasure as something positive, affirming even the civic virtue of a hedonism of the everyday."

Welsch, for example, left a door open to another, more profound type of aesthetics when he proposed it in epistemological terms, that is, as a way to acquiring fundamental knowledge from the moment that this knowledge responds to "the transformation of the productive processes guided by new technologies and the constitution of reality by the media." The combination of both types as if concerned with two dimensions of one phenomenon assumes the possibility for Aesthetics of design in the fullest sense.

In the perspective specific to design and its philosophy, what we have just stated also has its consequences. The first and most important is that of transferring the key attributes of the aesthetic to design: in an aestheticized world, in an economy based on aesthetic differences, design shares with aesthetics the same blurry condition. This once again brings up the question of quality in design and its determining elements. In effect, having had its global participation in the definition of products recognized since the advent of "hardware," to use the terms of Carmagnola, it no longer constitutes a specifically differential element, a determined and recognizable language that excludes those that are not equal and comparable:

> "It is not an operation, reserved only for one particularly qualified category of the products but also extends itself to modify perceivable elements of all of the production. Design has also become a blurry condition. There's nothing left that's not differentiated, signed, qualified; each product is a star." (1991:139)

Now, if the act of designing is no longer a differential factor between products, that role can be given to the quality of the design, which in fact sets differences of grade between products. We must recognize that in a world of blurry and omnipresent design the question of quality remains, since

old models of good design are obsolete. The hope is now placed precisely upon aesthetics as a discourse and proposal. In a recent book titled "Homegrown Philosophy", Xavier Rubert de Ventós said that we shouldn't forget that, "culture is still that which transforms hard and opaque reality into a symbolic form," and that, "we are at risk of forgetting that in order for a piece of culture to be legitimate, it must have the possibility of being either false or beautiful." The same is true for design as an activity with an important cultural dimension, or potential to create culture. We should admit however that merchandise, or products reified as merchandise, also have multiple dimensions; in the words of both Carmagnola and Marx, "merchandise is always more than mere merchandise: something that overcomes its immediate, banal nature; always showing unexpected aspects" (2001:149). There's no doubt that the current blurry aesthetics offers a boundless field for aesthetic reflection as long as it is taken seriously and as long as we accept as a point of departure the fact that the aesthetic is a human social anthropological dimension and therefore a part of westerners' way of being.[20]

We accept here the challenges launched by both Alain Findeli and Fulvio Carmagnola some years ago trying contribute to a line of investigation which could be summed up as follows. According to Findeli, to contribute to the deep re-thinking of the aesthetic which contemporary philosophy of design needs (1994: 68); according to Carmagnola:

> The task at hand is one of delineating a set of traits, the figure of a possible aesthetics which takes into account production, communication and consumption referring them to the multiple modes of perception. Now the emphasis must be on consumption, the seat of complex perceptive operations related to aesthetic pleasure and usage of goods. Consumption aesthetics should also then be communication discourse aesthetics; based on an experience capable of giving meaning and culture to the everyday (1991:201).

Summing up, understanding how, through design, through its use, consumption and production we can continue to contribute to the production and experience of meaning wherever it consciously intervenes.

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Anna Calvera
8arcelona, June 2006.

Footnotes & References

[1] 8EDA stands for 8ureau of European Design Associations, created in 1969 to promote political measures within the EU that can be in force throughout Europe, allowing all designers to defend their rights as professionals. See www.beda.org

[2] Spanish Law from 7/7/2003, BOE issue number 162; July 8th 2003, p. 26348. European Directive 98/71/CE, European Parliament and Counsel, October 13th 1998

[3] Ministerio de Industria, Turismo y Comercio, Secretaría General de Industria, Dirección Gral. de la Pequeña y Mediana Empresa: "*La Innovación empresarial en España*". Report by Néboa Zozaya. Madrid 2005 [http://www.ipyme.org/NR/rdonlyres/3593719A-8805-4C6C-AB46-EF9A97CD5C88/0/innovacion2005.pdf]

[4] In this sense, it is worth bringing up Findeli's challenge from a relatively recent article: "Aesthetics... for it is doubtless one of the areas of design philosophy that has been less understood during the 20th Century and which calls for serious fundamental reconsideration." See "Ethics, Aesthetics and Design". Design Issues, 10.2, summer 1994: 68. In this book Findeli addresses that fundamental reconsideration.

[5] After Alexander Gottlieb Baumgarten aesthetics became an independent philosophical discipline which studies artistic phenomena and the beautiful, what is known as modern aesthetics. His main work is the two volume Aesthetica (1750-1758).

[6] Schiller: *Cartas sobre la educación estética del hombre*. 8uenos Aires: Argentina, 1981. There are many other available editions.

[7] One of the most clear and insightful explanations of the contemporary world's disdain of philosophy and aesthetics can be found in Carmagnola, Fulvio: *Luoghi della qualità*. Milan: Domus Academy, 1991: 13, 31 and also in *Il consumo delle immagini*, Milan: Bruno Mondadori, 2006: 158. According to Carmagnola this foundational condition of modern aesthetics derives from Schiller, for whom aesthetics and art were "the place of utopia, of liberation from the links to economic and efficient rationality." For a theoretical elaboration of the concept of banality in art and design, the key texts are those by Mendini published by several architecture magazines throughout the eighties as the basis of that period's Nuovo Design. Maffesoli has also reclaimed banality in: "Hay una poética de la banalidad." MAFFESSOLI, Michel: *El instante eterno* (2000). Barcelona: Paidós, 2001: 86. For an aesthetic analysis of Mendini's thematization of banality see: Calvera, Anna: "La dimensión simbólica de los objetos de uso." en Romero de Solís, Diego y Díaz Urmeneta, Juan Bosco: *Símbolos estéticos*. Sevilla: Universidad de Sevilla, 2001: 321-345.

[8] In some cases, that has been a version acknowledged by art history although it has seldom had any effect on aesthetic reflection. In the case, for example, of J. Jiménez's text on what happened at two turns of the century, that one between the 19th and 20th and that one between the 20th and the 21st: "After the Bauhaus, Morris and the Wiener Werkstäte, fashion, furniture, interior decoration and domestic objects became crystallizations of the taste of the masses, vehicles for a new aesthetic sensibility not connected to traditional art's aristocratic elitism." See: Jiménez, José: "Transformaciones del arte moderno" en *D'Art* 22, Barcelona 1997: B3

[9] The reasoning adds, to a large degree, to Walter Benjamin's thesis on the new varieties of impoverished experience. In his time Ortega y Gasset also dealt with this issue in talking about both the revolt of the masses and the dehumanization of art. Scholars who study the contemporary world and the legacy of post-modernism have taken up again this line of reasoning though in order to call attention to the ideological nature of many of those ideas. Among the numerous possible authors, we'll take as an example the following quote by Michel Maffessoli: "The critique of everyday life is precisely that which is not tragic: kitsch objects, the arrangement of interiors... are like so many fortresses built against the feeling of the tragic, that is, against the awareness of death and ineluctability." Maffessoli, 2001: 57.

[10] Here I refer to the version recently explored by Jordi Berrio in relation to the ideals implicit in the notion of design throughout its history. In relation to the last period in the Modern Movement's design, at the time of Ulm's HfG, Berrio remembered that democratic ideal which also inspired graphic design in its evolution: "Through design, the consumer of industrial objects had the opportunity to bring home a number of new objects which had great formal dignity, and which he was able to enjoy in what they had to offer in terms of function (...) design had become a democratic tool and, therefore, a dignifying one, since it equalized citizens in the domain of forms." See: Berrio, Jordi: "El disseny a l'època de la desaparició dels grans relats". Barcelona: *Temes de disseny*, 16 (february) 2001: 114.

There is relatively little bibliography on Ulm's HfG and what this institution meant to the history of design: the most usual references to different aspects scattered in the most diverse texts, which is due in good measure to the fact that Ulm symbolizes the modern in design and is the model for subsequent design, upon which the latter's innovation is determined. See Bürdek, Bernhard: *Diseño. Historia, teoría y práctica del diseño industrial.* Barcelona: Gustavo Gili, 1984: 39-69, 168-214

[11] It is the Infomational Aesthetics trend defended by Max Bense, Ulm professor, continued at first by Abraham A. Moles. Neoplasticism and concrete art, mathematical information theory and cybernetics all played a part in the definition of this line of enquiry of philosophical aesthetics. The progressive discovery of symbolic values in everyday objects lead the investigation toward other areas, like semiotics or rhetoric of the image, leaving design aesthetics in a dead which was only taken up again by Haug in terms of the aesthetics of merchandise and design's compromise with the German miracle. About the influence of Haug in German design culture, see Bürdek 1984: 172-3.

[12] The essays of W. F. Haug which most influenced German design were: *Kritik der Warenäesthetik*, Frankfurt, 1971; "Zur Aesthetik von Manipulation" in *Das Argument*, 25, 1963; "Warenäesthetik und Angst" in *Das Argument*, 28, 1963; "Zur Kritik der Warenäesthetik" in *Kursbuch*, 20, 1970. About the influence of

Haug's theories and the critical thought of the Frankfurt School on Germany's post-war design, see SELLE, Gert: *Ideología y utopía del diseño*. Barcelona: Gustavo Gili, 1975.

[13] See Karen Lisa Goldsmith Salamon: "Design in cultural exchange: issues on identity politics, authentification and ownership." *Pride and Pre-Design, The cultural Heritage and the Science of Design*. Proceedings Book. Spring Conference CUMULUS / IADE, Lisboa, 2005: 447-455.

[14] A usual view of design and design's role in society, inherited, in part, from critical thought but also from Marxist merchandise aesthetics, is the one used by design in its popular sense, that is, the activity responsible for the attention-grabbing appearances of the post-modern, or of the Nuovo Design popularized in the 80s. Let's take this comment as an example: "Merchandise aesthetics or, inversely, the mercantilization of the aesthetic, with the exaltation of design and its telematic broadcasting in detriment of its content." See Duque, Félix: "Informe sobre la posmodernidad: oscura la historia y clara la pena" in Muguerza y Cerezo (eds.) *La filosofía hoy* (1997). Barcelona: Crítica, 2000: 227.

[15] "In this aestheticized version, design is no longer a superstructural condition, that is, a final intervention which adds beauty to function, a soft dress which folds to envelop a hardware of pre-constituted shapes, to become a structural condition of the projecting which influences the characteristics of the hardware in itself." Carmagnola, 1991: 138. The entire chapter 6 deals with this issue.

[16] Carmagnola 2006: 2 "The imaginary (images) constitutes now the aesthetic form on which rests an economy founded on mass communication." The book is devoted to reflecting on "what happens with aesthetics when the realm of beuty and symbols have turned into a direct source of economic value." (7)

[17] Even though Wolfgang Welsch's writings are still hard to find in Spanish, there are several web pages where articles and papers can be consulted. See, for example: "Aesthetics Beyond Aesthetics", *Proceedings of the XIIIth International Congress of Aesthetics,* Lahti 1995, Vol. III: *Practical Aesthetics in Practice and Theory,* ed. Martti Honkanen, Helsinki 1997, 18-37. Revised: November 2002 at: http://www2.uni-jena.de/welsch/

[18] Lash, Scott: *Another Modernity. A Different Rationality*. Oxford: Blackwell, 1999: "Objects in our present condition of society have become signs, no longer symbols, and therefore their meaning is increasingly aesthetic, not cognitive... the particular object therefore has to be judged as aesthetic experience, as part of an event, by a subject as singular, no longer as universal. The experiencing subject knows things in terms of the ontological structures proper to things themselves. Subject is in the world among objects. Subjects no longer know objects –they now experience them." In relation with an economy based on the production of experiences of users/consumers, see: Pine, B.J. and Gilmore, J.H.: *The Experience Economy. Work is Theatre & Every Business a Stage*. Boston: Harvard Business School Press, 1999.

[19] The classic book about this is François Lyotard's *The Post-modern Condition* [1979]. Many other books have been published but the most relevant here are the ones which have tried to explain the consequences of the paradigm of complexity. For a summary of the perspective and aesthetic of the everyday, see: Fulvio Carmagnola: *La visibilità. Per un estetica dei fenomeni complessi*. Milano: Angelo Guerrini, 1989. Carmagnola states, for example, that "the aesthetic dimension has become a discriminating element for both scientific judgments and the choices made by consumers as well as in industry policies (p.23). In his view, the emergence of aesthetics insocial life is what makes visibility possible, that allows for things to become visible, and therefore, mediagenic.

[20] Today the bibliography on this is quite extensive. For a good analysis in Spanish see Norberto Chaves: *El diseño invisible*. Buenos Aires, Paidós 2005.

CULTURAL DIVERSITY IN PRODUCT DESIGN AND PRODUCT USABILITY

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Abstract

This paper discusses the practice of industrial design within the context of the globalisation process, facing the question of cultural diversity. Two perspectives are discussed; the object perspective and the human need perspective. The first one focuses on the current interaction between human beings and the surrounding products as an expression of the reproduction of culture. The object view is seen as a strategic source for designing pleasurable and competitive products based on mass customization. In the human need perspective the importance of designing products for society within a perspective of social and cultural responsibility and commitment will be stressed, so as to enable the promotion of emancipation, sustainable development, improvement of quality of life as well as the cultural identities of individuals and social groups.

Introduction

Since the eighties disciplines such as archaeology, anthropology, ethnology, and sociology hold the view that artefacts play an important role in the appropriation and (re)production of culture. Artefacts represent existing cultural categories. And people flexibly internalize these categories in interaction with objects. People and artefacts continuously create each other, especially during daily routine actions. This specific view on the role of artefacts in people's everyday life has given rise to new research, but only recently the design disciplines take part in this research. As a specific area within cultural studies the interaction between people and products as a cultural phenomenon has hardly been described yet.

In most theories (i.e. Hofstede (1991) Trompenaars and Hampden-Turner, C. (2002) and Laroche (2003)) culture has been defined as a system of shared beliefs, values, customs, behaviours, and artefacts that members of a society use to cope with their world and with one another; and that are transmitted from generation to generation through learning. So, culture is not genetic or defined by birth. Culture manifests itself both in a visible (art, language, etc.) and a non-visible way (habits, preferences, experiences).

Existing cultural models, however, do not provide extensive information about how it can be applied in a meaningful way to human product interaction and hence to the design of products. Thus far, studies on the impact of culture on product design show a rather pragmatic approach by investigating specific objects in specific situations. The danger is that this approach will not lead to a higher-level thinking regarding for instance a new design methodology.

In this paper we try to bring the discussion to this higher level by making a difference between two perspectives an *object* perspective and a *human need* perspective. The first one is the common designerly way of thinking; in order to get immediate design and marketing requirements the current interaction between human beings and the surrounding products as an expression of the reproduction of culture is studied. The object view is seen as a strategic source for designing pleasurable and competitive products based on mass customization. In the human need perspective the importance of designing products for society within a perspective of social and cultural

responsibility and commitment will be stressed, so as to enable the promotion of emancipation, sustainable development, and improvement of quality of life as well as the cultural identities of individuals and social groups. Both perspectives will now be elaborated upon.

The object perspective[1]

'Globalization leads to homogenization of all consumption and behaviour all around the world' is often stated to identify the consequences of a global world.

From the 1980's, the number of multinational companies grew enormously. This growth resulted in an extreme expansion of world merchandise trade and world trade of commercial services. In 2004 the total value of global trading was nine thousand billon euros, of which 2.5 thousand billon euros were spent on international trading of products: office, telecom, automotive, personal & household goods and scientific and controlling instruments (World Bank, 2005).

With the trend of internationalization, products are marketed all over the globe. Cultural diversity is on the decline, would be a logical conclusion. So why should we, as product designers, be bothered by culture at all? We should do, because in this increasingly global market many companies and designers are facing cultural diversity. Products that initially are designed for local markets will be purchased and used in different parts of the world in a different economical and cultural context. As a consequence, there is an emerging interest in the impact of cultural dimensions on the interaction between people and products, both from a professional and an academic point of view (Christensen et al., 2006).

More and more important is which role a product plays in an international context. Is a product only suitable for one specific context only? Or are there products acceptable no matter which context they are in? The older the product category the more cultural manifestations it has (de Mooij, 2004). Although the alignment of product designing with corporate guidelines and international trends is noticeable, the symbolic, practical and technical requirements vary among cultures, demanding product differentiation (Ono, 2005).The statement of Percy Barnevik, CEO of ABB 'think globally, act locally' is all we have to do while acting in an international perspective whether one want to solve a conflict, to sell things, and also to develop products for the international market. Although the statement is very simple, the consequences are rather complex. So it is for product design.

No wonder that companies realize the importance of flexible and adaptive design according to local markets. A company's failure to acknowledge cultural differences often limits its product's marketability. Therefore, a number of global companies already started to develop methods and projects to study cross-cultural aspects. Intel developed his own 'Culture Capsule', a physical cultural environment that can simulate every cultural interior and atmosphere you like (Foucault and Russell, 2004). Microsoft, Hewlett Packard, Philips and Siemens, among others, are conducting cross-cultural studies to understand not only matters regarding culture and human interaction design but also how to gain profit from emerging markets.

From this object perspective human beings are perceived as *users* irrespective their needs for the manufacturers' artefacts. Cultural-specific variables are related to users' expectancies about usability. Depending on their cultural background, users may focus on aspects concerning effectiveness, efficiency or satisfaction (or combinations of each) when using such products. Therefore, assuming there is a linkage between culture and attitude towards usability, products should be modelled to the user's local cultural background in terms of producing systems that accommodate user's cultural characteristics (Diehl and Christiaans, 2006).

Illustrative cases

To illustrate the broad spectrum of products involved with cultural diversity and similarity, some specific product cases are presented here.

With many people interested in cultural diversity regarding the field of product design, the discussion if culture is a factor

[1] We want to thank Kamiel de Leur for his contribution to this section of the paper.

of importance is still going on. The iPod family (see figure 1) proves that the physical appearance of a product doesn't have to be different to be a success. But also the iPod is a highly diverse product, affected by the factor culture: the music on the iPod defines its cultural identity.

Figure 1. I Pod Family

The physical appearance (apart from some colour trends and promotional prints) of the ball pen differs not much in the world (see figure 2). The function of it is cultural neutral, but not the output. This product works around the world because the person who is writing with it is able to express his cultural knowledge (language).

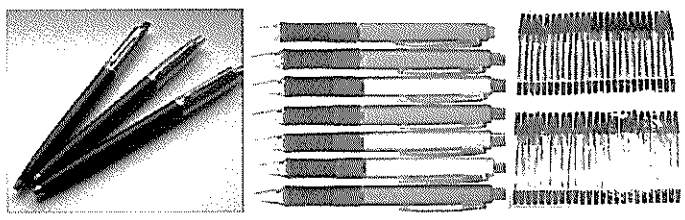


Figure 2. Ball pens

The kitchen environment is always a nice example for cross-cultural issues (see figure 3). Here we can see the 'western' style sink and the 'Central America' sink. Apart from the use, in Central America they also do the laundry in the sink, the functionality and appearance differs. In Central America, each sink includes three compartments: one water reservoir in the middle and two 'workplaces' (suitable for all kind of activities). Due to the environmental circumstances there is no constant water supply.

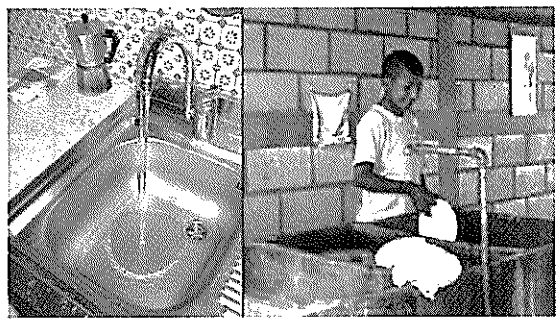


Figure 3. Western style and Central American style sink



Figure 4. Heating in Japan

The way of heating your house is different from region to region. Here in Japan, the low table (also used as a dining table) incorporates a heating device inside. Covered with a blanket and a glass plate, people are able to sit under the blanket and experience a comfortable temperature (product suggestion: TWA Tokio).

Asia versus Europe

Another illustrative example can be presented by comparing some objects in Asia versus Europe (see figures 5, 6 and 7).[2]
Figure 5. Cultural differences between Europe and Asia in eating tools and appliances to wash clothes.

[2] With thanks to TWA Tokyo and TWA Singapore for their product suggestions.

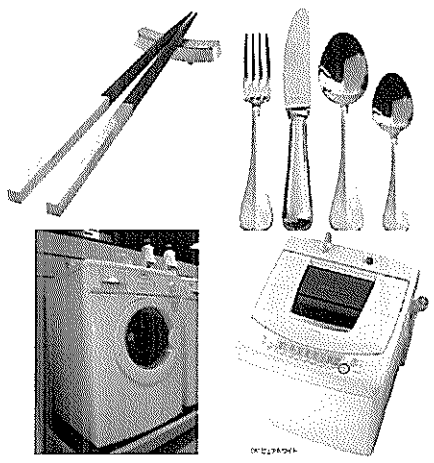


Figure 5. Cultural differences between Europe and Asia in eating tools and appliances to wash clothes.

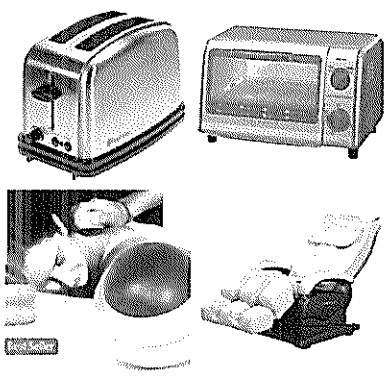


Figure 6. Cultural differences between Europe and Asia appliances to toast bread and appliances to get massage.

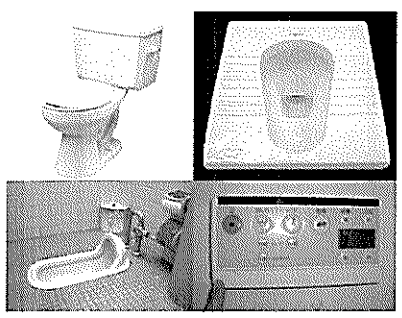


Figure 7: Cultural differences in tools in the restroom

At the School of Industrial Design Engineering, Delft University of Technology, the Netherlands a series of case studies have been initiated to explore cross-cultural design from the object perspective. These case-studies are meant to gather as many examples as possible as to form a coherent view on what people moves, their experiences and, above all, the needs regarding their own responsibility in creating their own favourite environment. Current design methodology apparently is based on this object view also in tackling cultural diversity in product design. Starting from existing products, for instance designed for people in a western country, any need for adaptations in other cultures will be translated into adaptations to the existing product (see the case below). Another way is to offer a number of alternatives for the same product and to test people's preference. The design of a water purifier by a western company is an example of this strategy. People in India were offered a metal and a plastic one. For typical cultural reasons they preferred the metal purifier notwithstanding the higher price.

Case study influence of culture in consumer electronic products

By this case an exemplar of the object perspective will be presented. In this study cultural differences were studied on the basis of a comparison between two cultures, the Netherlands and South Korea on design characteristics of consumer electronic products. People are not always aware of the influence of culture on their daily life. So, survey methods alone will not reveal their values and beliefs in relation to the material world. Therefore, a new method was developed to capture these culture related preference for the design and style of a product and its user interfaces. The method, called 'Design it yourself' method (D.I.Y.), makes it possible for the user to design the interface of his/her preferred microwave and washing machine. While expressing their own preference during the test, it was believed that common attributes to their culture could be obtained.

The D.I.Y tool was a computer-based simulation of the microwave and the washing machine, made in Flash, with which the participant can move all separate parts (window, buttons, pictograms, and text) in order to design his/her favorite interface (see Fig. 8). Participants also had to choose a sound (out of 10), which is heard when a cooking program ends. Examples of microwave designs are presented in Figure 8. Analysis of the microwave interface designs shows differences

between Dutch and Korean people on a number of aspects: shape and arrangement of buttons, and the reason for their preference. Dutch participants preferred symmetry shape of button and symmetric arrangement while these were not the case with Korean participants. Both good-looking and usability were important to Dutch subjects while only the usability was most important to the Korean group. On the other hand, there were no differences on the size of buttons, indication, type of control, complexity on arrangement, and hierarchy.

Use patterns were analyzed by looking at the displacement of the hand while operating the microwave on participant's designs. For this evaluation, a simple task was imagined, i.e. 'heating-up'. To do the task, people generally follow the sequence: watt control, time control, and start. Looking at the operation of Dutch participants three patterns, almost evenly distributed, were found: 'from top to bottom', 'going up and then down', 'going down and then up'. The patterns of the Koreans showed the distribution: 'from top to bottom', 'going up and then down', while the pattern 'going down and then up' did not appear at all. Differences were found in the choice of an 'ending' sound. Dutch participants did not show any uniform preference. Among the various reasons for their preference functionality of the sound was most frequently mentioned. Contrary the Korean group showed this uniformity. 'Nice to listen to' was the reason for this preference (Kim et al., 2006).

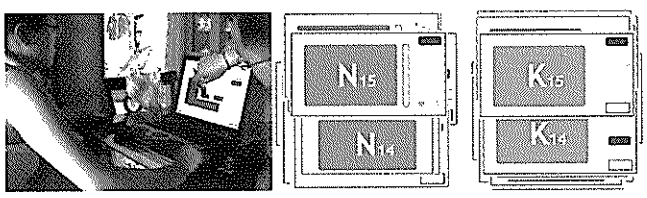


Figure 8. Participant using the Design-It-Yourself tool and the outcomes of the Dutch participants (N15) and the Korean participants (K15)

The human need perspective

Talking about human product interaction the usual way to tackle this issue from a designer's point of view is the object perspective, followed by a market perspective. This view, which is taken for granted by economic rationalists, assumes that human beings are driven by a limitless craving for material possessions (Fisher, year unknown). The designed objects stemming from this way of thinking provide relatively specific, sometimes sophisticated offerings to a narrow range of people. However, in this view the human interest, needs and believes hardly play a role. Therefore an human need perspective should also taken into account, not by giving this issue only lip-service, offering the traditional western view of Maslow's hierarchy of needs (Maslow, 1962). This hierarchy doesn't exist apart from the basic need for subsistence or survival. Designing products for society within a perspective of social and cultural responsibility and commitment, should emphasize the promotion of emancipation, sustainable development, improvement of quality of life as well as the cultural identities of individuals and social groups. The author who takes a stance in the discussion about human needs is Max-Neef. His model of human-scale development can offer a breakthrough in our way of thinking about material culture.

The Max-Neef model of human-scale development

Max-Neef and his colleagues have developed a taxonomy of human needs. Human Scale Development is defined as "focused and based on the satisfaction of fundamental human needs, on the generation of growing levels of self-reliance, and on the construction of organic articulations of people with nature and technology, of global processes with local activity, of the personal with the social, of planning with autonomy, and of civil society with the state." (Max-Neef et al, 1987; p. 12)

Max-Neef makes an important distinction between needs and satisfiers. Human needs are seen as few, finite and classifiable (as distinct from the conventional notion that "wants" are infinite and insatiable). They are constant through all human cultures and across historical time periods. "What changes over time and between cultures is the way these needs are satisfied. It is important that human needs are understood as a system - i.e. they are interrelated and interactive" (Fisher, year unknown).

Max-Neef classifies the fundamental human needs as: subsistence, protection, affection, understanding, participation, recreation (in the sense of leisure, time to reflect, or idleness), creation, identity and freedom. Needs are also defined according to the existential categories of being, having, doing and interacting. From these dimensions, a 36 cell matrix is developed which can be filled with examples of satisfiers for those needs.

Fundamental human needs	Being (qualities)	Having (things)	Doing (actions)	Interacting (settings)
subsistence	physical and mental health	food, shelter, work	feed, clothe, rest, work	living, environment, social setting
protection	care, adaptability, autonomy	social security, health systems, work	co-operate, plan, take care of, help	social environment, dwelling
affection	respect, sense of humour, generosity, sensuality	friendships, family, relationships with nature	share, take care of, make love, express emotions	privacy, intimate spaces of togetherness
understanding	critical capacity, curiosity, intuition	literature, teachers, policies educational	analyse, study, meditate, investigate,	schools, families, universities, communities,
participation	receptiveness, dedication, sense of humour	responsibilities, duties, work, rights	cooperate, dissent, express opinions	associations, arties, churches, neighbourhoods
leisure	imagination, tranquillity, spontaneity	games, parties, peace of mind	day-dream, remember, relax, have fun	landscapes, intimate spaces, places to be alone
creation	imagination, boldness, inventiveness, curiosity	abilities, skills, work, techniques	invent, build, design, work, compose, interpret	spaces for expression, workshops, audiences
identity	sense of belonging, self-esteem, consistency	language, religions, work, customs, values, norms	get to know oneself, grow, commit oneself	places one belongs to, everyday settings
freedom	autonomy, passion, self-esteem,, open-mindedness	equal rights	dissent, choose, run risks, develop awareness	anywhere

Table 1. Taxonomy of human needs (Max-Neef, 1987)

Fisher writes: "Max-Neef shows that certain satisfiers, promoted as satisfying a particular need, in fact inhibit or destroy the possibility of satisfying other needs: eg, the arms race, while ostensibly satisfying the need for protection, in fact then destroys subsistence, participation, affection and freedom; formal democracy, which is supposed to meet the need for participation often disempowers and alienates; commercial television, while used to satisfy the need for recreation, interferes with understanding, creativity and identity - the examples are everywhere. Synergic satisfiers, on the other hand, not only satisfy one particular need, but also lead to satisfaction in other areas: some examples are breast-feeding; self-managed production; popular education; democratic community organisations; preventative medicine; meditation; educational games" (Fisher, year unknown).

This model forms the basis of an explanation of many of the problems arising from a dependence on mechanistic economics, and contributes to understandings that are necessary for a paradigm shift that incorporates systemic principles. Max-Neef and his colleagues have found that this methodology "allows for the achievement of in-depth insight into the key problems that impede the actualisation of fundamental human needs in the society, community or institution being studied" (Max-Neef et al, 1987:40)

This model provides a useful approach that meets the requirements of small group, community-based processes that have the effect of allowing deep reflection about one's individual and community situation, leading to critical awareness and, possibly, action al the local economic level.

What does it mean for product design?

Creating products for people requires the understanding of the needs and context of the people within it. In this situation it is clear that researchers and designers should engage with cultures directly in order to better understand local people. A unique set of design and business tools and practices adapted from social anthropology, ethnography and Participatory Rural Appraisal (PRA) to build what we call an MNC's "native capability" are being used. This native capability consists of the ability to:

- Engage in deep listening and mutual dialogue with income-poor communities.
- Co-discover and co-create new product design opportunities and business models embedded in the local cultural infrastructure.
- Co-design and launch products that generate mutual value for all partners.

Researchers from the Faculty of Industrial Design Engineering at Delft University have adopted this approach. Another paper at this conference gives an overview of this research (Diehl and Christiaans, 2007).

Conclusions

Studying the consequences of cultural diversity for product design we are used to give priority to an *object* perspective: how can we adapt products designed and manufactured in the western world to a global market; how can we increase product selling to a bigger population; what marketing strategies are effective? Even in the current research practice a new research vocabulary is 'invented', such as 'research through design', which give the impression that researchers and designers only have an eye for this kind of reasoning. This perspective leads to a reproduction of particular values, thereby maintaining the status quo and neglecting the real needs and satisfiers hold by people from different cultures. Therefore, another perspective is badly needed, one that emphasize the creativity of people in contributing to their satisfiers, the promotion of emancipation, sustainable development, improvement of quality of life as well as the cultural identities of individuals and social groups.

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DANCING WITH DESIGN - A STUDY OF THE NATIONAL DESIGN POLICY AND DESIGN SUPPORT PROGRAMMES IN SOUTH KOREA

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Abstract

This paper summarises a study of the national design policy, the current status of the design industry and related support programmes offered by the government in South Korea. Government support programmes for Small and Medium Sized Enterprises (SMEs) are analysed based on a questionnaire survey. Seven key recommendations for support programmes and the national design policy are identified as follows: (1) Improving PR in relation to the national design policy and related design support programmes, (2) Developing different support programmes for Medium sized (ME)s and Small Enterprises (SE)s, (3) Developing the support programmes more practically, (4) Improving the quality of design consultancies and subdividing them into specific fields of design consultancies, (5) Providing practical education and training programmes for designers and Chief Executive Oficers(CEOs), (6)Re-considering the main operator in support programmes and (7) Raising the value of the 'Good Design' award and its globalisation.

Introduction

The global economy and environment has changed rapidly and competitive pressures are continuous. Although most countries would like to expand their business to overseas markets, it is increasingly difficult to achieve their goals within the different environments of the global market place (Blaich 1988; Phillips 2004). Therefore, most countries have established different strategies to enhance competitiveness and economic success throughout the world, and many believe that using design effectively is central in achieving these aims (NAEH 2003; Phillips 2004; Tether 2005; DTI 2005b). The Design Council (Design Council 2004a) reported that design-led companies have produced dramatically increased share-price performance for their investors, and 63 of 166 design-led companies outperformed the FTSE 100 index over the full period by 200% which indicates (Design Council 2005e) that design-led innovation is their principal competitive weapon in global markets. Moreover, the importance of design is emphasised in the Cox review (HM Treasury 2005) as *the major impact of design innovation service on technology companies*. The design for business programme in the UK (HM Treasury 2005) has produced impressive results as follows:

- 80% of the companies changed strategic direction, mindset, culture and vision
- 75% of the companies invested significantly in design and are confident of a return on investment
- 65% of the companies changed branding and communication
- 50% of the companies increased their ability to raise investment finance, significantly changed the balance and composition of the company's skills and saw better management and reduction in commercial risks

Just as businesses seek to maximise their revenue, so do nations seek to maximise their economy and are subject to much of the same type of constraints that individual businesses face (NZIER 2003). It is therefore necessary to discuss *how best to improve promotion of design across businesses and governments*, which is directly related to the general aim of national design policies (Hytonen and Heikkien 2003). In general, national specialisation focuses on national strengths and competitive competencies; they are often different nation-by-nation but also important in global competition (Hytonen and Heikkien 2003). The same can be said for design policy between nations.

In this paper, the design policy and support programmes for SMEs (Small & Medium Sized Enterprises) in South Korea have been studied. This paper consists of three parts as follows. Firstly, the development of design policy in South Korea is briefly described. Secondly, satisfaction levels of SMEs on the support programme, which is a part of the design policy, are surveyed and analysed. Finally, recommendations for improvements to the support programme as well as the direction of the design policy are discussed.

Overview of the national design policy in Korea

National design policy development in Korea started in the late 1950s and, since then, the Korean government has operated diverse design strategies in conjunction with the national economic development (KIDP 2005b; Kim 2006). The national economic background has dramatically improved arising from governmental intensive support for light industries (1960s), heavy industries (1970s), assembling and processing industries (1980s) and IT industries (1990s~present). In 2003, knowledge-based industries, which include intelligent home networks, futuristic automobile, robot and design, etc. as a driving force for the 21st century, were selected by the government (Cho 2004; Kim 2006). According to the Korea Institute of Design Promotion (KIDP 2005b), the 1950s, in terms of the design history of Korea, was the commencement of awareness of the importance of the handicraft industry and design. It is called the 'Era of Reviving the Handicraft Industry' and Korea undertook design strategies through the '*Korean Handicraft Demonstrations Centre*'. From the 1970s, the Korean government has evolved design promotion with the establishment of the '*Korea Design & Packaging Centre* (KDPC)'. The design policy for design promotion began in earnest in the 1990s when the 'Era of Vitalising the Design Industry' was established and KDPC was renamed the '*Korea Institute of Design Promotion*' (KIDP). In recent years (2000-Present), the 'era of Globalising Korea Design', the Korean government has been endeavouring to globalise Korean design.

Major government initiatives

In Korea, formulation of design policy is mainly accomplished by the Design and Brand Policy Division in the Ministry of Commerce, Industry and Energy (MOCIE) (Kim 2006). The aim of MOCIE is to help industries best utilise design to enhance their competitiveness. MOCIE has announced a design policy at the end of each year since 1998. KIDP was founded by MOCIE in 1970 and is responsible for implementing policy. The aim of KIDP is to revolutionise the export structure of Korea by promoting the field of design. KIDP has been engaged in various activities to assist in the advancement of the Korean design industry. The objectives of KIDP are to contribute to the development of the national economy and to improve the quality of life for all Korean citizens (KIDP 2005d). KIDP intends to achieve the objectives through promoting R&D activities pertaining to design and implementing projects to promote design in effective and systematic ways.

Five-year plan for industrial design promotion

The Korean government launched a long-term plan in 1993, consisting of three five-year design promotion plans, for design promotion up until the present day. In the period of the first five-year plan for industrial design promotion (1993-1997), the number of designers and design firms grew explosively. The investment in design development for SMEs

has also incredibly expanded (details are explained in the next section: current status of the design industry). The focus of the first plan was to raise design awareness and to nurture corporate design abilities (MOCIE 1993).

In terms of the second five-year plan (1998 – 2002), when faced with the economic crisis in 1997, Korea turned to an innovation and design focus to extract herself from economic decline. The main aim of the second plan was to inspire designers to expand their creativity and enhance the quality of Korean design. The government established the Korean Design Centre to expand international activities, including hosting ICSID 2001 Seoul and Icograda 2000 Seoul, and to set up design innovation centres in major universities (MOCIE 1998).

In the third five-year plan (2003–2007), the government keenly acknowledged the central role design plays in the nation's competitiveness. The government has been trying to strengthen design R&D capabilities, to build regional design centres and to achieve the vision of 'Design Korea' during this period (MOCIE 2003b). This five-year plan aims to promote the design industry and to systematically make Korea an industry hub in the East Asian region. To realise a national user-oriented design plan, the plan was finalised after going through public hearings and listening to opinions of design experts. The major programmes of the plan can be categorised into six areas: (1) to broaden the base of design industry, (2) to introduce various measures for the education of "star" designers, (3) to establish the local design innovation system, (4) to strengthen design R&D capabilities, (5)to improve the national image of Korea, and (6) to expand international design exchange and to strengthen cooperation in Northeast Asia (MOCIE 2003b).

Current status of the design industry

The current market value of the design industry in Korea was estimated at approximately 7 trillion Won (£3.9 billion, 1.2% of GDP) in 2002, and it is expected to rise to approximately 36 trillion Won (£20 billion, 3% of GDP) by 2010 (MOCIE 2003b). Based on the three five-year promotion plans, the Korean government has a vision to move their design ranking up to 7th position in terms of design-led countries by 2008 and 5th by 2015(KIDP 2005c). The level of Korean design quality was estimated by the KIDP to be equivalent to 80% to that of the design powerhouses of the world (KIDP 2004a). The target areas of MOCIE's design policy include all the design disciplines except fashion, textiles and architecture. In this paper, the current status of *design awareness, supply & demand of human resources, education, design consultancies, design development by companies, design competitiveness and reconstruction of infrastructure* are summarised. Note that the statistics and figures referred to in this part of the paper are from Korean Design Industry Research 2005 report (MOCIE and KIDP 2005d) and were the results from a questionnaire survey which targeted 120 self-governing bodies, 2,200 general companies and 500 design consultancies.

Design awareness in Korea

In general, it is perceived that people have high standards of design awareness (KIDP 2006d). They believe that design is a crucial element for the improvement in the national economic growth and also increase their cultural standard and quality of life. The national budget for design is, however, reducing. The R&D budget for industrial technology development of MOCIE in 2005 was approximately 50% of the whole R&D budget of MOCIE (MOCIE 2005b) but the R&D budget for design was merely 1.1% (Kim, Seo et al. 2005). Additionally, the R&D budget of government had been increased by approximately 20% from 5,577 billion Won (£3.1 billion) in 2003 to 6,737 billion Won (£3.8 billion) in 2005 whilst the R&D budget for design had been reduced from 1.8% (2003) to 1.5% (2004) and then to 1.1% (2005) (Kim, Seo et al. 2005).

Supply & demand of human resources

As of 2002, there are a total of 256 schools (125 colleges and 131 universities) in Korea, where 539 departments teaching diverse design disciplines exist. The number of people who graduated from design related universities and colleges has increased from 28,583 in 1998 to 36,397 in 2002, which is up by around 27% over the past five years (KIDP 1998; KIDP 2002a). The current problem for the design industry in terms of human resources is an unbalanced supply and demand in both quality and quantity of design. This industry finds itself having a lack of professional resources, as it needs more designers of a higher calibre, to respond to the advanced design of cars, electric home appliances, furniture and IT

environment. However, the majority of designers tend to major in visual, packaging and product design (KIDP 2004a; Hong 2005; MOCIE 2005c; Ahn 2006).

Education

Design has become one of the key sectors attracting public attention, and the educational demand has been continuously growing. Although academic disciplines such as management and engineering are increasingly paying attention to the potential role of design in their field, design is mainly perceived as an applied art in Korea. Design education in Korea still focuses on practical art skills, and there are few connections to marketing, engineering and management related areas. Bearing in mind that the average period of field adjustment of graduated manpower is around 9.5 months, design consultancies and companies have responded that design education in university produces graduates who are not good enough for practical work, and 69% of domestic SMEs cannot retrain their designers due to a lack of budget and human resources (MOCIE 2004a; MOCIE 2005c).

Design consultancies

The total number of design consultancies in Korea in 2005 was 2,245, and 39.3% of the consultancies were in the visual communication sector while 25.1% were in environment and 24.1% were in product. This illustrates how the industry is heavily biased towards a visual field (MOCIE and KIDP 2005d). The average number of employees per consultancy is 3.79, and over half of the consultancies (58.6%) have only three to four employees. This indicates that most design consultancies are likely to be small-scale enterprises (MOCIE and KIDP 2005d). The market size of the design industry for design consultancies was approximately 1,308 billion Won (£732 million) in 2005. Whereas more than 80% of large sized companies have in-house designers and procure outsourced design from overseas design consultancies (FKI 2005).

Design development by companies

22.4% (38,384 out of total 171,356) of general companies operate design work and provide manufacturing, construction, business, entertainment, culture and sports services. A number of companies have in-house design teams or designers (14.2%, 24,333), and a minority of companies use outsourced design (8.2%, 14,051) (MOCIE and KIDP 2005d). The average number of designers in a company is 4.24, and in total about 100,000 designers work for these firms. On average, the annual design budget for general firms is approximately 148 million Won (£83 thousand) and the estimated total value is 5,709 billion Won (£3.1 billion). 31.6% of the design budget was spent on personal expenses and 26.2% was spent on outsourcing.

The average amount of investment in the design field compared to the total sales market for manufacturing companies in Korea is merely 0.5%, while it is 0.2% for Large-sized, 1.2% for Medium-sized, and 2.1% for Small-sized companies. An average investment for R&D in the manufacturing industry is 12.4%, while it is 9.6% for Large-sized, 2.1% for medium-sized, and 13.6% for small-sized companies. The ratio of R&D investment to design investment of companies indicates that the proportion of investment for design is still minimal within a company.

The main decision maker for design selection in general companies is the CEO (64.5%), design team-leader & design specialists (25.0%) and feedback from consumers (6.9%). In manufacturing fields, the CEO (70.2%) is the main decision maker and is remarkably higher (more than 10%) than any of the other fields. This result shows a lack of speciality in design, and is perceived as an impediment to the development of Korean Design.

Design competitiveness of Korean products

As measured by staff in charge of sales and marketing at Korean firms that export their products, design competitiveness of products designed in Korea is, on average, estimated to be 3.11 points on a five-point scale. Functionality & Convenience, Safety, and Economy received high marks while Creativity & Innovation and Environmental Concerns received low marks (KIDP 2002). It is suggested that Korea lacks the capability of harmonising high technology with a sensitive design (KIDP 2004a).

Reconstruction of infrastructure

There are two initiatives at regional level; Regional Design Centres (RDC) and Design Innovation Centres (DIC). RDCs

have been in operation since 2002 and will run until 2007, and three RDC will be built in KwangJu, Busan and DaeGu. The intention of this is to form a close cooperative system within the municipalities to ensure that the RDC is built within the construction schedule and operates as a design promotion facility and satisfies the requirements of the local industries and economy (KIDP 2006e), whilst DICs are to further identify the functions and roles of 15 DIC's already installed and operated at local universities in 2004. Their role is to provide an infrastructure and to support design innovation of each region.

Support programmes by government

An explanation of the operative programmes for design promotion by KIDP is described in the *Internal manual of current operative programmes* (KIDP 2006a), and the *Report on the National Design Policy in Korea* 2004 (KIDP 2004a).

There are various design support programmes for design industry in KIDP. The current programmes basically consist of (1) Funding support: *Design Innovation programme, World-Class Design & Brand Support Programme, Develop Design Related Materials & Surface Treatment Technology, Building Technological Innovation Capacity of SMEs by Design Technology Development, Supporting SMEs Exporting Promotion, loan service for the industrial Technology Development*, (2) Consulting: *Design Home Doctor*, (3) Design awards: *Good Design (GD), Success Design, Korea Design Award (Industrial Design Promotion Convention)* (4) Selecting design: *Top Design Consultancy, Industrial Design Company Report System*, (5) Support for design: *Design Fundamental Research*, and (6) Operating design: *Design Experience (DEX) Centre*. Almost all of the funding support programmes provided are especially for SMEs.

Design innovation programme

The Design Innovation Programme is one of the main programmes for reinforcing the innovative power of corporate design (Kim 2006), and has operated as a growth engine for SMEs (KIDP 2004b). The programme has been conducted since 1994 based on the Five-Year-Plan for Industrial Design Promotion. The aims of this are to enhance industry's competitiveness and create a higher value-added business through the development of design, as well as to construct infrastructure for sustainable growth in design through enlarging investment in design and disseminating design management guidance. The programme is a service available to any company which has difficulties with either the design development process or financial resources. It is considered as a bridge between design firms and SMEs. The scheme is to provide a fully-fledged service from design development to commercialisation.

The programme supports both design consultancies and SMEs. Design consultancies, which have been selected as the top design consultancies in the last three years by KIDP, are eligible for support from the project. SMEs who are trying to achieve a higher value added business, through the use and development of creative design, are eligible for support. In particular, the programme specifically supports firms which have been selected because of an ability to demonstrate good design, export products, produce world-class goods, and procure products for government.

The areas supported by this programme are Product Design, Brand Design (brand naming also can be supported when it is developed with brand design), Package Design, Animation Design and Visual Design which includes the development of website, catalogues (e-catalogues) and Corporate Identity design. The limit for the financial incentive is approximately 55,000 per year, which covers two-thirds of a total design fee for design development and the firms are responsible for the remainder usually (one-third of the total fee). If and when the project is evaluated to be successful and profitable, the firms have to pay back a certain percentage (20% of the total fee for SMEs and 40% for big companies) of the incentive as royalty to the government.

This programme is annual and starts with the announcement of each year's plan by MOCIE and KIDP. Companies apply to KIDP to participate in the programme. KIDP selects the most suitable design consultancies, and the project is undertaken after the firms and design consultancies agree with the design process. The KIDP has the responsibility for managing results and financial support during the project, evaluating the outcomes and charging any royalties to SMEs at the end of the project.

A total of 7,726 projects were carried out through the programme from 1994 to 2005 of which 54.5% of them have

been commercialised. They regularly need six to twenty-four months for commercialisation. The number of projects in 2005 was 414 which consist of product design, package & visual, brand & character and integrated support. The sales of the 43 companies which have had success in design in 2005 increased by 85% and exports also increased by 47% than before developing design.

A study of satisfaction with the design support programmes amongst SMEs

In order to investigate the impact and satisfaction amongst SMEs of the level of government support provided in design, the programmes described above were investigated in a questionnaire survey conducted between the 28th of August and the 22nd of September 2006. The results of seventy-one respondents, who work for the four hundred and nine SMEs in Korea which had participated in the support programmes, in particular, the '*Design Innovation Programme*' by KIDP in recent years, are described below.

The SMEs are defined as having less than 300 employees according to the SMEs legislation in Korea (KFSB 2006). Most respondents of the survey had managed the development of design during the programmes. The data was analysed as a whole and then by firm size, location, existence and non-existence of in-house designers. In this paper, the firms have been categorised as Medium Sized Enterprises (MEs) and Small Sized Enterprises (SEs) which have less than 50 employees, and are located in the capital city and area surrounding the capital city as well as regional cities. Prior to implementing this survey, an interview was conducted as a pilot survey which involved in-depth interviews with nine people from SMEs to obtain general ideas and personal practical experiences. The contents of the survey are divided into four parts: (1) Awareness of Design, (2) Awareness of the national design policy, (3) Satisfaction with the support programmes by the government, (4) Additional information and suggestions.

Awareness of design

The results indicate that most people are aware that design is an important competitive tool for firms and that it has a role in enhancing all aspects of business performance, and they believe that the effects of investment in development of design are an *increase in sales* and *rise in brand value* (see Figure 1). The time when respondents started to become aware of the importance of design differs according to the firm size, however, overall it is reported as being when the sales of their product increased after the development of design for MEs (55%). Whist awareness of the importance was found to be pre-existing and continuous for SEs (52%). The most important criterion for the investment in design amongst MEs is *the awareness of the board of management regarding design* (45%) and *the cost of design development* (45%) while in SEs, it *is the cost of design development* (50%) and *the confidence in the result of design* (50%). For MEs the biggest challenges when their companies invest in design development are *the cost* (55%) and *the lack of confidence of the result* (36%); however, for SEs, it is mainly *the cost* (79%).

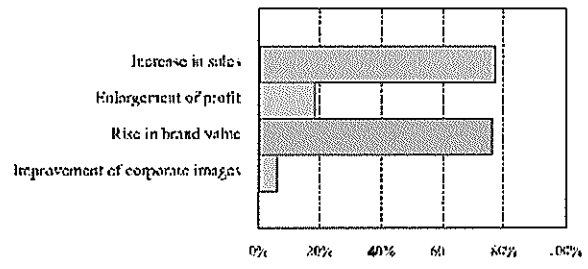


Figure 1. The effect of investment in development of design

Awareness of the national design policy

The results here indicate that even though most programmes are operated for SMEs and they have participated in the programmes in recent times, the respondents did not know the national design policy and design support programmes very well. As can be seen from Figure 2 below, the main way for both MEs (82%) and SEs (52%) to encounter design is through *deign consultancies*, rather than PR by KIDP. Around 60% of respondents think that the most well developed part of the support programmes is supporting companies especially with funding. The results of two questions: *the area which should be mainly improved in design policy, and the area which should be mainly supported for the development of design are education and training programmes* (55% and 45% respectively for each question) for MEs, while supporting companies (55% and 54% respectively) for SEs obviously because of financial difficulties they often face (see Figure 3).

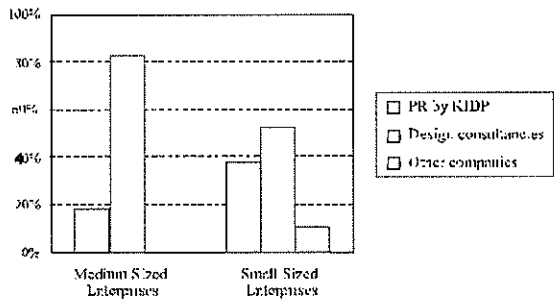


Figure 2. The way SMEs find out more about national design policy

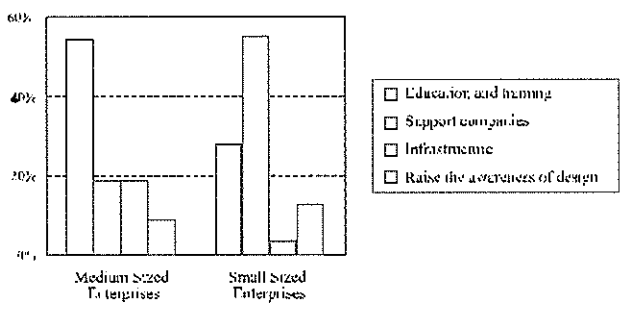


Figure 3. The area which should be mainly improved in design policy

Satisfaction with the support programmes from the government

According to the results of this survey, the SMEs which had joined the design support programmes by KIDP invest approximately£20,000 on average per annum on design. The investment proportion of design to technology is around 8%. The companies which had participated in the programmes are generally satisfied but the response of satisfaction or dissatisfaction is somewhat different depending on firm size and location.

The way in which the SMEs have joined in the programmes is mainly through *suggestions by design consultancies*. There are various support programmes for SMEs in KIDP, and they had participated in *the Design Innovation Programme* (83%), *Supporting SMEs exporting promotion* (19%), *Good design selection* (17%), and *World-class design & brand support programme* (8%) etc. Looking at MEs in contrast to SEs, participation in the *Design Innovation Programme* is almost the same (82% and 83% respectively) whilst the second biggest participation for MEs is *World-class design & brand support programme* (18%), and the SEs' opt for *Supporting SMEs exporting promotion* (23%) (see Figure 4). These results are generally the same for the programmes the companies indicate that they want to apply for in the future.

The main impact of participation in the programmes is a *rise in brand value and corporation images* (76%) and an *increase in sales* (47%) in domestic and in global markets. Respondent satisfaction with the funding support programmes by KIDP indicate that first, most respondents were satisfied with the *amount of funding* (83%), and *the application process and method* (84%), only 61% of respondents were however, satisfied with *the result of the development of design*. The reason for dissatisfaction with the outcome is related to *poorly qualified design consultancies*. Second, 54%, and 60% of respondents were satisfied with *the actual duration of the process and the process of the development of design*. Those respondents who were dissatisfied mentioned that the duration of KIDP programmes are fixed, but actually the required duration is different depending on the tasks and products. The process is, furthermore, only perfunctory and non-professionally organised and communication with design consultancies is also difficult. Third, 66% of respondents were satisfied with *the design consultancies* but 12% reported dissatisfaction due to *lack of knowledge of the products* which have to be developed (67%), and dissatisfaction with *the outcome of design* (33%). The funding support programmes currently operate within design consultancies as main operators and general companies as participants. Over 50% of respondents argued that SMEs should be the main operators of the programme because the companies participating are supposed to be the real beneficiary of the programmes and they should be able to choose appropriate design consultancies for their development of design, but 32% still opted for design consultancies as custodians of the design programmes.

In response to questions on the effects of the award 'Good Design' and 'Success Design', it was responded that impact was on *improvement of corporate images* (40%), *increase in brand value* (33%), *increase in sales* (7%) and *no effect* (19%). However,

50% of respondents in MEs mentioned that there was *no effect with the award*. The reason for this is that *consumers did not contemplate the award when they purchased (60%)*, or *that the award of Good Design was biased towards products of specific areas and firms* (20%).

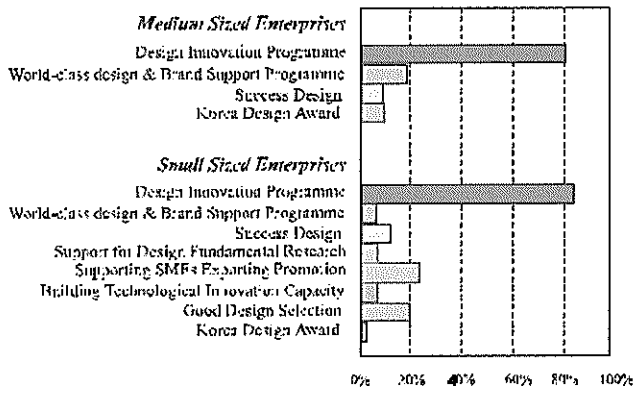


Figure 4. The ratio of the support programmes by KIDP which SMEs had participated

Additional information and suggestions

In addition to the questionnaire items, the respondents were quite vociferous in commenting and provided additional information and suggestions with regard to current support programmes. The main reasons offered as to why most SMEs do not have in-house designers were (1) *heavy load of personnel expenses*, (2) *there are not many tasks for the development of design* and (3) *the companies essentially work with design consultancies*. Many respondents reported that the firms located in regional cities have problems with the development of design because most design consultancies are located in or around the capital city, which in turn creates communication difficulties. Although there are a number of DICs to help SMEs across the whole country, a few companies know of their existence. Many respondents are, furthermore, interested in collaboration with industry and universities but they perceive it as *obtaining the knowledge related to design from academia* but *the quality of outcome* is not good. The main suggestions from the respondents for design industry are:

- More information on the national/international design trends, design consultancies, and diagnosis of design and design strategy for companies.
- The value of the 'Good Design' programme should be raised and globalised.
- The support programmes should be developed more practically and the application process, report and maintenance should be easier and simpler.

Recommendations for the support programmes

As a result of the analysis of Korean government policy, the work of KIDP and an analysis of the result of the questionnaire survey, there are seven recommendations that can be made:

(1) Improving PR in relation to the national design policy and design support programme by the government: SMEs do not know the national design policy and design support programmes by KIDP very well, and the way they usually find out more about the design policy and related support programmes are through suggestions by design consultancies rather than a PR by KIDP. The current opportunity to participate in the support programmes is therefore not evenly distributed.

(2) Developing different support programmes for MEs and SEs: Most SMEs had mainly participated in funding support programmes, in particular *Design Innovation Programme*. The responses of the survey such as satisfaction/dissatisfaction of the support programmes, which they had joined, are somewhat different depending on firm size and locations. The most important criterion and the biggest challenges for the investment in design are identifying what programmes should be improved and supported, as well as what programmes companies have joined and would join in the future, etc. The results indicate that the requirements of companies and effectiveness of support basically differ according to firm size. More research is required to target the programmes most appropriate to the right type and size of firm.

(3) Developing the support programmes more practically: Most respondents who participated in funding support programmes are satisfied with the amount of funding and the application process and method. Just around 40% to 50% of respondents, however, are dissatisfied with the result of the development of design, the actual duration of the process,

the process of the development of design and the design consultancies. The reasons for dissatisfaction are (1) poorly qualified design consultancies, (2) fixed duration of design development and (3) a perfunctory and non-professionally organised process. Therefore, designers need more training on how to develop design quality and professional skills and how to operate within a programme.

(4) Improving the quality of design consultancies and subdividing into specific field of design consultancies: The main reasons why most SMEs do not have in-house designers are a heavy load of personnel expenses and not many tasks for the development of design. Companies should work with design consultancies; however, only around 60% of respondents are satisfied working with such consultancies. A lack of knowledge of the products, i.e. a lack of speciality, is the main reason for dissatisfaction of design consultancies. Increasing the level of specific knowledge and expertise within design consultancies are identified as necessary.

(5) Providing practical education and training programmes for designers and CEOs: The respondents believe that the design policy in most need of improving is education and training programmes within the programme to support companies. They perceived that design education in university is not good enough for practical work in industry and education in universities should be adjusted based on the demands of the industry. To increase the awareness of design, regular training programmes and seminars for CEOs are needed. SMEs cannot retrain their designers due to a lack of budget and human resources, therefore free training would be a value to both SMEs and CEOs.

(6) Re-considering the main operator in support programmes: The funding support programmes use the design consultancies as main operators and general companies as participants. Although there are some advantages and disadvantages with the system, over 50% of respondents argued that SMEs should be the main operators of the programme because the companies participating are supposed to be the real beneficiary of the programmes and they should be able to choose appropriate design consultancies for their development of design. Although 32% opted to return the current system, it is appropriate to reconsider the funding approach.

(7) Raising the value of the 'Good Design' award and its globalising: The effects of the award 'Good Design' is mainly considered as an improvement of corporate images and an increase in brand value. 50% of respondents in MEs mentioned, however, there was no effect of the award because consumers in global markets did not contemplate the award when they purchased products and the award of Good Design was biased towards products of specific areas and firms. It is therefore important to raise general awareness amongst consumers for this award to have an improved effect, or at least to test the effect.

Conclusion

Design plays an important role in the competitiveness of countries and their economies, and developing economies are increasingly recognising the use of good design as an invaluable strategic tool to improve their economy and quality of life. This transition requires investments in different elements of the business environment, the upgrading of company strategies and the creation and strengthening of new types of institutions (DTI 2003e; DTI 2003g). As mentioned previously, the general aim of design policy is to increase the organisational benefits and national and international competitiveness of the business sector. Developing an appropriate government design policy to support firms' ability to use and foster creativity and design is crucial.

In this paper, the national design policy and related support programmes for SMEs in South Korea has been studied. This paper can act as a case study by which to benchmark how other countries develop and implement their design policies and related support programmes. This paper consisted of three parts as follows. Firstly, the development of design policy in South Korea was briefly described. Secondly, company satisfaction of the support programme has been surveyed and analysed. Finally, recommendations for support programmes in the national design policy, have been identified as follows: (1) Improving an activity of the PR about the national design policy and related design support programmes, (2) Developing different support programmes for MEs and SEs, (3) Developing the support programmes more practically, (4) Improving quality of design consultancies and subdividing

into specific fields of design consultancies, (5) Providing practical education and training programmes for designers and the CEO, (6) Re-considering the main operator in support programmes and (7) Raising the value of the 'Good Design' award and its globalisation.

This study is part of ongoing research to benchmark national approaches to the support of design. The results are currently being validated further with KIDP, SMEs and design consultancies respectively.

Acknowledgement

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RE-ASSESSING ASSESSMENT PRACTICES IN DESIGN TO SUPPORT STUDENTS' LONG-TERM LEARNING

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Abstract

Traditional design assessment practices are problematic as they typically occur at the end of a course and often rely on the marking of an artefact as a measurement of a student's achievement in that course. This limits the possibility for the student's transferral of learning to a future context such as the workplace, as learning is often restricted to that which is required to pass the course. Recent online discussions of design research also suggest that traditional assessment practices may not be a reliable indicator of student achievement in certain desired, less tangible aspects of design, such as scholarly enquiry, critical thinking and self-reflection and articulation of iterative creative rationales that support decision-making.

I aim to create a space for rethinking current assessment practices in higher education in design and will provide evidence for how the application of the principles of sustainable assessment could better support students' long-term learning in design. I will reflect on my recent experience in using the framework of sustainable assessment to develop teaching and learning strategies and tools for a unit of study in graphic design and present my observations of changed student attitudes to learning. The results suggest that students become more critically self-reflective in individual and peer learning contexts, more effective in articulating and achieving professional standards and demonstrate discernible differences in attitude toward design learning that has transferred to other subjects and their workplaces. This indicates that students develop more autonomy in their ability to draw on a range of sources, strategies and tools that assist them in monitoring their continued learning in design.

Introduction: Current assessment practices in higher education in design.

Assessment practices in higher education in design are problematic as teachers seem caught between evaluating student performance in becoming industry-ready graduates, and the realities of having to award and defend grades within the technologies of governance of a university system that demands transparency, equity and defensibility in assessment procedures. From a teacher's perspective, the act of assessment in design education is highly subjective, emotionally fraught, difficult and tedious. In the current teaching climate of large class sizes and shorter contact hours, teachers often struggle with the conflicting demands of process-based formative feedback while awarding grades against outcome-based performance indicators. At the same time, the process of measuring students' achievement in a specific unit of study seems both unconnected to student learning about design and is not readily transferable to other areas of learning outside the unit of study, such as the workplace.

Assessment practices commonly attempt to simulate evaluation methods in design practice and are designed so the teacher can judge the student's success in meeting a brief that outlines project objectives and production specifications, and is measured against professional standards. Students are required to work through sets of predefined performance indicators, via a process of research, creative experimentation and concept development. This process culminates in the production of an artefact that is presented to the teacher who, relying on their knowledge of professional design standards and experience in assessment, judges the outcome and awards a grade, which the student receives some time later, with or without feedback.

It is commonplace practice in higher education in art and design to award a grade for a student's performance in a subject at the end of the subject. This is often problematic for the student, who may not be aware of their progress until they receive their grade, while it is problematic for the teacher, who is required to assign a grade to an artefact that often appears at the end of a process, while attempting to rate the student's progress in this process against a range of performance indicators. The process is highly subjective and time consuming, yet the pursuit of high grades at the expense of learning often becomes the focus of the student's efforts, while the efforts of the teacher are focused on providing feedback for learning during design development while balancing the university's certification requirements.

In addition, the 'effects of assessment' (Boud, forthcoming), on learning as students experience assessment as something that is 'done to them' at the end of a project rather than something they 'do for themselves' as they learn, are such that the value of feedback is often negated when students receive grades that are at odds with their perception of their progress. At the same time, the grades achieved greatly impact on how students view their aptitude for the subject area generally.

Discussions about design evaluation reveal tensions between the conflicting needs and processes of assessment in design education and professional practice. Yet what seems to be missing in these discussions is a focus on how assessment could positively affect students' learning in higher education in design and how this could position them for learning in their future workplaces.

This paper draws on the framework of sustainable assessment to foster long-term learning (Boud & Falchikov forthcoming), which shifts the focus of assessment from measurement to 'informing judgement'. This focus serves two functions – one is to inform students how to judge what they learn, why they learn it and how they learn it, and the other is the act of forming judgement on their learning to assist long-term learning in design beyond the institution.

I will argue that sustainable assessment practices may enhance the long term learning of design students by offering teachers alternative approaches to constructing assessment tasks that go beyond the traditional functions of measuring achievement for certification in courses and providing feedback for immediate learning in projects. By applying this framework for the purpose of 'informing judgement' in design education, I will provide evidence from my own experience that supports the idea that teachers can assist design students to internalise acts of self-evaluation of their work in a more authentic judgement of learning. I will argue that an enhanced capacity to sustain self-assessment of their learning beyond the institution will be useful to students as they prepare to enter professional design environments.

Theoretical framework: Sustainable assessment that fosters long-term learning.

Boud has defined sustainable assessment as 'assessment that meets the needs of the present without compromising the ability of students to meet their own future learning needs' (2000, p. 151). He claims that in higher education, the act of assessment has traditionally been required to do 'double duty' (p. 151), in meeting institutional certifying goals and facilitating students' learning. This means that assessment practices have focused on certifying student achievement in courses (summative assessment), and aiding learning in the classroom (formative assessment). Boud argues that while each has a different purpose, the dominant discourse in higher education gives prominence to grading and certification and represents a 'self-consistent world of assessment' (Boud & Falchikov forthcoming) that obscures the potential for assessment to foster learning beyond its boundaries.

Boud and Falchikov (forthcoming) have three main criticisms of this discourse. First, that the technologies of governance in the university support an agenda of authority which constructs the student as a passive learner subjected to acts of measurement and classification that conform to its rules. The authors claims that this is at odds with an educational view of assessment that constructs the student as an active learner, arguing that if higher education is meant to prepare students for learning as professionals, then students need to construct themselves as active learners who are dynamically engaged in what they learn, how they learn it and how it is judged.

Second, the practice of giving and receiving feedback, according to Sadler's (1989), notion of the 'feedback loop', requires the

student to self-initiate a confirmation of their learning in response to the feedback with which they engage. If the discourse claims that feedback is the 'only process that influences learning' (p. 29), then teaching practices that either construct students as passive recipients of feedback or provide it only at the end of a unit of study, weaken its capacity to inform learning.

Thirdly, assessment needs to focus on the importance of learning, rather than on the achievement of high grades. The authors suggest that as there is little research on the positive 'effects of assessment practices' (p. 30), and only anecdotal evidence of its negative impact on learning, a new way of thinking about assessment that could have a 'positive consequential influence on learning' (p. 30) could assist in developing appropriate assessment practices that accompany this conceptualization.

As a way of addressing this, Boud and Falchikov propose a counter-discourse in assessment that challenges the institutional construction of assessment so that its effects, while *impacting* on learning, may also *involve* learning, which, they claim, has been diminished by the focus on grading and classification. Citing Edwards (1997), Boud argues that in the current uncertain climate of self and social questioning, there is an urgent need for the learner to develop more than just a capacity to successfully learn to adapt to change, but to also enlarge the scope and generate change for themselves as lifelong learners in a learning society. (2000, p. 153). Boud (2006) argues that higher education has a role to play in contributing to this capacity by equipping students with the ability to assess their own learning.

Boud proposes sustainable assessment as a way to build on summative and formative assessment as a 'framework for thinking about the development of judgement and the idea of assessment being the process of informing judgement' (forthcoming). Making informed judgement about learning means being able to seek and receive feedback from a range of sources, identify and evaluate achievement against a set of professional standards and criteria and to articulate and undertake further learning more effectively.

In the current assessment discourse, despite the commonly held view that it is essential to the pedagogic process, formative assessment appears to be losing ground (Biggs 1998; Hounsell 2003), despite the literature supporting its practice (Orsmond, Merry & Reiling 2002; Winter 2003; Gibbs & Simpson 2004; McFarlane-Dick & Nichol 2005). In their extensive review of the assessment literature, Black & Wiliam (1998) suggest this is due to generally poor quality practices. This view is supported on the one hand, by research (Serafini 2001; Hussey & Smith 2003) that argues that in order for formative assessment to improve, a fundamental change in teaching and learning philosophies and practices in higher education needs to occur. On the other hand, Boud (2006) argues that as it lacks an orientation toward developing student capacity for future learning beyond the institution, improving formative assessment is not enough, and that assessment needs to become embedded in learning so students may develop and sustain their capacity to assess their own learning throughout life.

As sustainable assessment foregrounds concerns about learning, it prioritises the act of being informed about the process of judgement while it recontextualises as secondary, acts of measurement, standards and integrity. Supported by Black and Wiliam (1998), Boud argues that self-evaluation, or the act of learning to make judgements about one's own and others' work and making decisions constitutes the most important professional learning in the workplace, and that aligning assessment with learning for the long-term will contribute to student's capacity to self-evaluate.

Finally, the authors argue that while there is much to be gained from the development of an agenda of reform, teachers still face difficulties in balancing the conflicting aims and strategies of summative and formative assessment. I will argue that this is particularly evident in the context of design education.

Key concepts

In order to discuss how sustainable assessment has impacted on my teaching and learning strategies in design education, I will first outline my pedagogic philosophy to identify assumptions that underpin my interpretation of the effects of this process on students' learning. In contrast to a positivist paradigm of teaching that believes that knowledge is a commodity that is transferred from teacher to student, that meaning resides in the text and there is only one true

interpretation acceptable in assessment, I subscribe to what Serafini (2001) describes as a constructivist perspective of learning. This has at its core the belief that 'knowledge is socially and cognitively constructed' (p. 385) by students as they interact with their learning environment. Serafini explains that these paradigms approach assessment differently in relation to levels of student teacher involvement, methods used to select and collect data, purpose and intended audience. He argues that a positivist paradigm views assessment as a way to measure student performance with objective tools such as tests, that require minimal teacher-student interaction for the purposes of selection for employment or further study. This seems an incongruent way of assessing student performance in design education due to its highly creative and subjective content and processes that do not lend themselves easily to objective measurement.

Biggs' (1996a) has suggested that the constructive alignment of course objectives, learning outcomes and assessment criteria is necessary to enhance learning in higher education. This idea has had a big impact on the construction of design curricula in higher education and has subsequently impacted on the design and implementation of teaching and learning strategies. While careful consideration is given to ensuring that desirable learning outcomes match both the course objectives and explicit criteria against which these will be evaluated, in practice I have found that the less tangible aspects of design processes, such as critical self-reflection and analysis, are not easily measured in an act of assessment that occurs during the presentation of an artefact at the end of a course. This may be due to the difficulty students have in producing tangible evidence of having developed proficiency in desirable generic attributes (Hager, Holland & Beckett 2002) other than in the production of technically proficient outcomes, or it may be that as teachers, we do not have the strategies to adequately balance the conflicting demands of summative and formative assessment.

It appears that while the current climate of assessment in higher education in design demands transparency, equity and accountability, this seems to restrict possibilities for short and long-term learning. Hussey and Smith (2003) argue that strict adherence to aligning learning outcomes with course objectives can constrain the teacher from exploring possibilities for enhanced learning, which they term 'emergent learning outcomes' that are not explicitly described in the course curriculum, but arise from related discussions or activities. This tends to restrict teachers to using strategies that explicitly address curriculum content while limiting student learning to what Race (1999) terms 'surface learning', that which is required only for passing assessment.

This is contrary to the transformative teaching and learning practices inherent in a pedagogic philosophy that aims to challenge students' understanding of the nature of learning. This philosophy is invested in disrupting students' meaning-making assumptions by prompting their critical reflection on 'significant personal learning' (Brookfield 1987a, p. 65), or 'disorienting dilemmas' (Mezirow 1983, p. 126) that have the potential to transform students' views of the 'space' they occupy as designers in society, into a 'place' of value and respect (Grace 1997).

Assessment strategies in such a pedagogic framework are more closely aligned with student-centred learning and require a greater level of student teacher involvement, employ qualitative data collection methods, have an audience beyond the institution and a purpose of informing judgement on learning in the short and long-term. This means that learning becomes a 'social, contextually specific, interpretive activity' (Serafini p. 387) in which students construct themselves as assessors of their own learning. In doing this, they draw on their learning environment, their peers and others to inform their capacity 'to evaluate evidence, appraise situations and circumstances astutely, to draw sound conclusions and to act in accordance with this analysis' (Boud & Falchikov forthcoming, p. 30).

Boud and Falchikov argue that assessment in which learning is embedded becomes more sustainable and that this requires changes in teaching practices. These changes need to encompass the following –a contextualised standards- based framework against which students can view their own work; a belief that all students can succeed; the encouragement of students' confidence as learners; the separation of grading from feedback; a focus on assessment for learning, not performance; the development of students' self-assessment abilities; the encouragement of reflective peer assessment; and feedback on assessment tasks that influences further learning (2006, p. 408).

While a totally integrated alignment of learning with assessment such as that discussed by Mentkowski (2000), is an ideal way to align assessment with long-term learning, it would be unrealistic for me to suggest that the practical examples offered in this paper provide a way forward for all design education. This is partly due to design's disparate positioning in various disciplines and the contemporary difficulties facing design educators in relation to class sizes and limited time and staff. However, I would also argue that the framework of sustainable assessment provides a guide for a radical reassessment of assessment practices in higher education in design. I see it as a way to shift the focus of assessment from one of measurement for certification, as the responsibility of the teacher, to one of informing judgement about learning, as the responsibility of the student. This helps students to construct themselves as active participants in the process of learning to make judgements now and in the future.

Assessment practices aimed at informing student judgement on learning: Practical examples from a graphic design course.

Course context and structure

In this paper I argue for the need to create a space for different ways of thinking about problems in assessment in higher education in design. To support this argument, I will draw on my recent experiences and reflect on the application of the framework of sustainable assessment to my teaching and learning practices. Evidence of the positive effects of assessment on students' attitudes to learning is based on my experience teaching a graphic design course to different groups of students over four semesters.

I was introduced to the concept of sustainable assessment as a student in a research in progress subject with David Boud in 2005. While participating, I began to apply the principles of sustainable assessment to my teaching and learning practices in a course I had been teaching for seven years. The practical examples described in this paper draw on existing design education assessment practices incorporating summative and formative assessment that were progressively amended over two years.

Two ways in which these examples differ from traditional practices are – first, I tried to embed assessment in every stage and activity of the course through a range of teaching and learning strategies; and second, that I provided opportunities for students to revise each task at any stage of the course, after engaging in feedback from myself and peers and prior to submission for grading. Overall, students had the opportunity to reflect on and evaluate their learning in a range of ways, which essentially shifted the focus of assessment away from the external authority of the teacher within the context of the classroom, to internalised self-evaluation by the students beyond the context of immediate learning in the classroom and into future learning in professional practice.

The course is an introduction to Graphic Design that is discrete from articulated design programs and is an undergraduate elective subject run over 12 weeks and available to students enrolled in a range of degrees within an architectural faculty at a university in Sydney. Tutorial sessions run for three hours and comprise a group of about 20 students who are typical of those enrolled in professional degrees in Australia and represent a diverse range of cultural backgrounds and work proficiencies, with different expectations, needs and experiences of learning in secondary and higher education in Australia and/or internationally. I applied this framework simultaneously to a similar course for postgraduate students and my observations of the results were integrated in the reflection. This means that the data I have used for reflective analysis has been derived from my observations over four semesters during 2005--2006, teaching eight courses to around 160 students.

I have had a high degree of autonomy in curriculum development in this unit of study, so it represented an ideal context in which to apply the principles of sustainable assessment to my teaching and learning practices. The practical examples included in this paper describe the strategies and tools I developed, and the reflection incorporates my analysis of their effectiveness in fostering student long-term learning in design.

Teaching and learning strategies

The assessment design draws on Boud and Falchikov's recommendations for teaching and learning activities

that 'emphasise preparation for learning that is socially constructed, participative, embedded and necessarily contextualised' (2006, p. 408). Briefly, these involve student engagement in the selection of standards and criteria and problem analysis; emphasis on context; working with others; authentic representations and productions from professional practice; transparency of knowledge in learning; fostering reflexivity; constructing active learners; fostering confidence in judgement; promoting seeking and receiving feedback; and investigating the production of learning outcomes for different purposes (2006, p. 408).

Some of the conditions for this kind of teaching include the establishment of a safe learning environment where the teacher acts as a facilitator of student-centred learning, is conscious of the power of their own and other dominant voices in the classroom (8yrne-Armstrong, Jorsfall & Pinn 1998), and is adept at managing group dynamics within classrooms (Jacques 1994).

8roadly, the course structure is organised around seven discrete tasks introducing design elements and principles over consecutive weeks that are designed to build student's knowledge in design, a group presentation on design history and a project which provides an opportunity for students to apply their accumulated learning.

Strategies and materials used during the course include:

- **Teaching and learning strategies:** lectures (informal slide discussion and formal Powerpoint presentations); demonstrations; examples; experiential learning; experimental hands-on classroom activities; group presentation; information retrieval and analysis; observation; homework; revision (feedback loop); discussion; and various feedback and reflection strategies (verbal: teacher, self, small group, large group; written: self, peer, teacher; electronic: email).

- **Printed support materials:** weekly handouts detailing activities, homework, assessment criteria, grading and weighting, references for additional information; readers containing relevant articles; and lecture notes.

Assessment activities

This section describes the assessment activities and includes discussions of their application. The activities represent a mixture of traditional (graded artefact design and presentation) and alternative assessment tools (peer, self, group) that employ various learning strategies in which assessment is embedded. These include reflective practice (reflection-in-action, reflection on action, reflection before action); observation; experiential learning and experimental visual research; peer learning; learning in groups; learning from others; learning from lectures; secondary information sources; and others. Following this description, I include an explanation of how the activities are aligned with assessment tools that are used for the purposes of formative, summative and sustainable assessment (see Appendix one for detailed description and assessment criteria and weightings).

The teaching strategy embeds assessment in several stages of activity and reflection and roughly follows this sequence – individual classwork and review, then group review of classwork outcomes; individual research, observation, reflection, then application to homework at home; group review of homework the following week; and finally, reflection, revision and inclusion in portfolio. As the teaching and learning strategies are student-centred and structured for high flexibility, I am able to respond to class mood at different times in the course by providing substitute activities or replacing these with informal discussions about issues or aspects of learning with which they are involved. Discussion topics include how students' learning in other courses is progressing, how their attitudes or knowledge about design have changed, issues or problems they are having with tasks, questions about assessment and grading, what they would still like to learn, what has changed since they started and so on.

When they occur, these discussions are highly stimulating and serve several purposes – to 'air the room' if there are unresolved issues in relation to student expectations; to address contemporary design issues that are indirectly related to course content; and to inform my judgement on students' learning to date, group dynamics and the identification of other learning needs students may have. These discussions may result in elements of the curriculum being omitted, but as

I grade the accumulated body of work in the portfolio rather than individual exercises, I have found that this does not affect grading levels or procedures. However, I still expect that self-reflection would occur on these occasions and be represented in students' learning journals in some way. This is the same when students are absent and my observation is that when this happens, they often self-initiate research into the missed week's topic and some even construct their own exercises to demonstrate what they have learned outside the context of the classroom.

Essentially, I grade a portfolio that students collate as evidence of their informal learning resulting from self-reflection, and formal learning resulting from class exercises and designed outcomes. The two features that differentiate these tasks from traditional methods is that formative assessment occurs regularly and in a variety of ways that involves students; and the opportunity students have to revise their work after receiving feedback and prior to summative assessment in week 9 and week 13.

The following section describes my attempts to embed assessment in various forms at every stage of the course. In each case, students are involved in setting the standards and criteria for assessment as part of the process of becoming informed about judging their work and their peers' work (see Appendix one for more details).

Week 1. The first activity in which the group engages is an ice-breaker that also serves as an act of assessment. Students choose from a selection of postcards the one that most represents what they think graphic design is about, then describe their rationale to another student. The other student presents their peer's rationale to the group, while the teacher lists, but does not evaluate, the group's observations on a whiteboard. The emphasis of the exercise is on student analysis of examples of contemporary graphic design, while it serves other purposes – to introduce students to each other in establishing the social and participatory nature of a student-centred learning environment; to foster their confidence in their ability to articulate their observations to a group of strangers; and as a way to position myself as a facilitator of learning. The effect is that the teacher scaffolds students' construction of a more complex understanding about the subject content and structure and the learning environment in which they will participate, while students benefit from listening to twenty others articulate their design rationales, as they draw comparisons with their own.

Weekly class exercise format, weeks 1–6 and weeks 7–8. Students are required to follow prescriptive rules within a seemingly random process using hand-generated techniques, materials and a photocopier. The idea is that students learn from doing and watching others do, creative activities without knowing where they will lead. The emphasis is on decision-making based on observation, rather than working from preconceptions of what the outcome should look like.

There are four stages in each exercise. Stage one is highly energetic and fun (for example, exercise 2: involves quickly generating nine 50x50mm squares of diverse textures by photocopying different compositions created with different media). Stage two involves the student's individual analysis of their stage one outcome as they identify specific visual attributes (exercise 2: involves finding a visual link between two textures, composing them in a way that enhances the observed connection and articulating it in writing without revealing this to the group).

At this point, students view their peers' outcomes of stage one and two to see the range of possibilities the exercise has afforded the group despite the process restriction. Following the principles of good feedback practice (McFarlane-Dick & Nichol 2005), the group provides peer feedback on their observations of the visual connections individually identified in stage two. This feedback is used as the basis for the individual student's reflection on how their observations vary from, or are consistent with, those of the group. The purpose is for students to experience and reflect on the multiple socially constructed ways of seeing and interpreting visual cues.

Stage three is conducted at home as a process of self-reflection, observation and analysis of collected contemporary design examples that address the weekly theme (exercise 2: find and analyse contemporary applications of texture in design, reflect on what you observe and learn. Utilising the textural qualities you identified in stage two as the conceptual basis for communication, design a postcard that uses text to enhance your intended meaning). Stage four involves peer feedback

on the effectiveness of the outcomes in a group review the following week.

All experiments, alternative approaches, reflection, observation and additional research for each of these exercises are included in the student's portfolio and the outcomes may be adjusted at any time prior to submission for grading.

Group presentation week 5. The activity involves self-selected peer groups in the research, analysis, selection and presentation of information to the class about a period of design from a specific time and cultural context. The purpose is to engage students in a team activity utilising design research processes and incorporating acts of assessment about relevant information and how to present it. Though the students are graded as a group, individual contributions and research are recorded in students' learning journals.

Project weeks 9–12. A project in which students apply their accumulated learning in a specific graphic design context – the promotion of a social issue to a specific community in a large-scale graphic format such as poster or billboard. This project follows the principles and practices established in the previous exercises, with the inclusion of a peer-assessment tool (see Appendix one for weighting). Provision is made for students to revise their submission after presentation and feedback in week 12, and prior to submission for grading in week 13 or 14 as a way of providing evidence of their response to, and completion of, the feedback loop (Sadler 1989).

Assessment tools

Alternative assessment (sustainable: informing judgement on learning) – the portfolio. This is a tool which builds on the idea of setting authentic assessment tasks that test 'our intellectual ability, or ability to understand' (Maclellan 2004a, p. 20), by focusing on students' analytical skills and their ability to integrate new learning, while weighting processes and outcomes equitably (Snavely & Wright 2003, p. 300). The use of portfolios as evidence of learning is common to various educational disciplines, particularly teacher education, (Brown 1997; Snavely & Wright 2003; Winter 2003), as it is argued that they allow the student a range of possibilities for providing evidence of their learning that draws on various learning strategies. If done poorly however, it may simply represent a collection of examples of student performance that, if used for summative assessment purposes, may compromise the validity of the assessment (Maclellan 2004b).

The portfolio evidence includes: a progressively written learning journal (critical self-reflective practice: reflection-in-action, reflection-on-action); class exercises (experiential learning); analysis of collected contemporary design examples and additional reading (observation, visual research, data retrieval, selection and analysis, and reflection-before-action); application of learning to a contextualised designed outcome (analysis and integration of learning strategies); revision of exercises (feedback loop); group presentation (contribution to team work and team learning); and a simulated design project (analysis and integration of learned design principles in design process and design knowledge – information retrieval, visual research and iterative design development, creative concept generation and development, synthesis of objectives in the composition of graphic elements, success of communication intention, technical proficiency, professional presentation). See Appendix one for more details.

The use of self-reflection as a tool for informing and sustaining students' judgement on their learning has been covered in the adult education literature (Schon 1995; Boud & Knights 1996; Boud & Walker 1998), as has the use of learning journals to promote and foster self-reflection (Boud 2001). As the emphasis is on the sustainable aspects of assessment that self-reflection promotes, the act of awarding grades to these activities seems at odds with this purpose. I have observed that students are more inclined to engage in reflective practice when it accounts for part of their subject grade, so I evaluate the learning journal in conjunction with the class activities, balancing what the student identifies as appropriate learning with what I observe has changed in their activities over the nine week period. Together, they constitute 30% of a student's overall grade for the course, but their purpose is to assist students in evaluating their own learning in a variety of ways, primarily through self-reflection in the learning journals and observation of their learning achievements in the act of compiling the portfolio, with the opportunity it provides for revision prior to submission for grading. The use of learning journals based on the fine arts model of recording creative development is not

new in design educational practice, yet I have found that often students use them as cursory descriptions of their activities rather than as evidence of critical self-reflection on learning, and teachers use them literally as a way of measuring quantity in documentation rather than quality of learning.

Alternative assessment (Sustainable: Informing judgement on learning) – negotiated learning contracts. This is a student-centred, student-driven learning and assessment tool commonly used in teacher education and based on the principle that students determine their own learning objectives, the strategies to achieve these, the outcomes and assessment tools and weightings (see sample in Appendix three). I have not used learning contracts in this course, but have used them in a supervisory context with two postgraduate students to great success. My observation was that while their levels of engagement in the learning process were higher and this impacted positively on the technical proficiency of their outcomes, their initial levels of anxiety about the assessment process itself were also high, as they were concerned about being 'cut adrift' from their usual experiences in teacher-driven assessment strategies. Interestingly, I asked each student to award grades against their self-determined assessment criteria and to support this with a rationale. I then graded their work without seeing what they had awarded themselves, and in both cases, the marks varied by only 2% and were within the same grading bands.

Each student expressed satisfaction with this learning and assessment process and felt that, despite their initial anxiety, they were better placed to determine and evaluate their learning needs in the future. This suggests that the 'double duty' (Boud 2000) that assessment is expected to perform may be achieved using alternative assessment tools and strategies without de-emphasising student learning for the future. I hope to adapt this tool for undergraduate studies.

Formative assessment. This is embedded in every stage of the course as described previously, and incorporates a range of strategies, including peer, group, tutor and self-assessment. The provision of feedback follows the principles and guidelines from the extensive literature (Boud 1991; Boud 1995; Anderson & Boud 1996; Falchikov 1996; Boud 1999; Falchikov 2001; Gibbs & Simpson 2004; Falchikov 2005; McFarlane-Dick & Nichol 2005).

Summative assessment. Grading is required by the university several weeks after the end of the course and I conduct this in two stages – in week 9 before the introduction of the project and a week after presentation in week 12. Detailed verbal feedback is provided to students in the form of individual consultations the week following submission. In this process, I take up a questioning position in relation to the student, enquiring as to how they think their learning has progressed over the period of time and in relation to the evidence provided in their portfolios. This is primarily to allow them to evaluate their learning after a week's reflection before I respond and helps me see whether my observations correlate with theirs. I acknowledge that asking students to reflect at this stage is idealistic on my part as I find that in practice, many students have moved on to other subjects, so spend little time reflecting on learning between submission and receiving their grades.

Combining assessment functions. In second semester 2006, after grading in week 13, I emailed each student a word document with a table of their graded tasks and detailed formative feedback (see Appendix two). As suggested previously, the provision of grades and written feedback in the same document does not adhere to the principles of sustainable assessment and I would like to address this as I continue to develop the practice further.

Key observations on the successful application of sustainable assessment practices in design education.

In summary, my observation of applying the framework of sustainable assessment to my teaching and learning assessment practices in design include the following positive effects of assessment on student learning:

- More engaged student cohorts that were more proficient in giving and receiving self, peer and tutor feedback that supported their own learning and that of peers;

- Students exhibited a greater capacity for critical self-reflection through the use of various strategies and tools;

- Students were more involved in the identification, selection and evaluation of professional design standards and criteria and were better able to judge their own work and that of their

peers against these, reflecting greater alignment with teacher evaluation of their work;

• Increased self-instigated student revision of various assessment tasks sometimes beyond that required for grading;

• Deeper levels of student enquiry across entire cohorts, evidenced through various strategies and self-sought resources outside the class environment;

• Standards of student artefact production were strengthened overall, reflected in consistently higher student marks across grading bands;

• A more demanding classroom dynamic where students interacted, questioned and challenged the teacher, themselves and their peers in relation to claims to truth, ways of seeing and being, and the nature of socially constructed interpretations of design in contemporary practice;

• Increased student satisfaction with the teaching and learning strategies they experienced in the course, often articulated as accounts of what they had learned during the course and how this would be applied to other subjects or the workplace;

• Reduction of student challenges of grades to nil, reflecting a more transparent grading process that was equitable, accountable and defensible; and

• Students engaged in more explicit feedback on their increased knowledge of design and the effectiveness of my curriculum design and teaching and learning strategies, reflecting improvement in the professional development of my teaching practice.

These observations support the idea that aligning assessment practices with learning is effective in fostering students' short and long-term learning, even though it requires changes to teaching and learning strategies. I acknowledge that this is more easily achieved in the autonomous and discrete educational context I have described, however I see that there is potential to improve our assessment practices to foster every student's capacity for reflection on learning that is self-instigated, ongoing and independent of external authorities.

Summary

My observation of aligning assessment with long-term learning suggests that students experience positive effects of assessment that include changed attitudes towards learning and the development of skills to inform judgement. This was evidenced in a number of ways, including increased engagement in experiential learning activities, participation in giving and receiving feedback, improved capacity for self-reflection and greater conceptual and technical proficiency in artefact production, particularly for those students who were seen to be weaker in aptitude, critical thinking or technical skills. This supports the idea that designing assessment activities to inform judgement could result in an improved capacity in students' abilities to make appropriate judgements about their work and that of others and that this could be sustained beyond the educational context and into a professional environment. As designers in the context of an uncertain future, this positions students well for managing long-term learning in the workplace.

Appendix one. Assessment tasks – categories and weighting.

Process journal individual folder (12 hours), 15% of final mark. Your process journal should indicate that you are thinking, visualising and demonstrating critical processes. Your journal will reflect the sequence of the six studio exercises and will contain a range of printed contemporary examples that match each exercise – brochures, magazine and newspaper ads, postcards, posters as well as notes on ideas and designers. You will include your research and documentation of designers and design issues relevant to the studio discussions and include a bibliography on texts concerned with graphic design, typography or digital technologies or other current design issues. You will include a brief description of each book or article in your own words about the main ideas discussed.

To be discussed more fully in class and will document the following as you progress in the course:

Collected contemporary printed design examples. These will be relevant to each of the six weekly studio exercises, collected from your environment (not from the internet or

books). They will vary in size and context and may range from postcards to advertisements to your own photographs of large-scale graphics or signage. You will look for contemporary professional graphic examples that extend what you have learned in each weekly exercise, commenting in your own words on what you notice about the designer's use of an element of design and their reason for selecting it.

Additional information. This includes week by week relevant information selected from accredited sources such as design journals or the reading list. Evidence of this may be in the form of annotated bibliographies, written in your own words and summarising and critiquing the key ideas discussed. The range of topics will include those discussed in the studio, and may be extended to your specific area of interest.

Visual research. This means week by week experimentation in the application and extension of the studio exercises, including roughs and processing of your original images, typographic manipulation and layouts. This will be original work and should not be based on work that you have found or amended. Please note the University's policy on Academic honesty and plagiarism.

Personal reflection on learning. This will record what you have learned as you progress through the course. It may be highly personal and may express the emotional impact of learning, or simply document factual information that is newly acquired or amended. Please note that this information is treated confidentially.

Bibliography. This is a list of articles, journals and books you may have used to find additional information about the design elements and principles discussed in class and will be recorded according to the University's recommended referencing system. This may be optional if you are including annotated bibliographies of articles and books sourced from the library. Information sourced from the internet may be useful for practical information, but books tend to allow you to find a broader range of information – and may allow you to accidentally discover something exciting.

Notes and research for group/individual presentations. This includes the information you have found during the group presentation and typographic research exercise. It may comprise articles you have sourced, notes on the presentation and images used as examples. It will reflect the individual contribution you have made to the group presentation.

Assessment criteria for the journal. The journal will be written in your own words and will include your personal sketches and ideas as well as citations from accredited sources. You may choose the size and format, but allow space for pasting examples and writing notes. The journal may be in colour or in black and white, as necessary. You will be reflecting on what you are learning as you learn, so the notes will indicate new knowledge as well as adjustments in your existing knowledge and how this may impact on your own area of study. You will be marked according to the level of enquiry you make into the design elements and principles raised in each weekly exercise. This means how you are exploring the new information gained from participating in the exercises and discussions, and how this affects how you may approach design differently. This may include any insights or understanding of new ideas, or simply build on what you already do.

The journal will include evidence of your first hand observations of contemporary design outside the studio environment (through the collected examples), additional information found in secondary sources (expressed as brief annotated bibliographies), innovation and experimentation in design processing (demonstrated through your roughs and sketches), critical reflection on the practice and theory of design (written in your own words, and making links between your experience in the exercises, your observation in the design environment and any additional information you have read).

Weekly exercises. Applied six studio exercises conducted in studio time and completed at home (6 hours), 15% of final mark. This includes evidence of participation in each of the following six weekly exercises: 1 shape, 2 texture, 3 tone + colour, 4 layout + composition, 5 typographic poem and 6 type + image.

Assessment criteria for exercises. The level of achievement in the exercises will reflect the level of enquiry and processing demonstrated in your process journal and in your participation in the class experience. A good pass mark will include the

successful completion of all components specified in each weekly outline. Your experimentation while extending each exercise in the homework may be affected by personal insights based on observation and additional information. Innovation and original thought in ideas and processing the final submission will attract a higher grade.

Group presentation (4 hours each student, 15 minute group presentation), 10% of final mark. Includes: research and presentation of information about graphic design in a specified period of time and cultural location. This is a group grade and is marked in studio during presentation, however, you will document your individual contribution and research notes in your learning journal.

Type research + presentation as exercise 7 (2 hrs), 10% of final mark. Includes: research about two typefaces used in ex 6, applied and presented as a magazine layout in ex 7.

Major project (12 hrs), 40% of final mark. Includes:

- poster research and presentation (peer assessment, 10% of project mark)
- conceptual development of a self-selected research topic in consultation with tutor
- identification and prioritisation of steps in the communication process
- original visual research documentation and processing and sketches of concept development
- creation and synthesis of graphic elements for the final communication outcome
- application of critical analysis and self-evaluation techniques
- production management of deadlines for completion of tasks
- preparation and presentation of final designed outcome.

Individual contribution (assessed as adequate attendance, engagement with weekly exercises + participation in studio work + contribution to studio critique each week), 10% of final mark. Includes: adequate attendance (at least 80%), active participation in studio exercises and critique and contribution to group studio discussion and feedback sessions.

Appendix two. Sample grading sheet.

STUDENT NAME student@uni.edu.au

Your journal contains evidence of critical self-reflection on work executed in studio, exploration of studio themes in collected samples that go beyond the requirements of the brief and application of your observations to homework exercises. You have demonstrated your capacity to inform your own judgement on learning about design by seeking + responding to feedback and through analysis of professional design outcomes. You are looking beyond mere description to analysis of design elements and layout as to how they relate to the design concept or theme and the client's product or service. You have enhanced your understanding of these elements and their use/effectiveness in design further by researching further information through library or internet, about design outcomes that specifically relate to the brief from each week. Your layout exercise is particularly effective, and the application using image and text humorous, yet shows your approach of isolating one key aspect of each concept to strengthen the meaning.

You have used the group presentations to conduct additional research into cultural and historical contextualisation of design processes, function and aesthetics. Your natural curiosity about these has enabled you to move beyond the course brief and conduct additional experiments in each exercise, particularly strengthening your typographic poem and type and image outcomes, by trusting your instincts and making decisions based on your observations, rather than intentions. This culminates in your thorough preparation and reworking of the magazine layout, demonstrating your capacity to respond to feedback, and seek independent information that assists you in informing your judgement about your own learning.

	Completed		Weighting	Mark	%+grade
Group presentation		x	10%	9	HD
Exercises	shape	x	15%	13	HD
	texture	x			
	colour+tone	x			
	composition +layout	x			
	typographic poem	x			
	type+image	x			

	Completed		Weighting	Mark	%+grade
Journal	Weekly visual research	x	15%	14	HD
	Collected samples	x			
	Personal reflection	x			
	Additional weekly information	x			
	Group presentation notes	x			
	Bibliography	x			
Magazine spread	Typeface research	x	5%	5	HD
	Magazine layout	x	5%	4	D
Total			50%	45	90% HD

Project feedback. Your journal shows an excellent depth of analysis into the location and visual impact of the poster, as well as the results of seeking additional information into the complexity of such a contentious issue for parents and their daughters. You have demonstrated persistence and integrity to investigate the issue, understand and articulate the audience attitudes and develop the creative solution that attempts to link them, and using a call to action that is credible, yet positive. Your journal documents your engagement in critical self-reflection, based on class feedback. The project progression and its outcome represent a consistently high standard of enquiry and willingness to go the extra lengths to explore, interrogate and create suitable graphics solutions to pressing social issues as you act as an agent for social change. My only suggestion would be to move the logo down to the bottom of the page replacing the lid of the makeup jar. The aesthetic is suitable for the target audience, and the message clear, even though, as you state, your own preference is for the more sophisticated version – this is often how it works, being able to separate taste from potentially more suitable design solutions. Well done. I have taken yours as an example to show later students, thank you.

Project 1 : public graphics	**Completed**		**Weighting**	**Mark**	**Grade**
Found poster presentation	Peer assessed report on found poster	x	10%	9	HD
Research: presented in chronological order	Primary: creative iterative design development, original images, personal interviews, sketches, graphic experiments, concept + iterative design development, 2 roughs showing two conceptual approaches expressed in different graphic forms/styles	x	15%	14	HD
	Secondary: information sourced + accredited, including documented reporting, statistics + scholarly enquiry	x			
Concept statement: written in bullet form	Design concept: key idea/theme that drives the approach + meaning of the outcome, expressed in one clear statement (why)	x	15%	14	HD
	Design layout: description + rationale for the use of design elements, structure, contrast, text, image (how)	x			
	Audience: demographics, shared physical features + psychographics, shared values, beliefs + attitudes (who)	x			
	Format + location: poster/billboard, size, orientation, image of location (where/when)	x			
	Key message: (what you want to say to target audience about the issue)	x			
	Sponsor/author: an appropriate sponsor applied as a logo (who's speaking to the audience)	x			
	Intended audience response: expressed in a call to action as a reasonable + credible statement (what you/	x			
	Sponsor wants audience to do about the issue – should coincide with the aims of the sponsor)	x			
Layout + composition	Design development of two different graphic ideas, + the effective use of design elements, composition and structure (how well you select + position appropriate design elements in two dynamic layouts)	x	15%	13	HD
Communication success: assessed against written concept statement	Effectiveness of communication in poster/billboard format (how well you have communicated the issue and its call to action to the audience in the media form).	x	40%	34	HD
Presentation	Poster printed to scale on A3	x	5%:	5	HD
	A4 collage print of poster in location				
Project total			100% > 40%	89 > 36	HD HD
Individual contribution	Attendance (at least 80%)	x	10%	9	HD
	Active participation in studio exercises	x			
	Contribution to group critique	x			
Semester total			100%	90	HD

Appendix three. Example of a student negotiated learning contract.

AMENDED Learning Contract

Learning Objectives

To understand how I learn and my Design Process. Synthesizing visual elements from my Design investigations with Typography

Learning Resources

1. My own collected works, diaries.
2. Digital Image Capture
3. Internet
4. Library

Learning strategies

1. To source and build upon my own library of design and photography; as a foundation to my investigation of Graphic Design and Typography. To create designs using multimedia, and some computer manipulation.

2. To follow a series of 'jump-in' exercises. Using mainly black and white, investigating texture, shape, type, as forms of expressing Design associations. These are based on inspiration from both my own explorations into Graphic Design and researched designers.

3. To create a documented installation of work [modules]. A collection of works that define my investigations into texture, shape and form synthesized with typography.

Outcomes

1. A Process Journal documenting the design process, feelings, observations and experiments for the weekly exercises and final project. [30%]

2. A varied series of 'Jump-In' exercises that acted as a learning framework, whilst also broadening my understandings of Graphic Design. [30%]

3. To create a documented installation of Graphic Design [modules] exploring Identity, Self and Growth. A series of investigations into imagery and typography. An accompanying album of photos of works installed. [40%]

Timeline

Week 9 – 22 September	Weekly exercises, Discussion of Final Project Concept
Week 13 – 28 October	Final Project / Learning Journal



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AN ALTERNATIVE METHOD OF COMMUNICATION BETWEEN CLIENT AND DESIGNER AT THE "FUZZY FRONT END" OF THE DESIGN PROCESS

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Abstract

Communication plays a key role in identifying underlying business values to be interpreted through design, particularly when the client is new to the design process. This paper describes an alternative approach to establishing an understanding of business values[1] communicated between small business client and graphic designer during the information gathering stage in the design process commonly referred to as "the fuzzy front end" (Press and Cooper 2003:58).

The graphic designer's role during this information gathering process involves a multi disciplinary approach incorporating communication, management and marketing influences (Van Riel 1992; Johnson and Scholes 1993). Semiotics plays an important part in interpretation of business values through visual communication (Saussure 2000: Barthes 1993; Bernstein 1986; Floch 2000; Kapferer 2001). These areas of expertise can remain untapped in small business practice (Walker 1990). In carrying out a design project, the graphic designer requires firstly to understand the values of the business and then to represent those values through design.

This paper will describe research carried out through multiple case studies, reporting data analysis results. To conclude, a discussion regarding implications of the alternative approach developed within the research will be considered in relation to both the graphic designer and small business client.

Introduction:

The "fuzzy front end" refers to the information gathering stage in the design process where the designer is involved in understanding the client's business from a strategic perspective (Cooper and Press 2003:58). The main source of information available to the small business is during the business start-up process, where it is guided through a business plan, provided generally by enterprise organisations. A plethora of information on formulating a business plan is easily available from a multitude of sources from various perspectives. However, little information is available for the small business as it considers continuing development of business values relative to information required by graphic design practice. The small business' values require to be reassessed due to the evolving nature of the development of the business as it matures and gains an understanding of its values through market presence and trading experience.

The scope of this research identifies that the end users of a tool (Communication Design Tool)[2] developed within the research

[1] Within the context of this research the term 'business values' refers to the uniqueness associated with the business through an evaluation of the business by its members. Business values cannot be identified in isolation. The author adopts Saussure's theory of linguistic value as an analogy of business value 'A community is necessary in order to establish values. Values have no other rationale than usage and general agreement. An individual, acting alone, is incapable of establishing a value' Saussure (2000:112).

[2] The term 'tool' is used within the context of this research as a systemised approach to the communication process between client and designer concerning a common understanding of core business values. The term 'tool' within the context of this paper will be accompanied by the acronym CDT (Communication Design Tool) as referred to within the research.

involved graphic designers working with small business clients. The random selection of small businesses selected for the research reflects the random nature of businesses that buy-in graphic design services.

Johnson and Scholes stress that corporate strategy should be viewed as an evolving process in line with environmental influences, stating that:

> The ability to sense changes in the environment is important because perceived changes in environment influences signal the possible need for changes in strategy; they throw up opportunities and warn of threats (Johnson and Scholes 1993:107).

An understanding of business values is an important communication tool both internally and externally as an integral aspect of business strategy. In small business practice, the need to formalise an understanding of business values is generally set-aside until such times as it becomes necessary. This usually happens when additional funding is required, and in this respect information is generally tailored to meet the criteria of the relevant financial institutions' requirements (Story 2002:58). Another area that requires information on small business values is when the business communicates with a graphic designer.

It is argued that an explicit understanding of business values, as an ongoing development process, is essential in any business that require to communicate accurately to its stakeholders and many audiences (Johnson and Scholes 1993; Jobber 1995; Drucker 1998; Van Riel 1992; Olins 1989, 2003; Cooper and Press 1997; Press and Cooper 2003; Bernstein 1986; Ind 1997; The Design Council 2006).

The business plan serves to tentatively project future business development but it is not until the business matures that it begins to understand where it fits in the market place, its customer base, objectives, attributes, ethics and origin. It is at this stage of small business design maturity that, according to Walker (1990) a need for professional design input is recognised. The small business has some form of visual communication in place that may or may not have been professionally designed. This first rung on 'the ladder of design maturity' (*ibid*: 43-46) where professional graphic design services are employed, provides a challenge for the small business to make explicit an otherwise implicit understanding of their core values. In order to represent core business values visually, the graphic designer must first understand the specificities that describe small business core values.

It is at this stage in the graphic design process, in dealing with the small business client, that problems arise: without a structured method of gathering information and/or adequate budget to work with, the designer is left hoping that all relevant questions have been covered, filling gaps with guesswork and intuition. Formulating questions to obtain an understanding of core business values presents problems for the inexperienced graphic designer. One of the main contributing factors which leads to poor design solutions is where the designer does not understand the business (Bernstein 1986; Press and Cooper 2003).

When commissioning design to interpret identity, Dickson reports that the design process is "much more intangible" than understanding the "processes" and "strategy" that make up the uniqueness of an organisation (Dickson 2001:31).

Challenges presented to the client during the information gathering design process involve:

> **1.** The small business has difficulty in formulating an understanding of their core business values.
> **2.** The small business has difficulty in communicating those values to the graphic designer.

These challenges provide essential "fuzzy front end" information that serves to underpin the design process (Press and Cooper 2003:58).

Research methodology

The methodological approach adopted involved participant observation and action research. The first case study was based on participant observation (Yin 1993; 2003). During the second and subsequent seven case studies, the research changed to action research (Denzin and Lincoln, 2003; Ladkin, 2005).

Participant observation and action research

Participant observation was the first method adopted within this research, due to the nature of the phenomena surrounding designer and client. The author was involved in the research as design practitioner, participant observer and facilitator of the entire process.

The first study clarified the need for a method to better inform the design process.

The remainder of the research set out to improve problems perceived within the phenomena through action research methodology (Denzin and Lincoln, 2003; Ladkin, 2005).

Procedure: Case study process

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Establish proposition	Pilot the tool (CDT)	Develop the tool (CDT)	Trial the tool (CDT)	Request feedback
Case Study 1	Case Study 3	Case Study 6	Case Study 3	Case Study 3
Case Study 2	Case Study 4	Case Study 7	Case Study 4	Case Study 4
	Case Study 5	Case Study 8	Case Study 5	Case Study 5
		Case Study 9	Case Study 6	Case Study 6
			Case Study 7	Case Study 7
			Case Study 8	Case Study 8
			Case Study 9	Case Study 9

1st Graphic Designer

2nd Graphic Designer

3rd Graphic Designer

4th Graphic Designer

Figure 1. Development of COMMUNICATION DESIGN TOOL: Research process

Phase 1 – Establish the proposition
Case study 1 – elucidate the research proposition by identifying the need for an improved method of communication between client and designer
Case study 2 – establish the content of information to develop a tool (CDT) in relation to a complete graphic design process
Phase 2 – Pilot the tool (CDT) with its end users i.e. small business client and graphic designer
Case study 3, 4 & 5 – iteration process, formulating the content of the tool (CDT)
Phase 3 – Develop the tool (CDT) with small business clients and graphic designers
Case study 6, 7, 8 & 9 – intensive iteration process, developing and refining content
Phase 4 – Collate information and provide analysis
Phase 5 – Disseminate results through reports, clarify to respondents' satisfaction and conclude the field research by asking for feedback regarding the usefulness of the tool (CDT)
Case study 3 - 9

Research methods

Participant observation was particularly relevant during the first case study, where practice based participant observation was essential to experience in the field situations and elucidate the research proposition. During the first case study, the need for a tool (CDT) to aid the communication process between small business client and designer was elucidated.

The tool (CDT) was then developed in collaboration with small business clients and graphic designers who work with this client base. Action research became necessary as a research approach during this process, due to the iterative nature of developing the tool (CDT).

The iteration process involved a continuous process of information gathering and analysis. The results influenced each sequential phase in the research process: key information from phase one informed phase two and so on, as shown in figure 2.

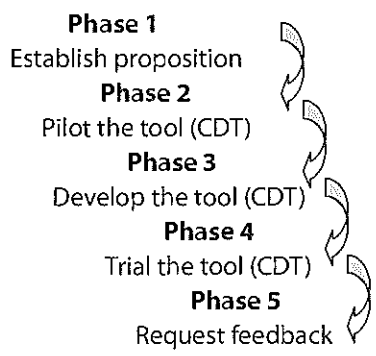


Figure 2. Development of COMMUNICATION DESIGN TOOL: Iteration process

During phase one of the process the first two case studies provided elucidation of the research proposition and identified the need to develop a facilitation tool (CDT). In collaboration with a pre-determined selection of a further seven small businesses and four graphic designers, a prototype tool (CDT) was developed to unpack management and marketing models in an attempt to make implicit core business values explicit. This was initiated through a tool (CDT) in the form of a questionnaire to be completed by principal stakeholders and customers where possible, within each business. The intention of the tool (CDT) was to establish a state of play of the business in terms of perception of business values and later, graphic design preferences.

The tool (CDT) was offered as a paper-based format for the purposes of information gathering and development. Completion of the tool (CDT) resulted in an individual profile of four general areas of information required to inform the graphic design process of key business values and graphic design elements. This process was carried out within the seven selected businesses.

These four main areas of the tool (CDT) included:

1. Basic business information.
2. Competitors' visual language.
3. Core business values.
4. Graphic design preferences.

The business value section of the tool (CDT) (3.Core business values) draws from facilitation models applied within communication, management and marketing.

The tool (CDT) provides a platform for emerging core business value terms, graphic design elements and an understanding of the visual language of small business competitors. The tool (CDT) was to be completed by principal stakeholders, including customers where possible from each of the selected small businesses.

Translation of business values into graphic design visual guidelines

The next stage in the process was to translate business values into a set of visual guidelines. These guidelines, having emerged as a result of the development of the tool (CDT) and clarified by the small business, informs the graphic design process through a pre-design brief analysis. A report distributed to each business representative concluded the development and analysis of the tool (CDT).

To conclude participant research, interviews were conducted with each business representative. At this final stage in the research, the business representatives were asked to evaluate the viability and level of success of the tool (CDT) as 1) a useful process of information gathering and also 2) whether or not the procedure provided a better understanding of the graphic design process in determining business values to be interpreted through visual communication.

Visual communication

The term visual communication is located within the semiotic paradigm. Visual communication literature is influenced by Floch (2000), Bernstein (1986), Schirato & Webb (2004) and Morgan & Welton (1992).

Floch defines his pictorial discourse approach to semiotics as "an object of meaning through bricolage" (Floch 2000:2). According to Floch, a bricoleur "not only builds a collection of facts of usage (that are not necessarily stereotypical) but also adapts and reworks them" (Floch 2000:38). In exploring visual identity as it is produced bvy bricolage, underpinned by cultural anthropology, Floch realised that the language used was referred to as "a community of value" Floch (2000:7-8)

Underpinning corporate identity concepts depicted through visual communication are represented through symbolism as a visual identity, meaning: "it [symbolism] ensures the recognition and proper positioning of a commercial enterprise" as "an expression of the company's specificity" (Floch 2000:32).

Business values are translated through visual communication, involving semiotics to ensure that "the packaging, product design or logo signify what they are supposed to signify" (Floch 2000:9). Visual communication translates values through symbolism involving metaphor as complex and often lacking continuity "Symbols help us to communicate. Man is a natural user of analogy and metaphor" (Bernstein 1986:35). Symbolism, in terms of corporate identity and logos are explored by Floch (2000) and Bernstein (1986).

Through semiotics, graphic designers can trace the cultural and visual elements applied in creating a visual language, specific to their clients' business sector. In this way graphic design translates business values through the semiotic discourse of visual communication.

Request participant feedback

A final interview process with each of the seven small business representatives concluded the collaborative research. Two closed questions were asked of each representative regarding evaluation of the tool developed during the research process. These questions were key to validating the relevance of the tool and the research itself. The two questions concerned: 1) Is the tool (CDT) something that you would use? 2) Has working with the tool (CDT) given you a better understanding of the graphic design process?

All respondents reported that they would use the tool (CDT) and that in using it, it has demystified the graphic design process.

Analysis

Content analysis was selected as a technique for textual data analysis. The main and most common concern with content analysis is that although the number of times a word is used can be calculated, the meaning and context of the words in question remains ambiguous. The relationship between words within the context of the phenomena is more relevant than counting words or categories as a method of analysis.

In this respect, a hands-on coding method of data analysis was adopted, working with the text through multi-coding categories, looking for patterns, checking the data against the research proposition and other data collected (Bailey 1996).

Evaluation procedure

The procedure used to elucidate the need to develop a tool (CDT) to improve the communication exchange between client and designer during the information gathering stage in the design process was carried out through an intensive iteration process involving: a) the author as participant observer, action researcher; b) semi-structured interviews with four graphic designers and eleven interviews connected with participating business members; c) four graphic designer evaluations and d) nine case studies. Involvement of the end users as active participants throughout the entire development process of the tool (CDT) was central to the research methodology and resulting outcomes.

Graphic designer evaluation was carried out at each phase in the process to ensure that the development of the tool (CDT) was also aligned to graphic designer needs. In selecting four graphic designers who have experience of working with this client base, an evaluation of the tool (CDT) was carried out from four graphic designers' perspectives at four stages during the development of the tool to ensure that measures were taken towards obtaining an objective, unbiased participant perspective.

Resulting implications of applying the tool

Obtaining first hond informotion of smoll business core volues

As a direct result of using the tool, the graphic designer is provided with information on small business core values and market competition generated by the small business client.

Information gathered to inform the graphic design process is carried out by the small business client. The fuzzy front end of the design process is replaced by information provided directly from its source i.e. selected small business stakeholders. In this respect, the resulting information represents a more considered evaluation of small business values.

Various state-of-play methods that elicit an understanding of the business from its source i.e. stakeholders have been evaluated. Corporate communication methods such as Lux's Star method and Bernstein's Cobweb method have been adapted to evolve an understanding of small business corporate identity (Van Riel 1992:50-52).

The end purpose of gathering information on the small business relevant to this research is to inform the graphic design process. Methods applied to elicit this information have been influenced by corporate communication practices, especially Bernstein's Cobweb method (Van Riel 1992:52).

The smoll business controls communicotion of core values

As a direct result of using the tool (CDT), the small business is responsible for providing information of core values from selected stakeholders within the business.

In engaging with the tool (CDT), the small business controls information communicated to the graphic designer and by taking this level of control, is also responsible for supplying that information. This can result in a safety mechanism during the communication exchange between client and designer prior to carrying out any design project. A sense of empowerment was reported from several small business representatives in undertaking this process.

At the particular stage in the small business's development in terms of: a) design maturity (Walker 1990); b) development shift into managerial roles (Storey 2002) and c) growth development stage (Scott & Bruce 1987), the small business is ideally placed to formulate an understanding of business values, facilitated by the tool (CDT). According to this research, all graphic designers reported that at business start-up, the business is not mature enough to understand its place in terms of where it fits in the market.

At the stage of the small business's development specified in this research, the small business seeks professional graphic design input. This requires the small business to communicate core values to the graphic designer that will inform the graphic design process, as detailed in figure 3.

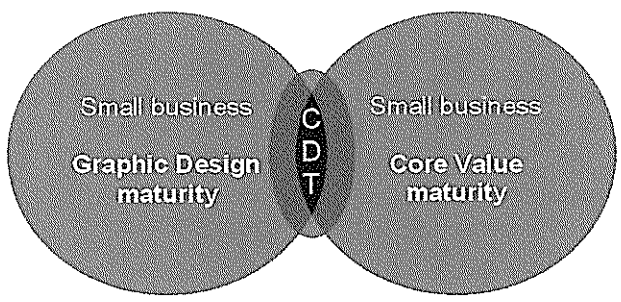


Figure 3. *Identification of need* to formulate an understanding of small business core values in relation to level of growth development (Scott and Bruce 1987) and design maturity (Walker 1990).

Without sufficient understanding of core business values, the communication exchange between small business client and graphic designer is inadequate, leaving the designer to rely on guesswork and intuition (Cumming and Malins 2006:159-167).

In this respect, an information gap exists regarding the need for a more informed method of communication within the small business market sector as identified within this research. This research has revealed that information sourced to assist the small business in understanding its core values at this particular stage in its development is problematic. The literature search found that at the time of writing, there is little UK information on the graphic design information gathering process available to the small business client.

Common language between small business client and graphic designer

The tool (CDT) engenders the basis for a more informed communication exchange that connects the small business with the language of graphic design. Therefore, in using the tool (CDT), the resulting communication exchange crosses disciplines and engenders a platform from which a more common language between client and designer can begin to emerge.

Dealing with small business respondents throughout the entire engagement with the tool (CDT) as a communication process, the author was required to explain graphic design terminology to most of the small business representatives. Several comments made by small business representatives throughout the process, relating to graphic design terminology is reported as:

Case study 3: 'What does font mean?'.
Case study 4: 'What does the Nike Swish mean? What's that? How would this section work?'.
Case study 5: 'Bamboosled [sic]! Need you [the author] to talk me through the design section'.
Case study 6: 'What do you mean by symbolism?'.
Case study 7: 'We have a logo, why do we need a symbol?'.
Case study 8: 'Could you explain what graphic design is, and what does a graphic designer do?'.
Case study 9: 'This demystifies graphic design'.

The researcher clarified that problems exist during the communication exchange of small business values between client and graphic designer, prior to any design project.

In offering an alternative method of communication exchange during the information gathering graphic design process a focus shift occurred. This involved the small business in gathering information and not the graphic designer. This focus shift occurred as a direct result of applying the tool (CDT) as an alternative to the "fuzzy front end" communication process (Press and Cooper 2003:58).

Existing graphic design practice involves the designer taking responsibility for gathering information on the small business, as the research has evidenced through interviews with four graphic designers experienced in working with the small business client. The domino effect of this focus shift impacts on various aspects of the role of graphic design in working with the small business client.

Communication Design Tool

The aim of the research was to provide a tool (CDT) to better inform both the graphic designer and small business client through a more explanatory process of aligning graphic design components to small business values. The tool (CDT) aimed to involve the client at an early stage in the design process and thereafter empower the client to update relevant information as the business evolves.

In involving the small business client in the graphic design process at the earliest of stages, i.e. the information gathering stage, both the small business and graphic designer are better informed through applying the tool (CDT) as an alternative communication conduit. The small business is exposed to the graphic design process as a direct result of working through the various constituent aspects of the tool (CDT). The graphic designer is better informed of the businesses' core values, key competitors and stakeholder perception of graphic design elements provided by information gathered by the small business and evidenced within the tool (CDT).

The communication exchange, as a direct result of using the tool (CDT), informs the small business of the graphic design process and how graphic design communicates values: By deconstructing the graphic design process into elements that can offer meaning in relation to the cultural environment of the specific small business market sector. An understanding of how design communicates values evolves as a direct result of client and designer exploring and mapping graphic design elements that are aligned to business values. This is as a direct result of client and designer engaging with the tool (CDT).

Existing graphic design practice recognises that in working with the small business client, the language of graphic design is explored on a need-to-know basis, i.e. where the client does not understand why certain graphic elements have been used and also the way in which those graphic elements communicate business values. The graphic designer explains the theory behind the concept but as the small business client is unfamiliar with the visual language of graphic design, the explanation provided does not always clarify meaning. In engaging with the tool (CDT), graphic design elements are deconstructed and explored further by offering examples of graphic design elements that clarify meaning as a result of client and designer discussions.

An important aspect of the tool (CDT) is that it forms a platform for a deeper level of communication between client and designer by deconstructing graphic design elements and aligning those elements to similarly deconstructed business values.

Where the client questions the alignment of core business values with graphic design elements, the designer can provide an explanation of business values communicated through graphic design elements and therefore in engaging with the tool (CDT) an educational platform is provided. The mechanisms of the tool (CDT) reflect Bernstein's illustration of the communication process, depicted in figure 4 (Bernstein 1986:32).

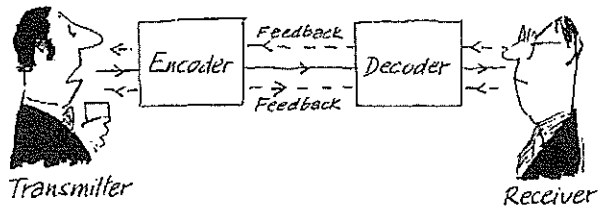


Figure 4. Bernstein's example of the communication process. Source: Bernstein 1986:32.

Interviews with the four graphic designers revealed that educating the small business client in the design process involves an integral aspect of working with this client base. The small business's level of design maturity is minimal, as graphic design is generally the small business's first exposure to professional design (Walker 1990:43-46).

An alternative method of communication exchange between client and designer

The benefits regarding an alternative method of communication exchange concerning the graphic designer are firstly that the graphic designer is provided with first hand information on the business directly from source. In this way the business controls the information provided to the designer and subsequently takes responsibility for gathering appropriate information as specified within the tool (CDT).

Secondly, in providing information on core business values to the designer, the small business takes responsibility for the nature of the information provided and also absorbs costs incurred in formulating the information. The designer is therefore provided with information that can be used to trace back design concepts aligned to core values *before* they are developed into design solutions.

The designer is also provided with information that can reveal and guide subsequent formulation of design concepts. The information provided by the small business as a result of using the tool (CDT), enables the designer to evaluate the small businesses level of graphic design understanding regarding graphic design. The designer then has the opportunity to explain the way in which the selected graphic design elements communicate (or otherwise) resulting business values i.e. how design communicates values. The information provided by business stakeholders in completing the tool serves as a valuable communication conduit between client and designer.

Conclusions

Information gathered as a direct result of using the tool (CDT) serves as an important communication platform from which to better inform the graphic design process.

The tool (CDT) as an alternative approach to gathering information on small business values shifts responsibility from the graphic designer to the small business.

Existing communication exchange between small business client and graphic designer fails to provide the designer with adequate understanding of core business values necessary to underpin the design process. This often results in inappropriate design solutions (Phase 1: Case study 1).

The small business client had not formulated an understanding of its values at the point of contact with the graphic designer (Case study 1,2,3,4,5,7,8,9). At this specific stage in the small business's development where it required design solutions to communicate certain aspect of its business, it did not have the tools with which to formulate an understanding of its core values.

The literature revealed (UK) that little information is available on formulating an understanding of business values at the stage of development identified within the scope and context of this research. However, literature is available to the small business concerning business start-up information in formulating a business plan or funding proposal. Information relating to management and marketing models that guide the development of understanding medium and large business values provide useful forward insights but do not serve to address the small business needs defined within the scope of this research.

The resulting focus shift occurred as the tool (CDT) was applied during this research in gathering a body of relevant information generated by selected stakeholder evaluation to better inform the graphic design process. In applying the tool (CDT) at the information gathering stage in the design process, other aspects emerged as beneficial to the small business and graphic designer. One benefit that emerged regarding the small business was that in formulating an analysis of core business values, all selected stakeholders were involved in the process.

The dialogue that surrounds the analysis is in some aspects more important than the results. Bernstein's Cobweb method where key decision makers decide on key terms of reference in respect of perceived business values identifies that analysis

of stakeholder input can provide an invaluable understanding of stakeholder perception of the business.

As a result of undertaking this process, the analysis in terms of an evaluation of stakeholder perception, reflects how individual stakeholders communicate business values to the businesses many audiences.

Lastly, the research acknowledges that the tool is not a prescribed form of communication. The resulting guidelines are offered to inform, not to dictate to the graphic designer. Applying the tool to the fuzzy front end of the information gathering stage in the design process, the designer can use the resulting information as a basis from which to develop concepts and solutions through a more informed communication experience between client and designer.

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THE RDLE DF THE LEARNING CDNTEXT AND DESIGNER CHARACTERISTICS CHALLENGE AND REVEAL THE DESIGN PRDCESS

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Abstract

This paper discusses how designing is much more than the execution of a process toward an end product that satisfies a client brief. Instead design and designing are integrated with a designer's personal philosophy, understandings and attributes, relationships with others, and the nature of the project.

The project to be described in this paper explores how context can mould the experience of designing at a personal and collective level, and thereby, influence the resultant outcome. The project's focus offered the potential to monitor how students respond to the design process in a multidisciplinary environment. The findings indicate that students and staff were enthusiastic about the opportunity to participate in a community service project and that student engagement was influenced by their expectations, individual personalities, and group dynamics. It was also demonstrated that these influences were facilitated by the learning environment and impacted on the design process.

Therefore, it is proposed that university students respond to projects that demand high levels of engagement and real world context. The students bring to that process rich experiences and knowledge in an integrated manner. The interrelationship between the design, the designer, and the context is therefore, an essential consideration for design educators and practitioners when fostering teams and tackling design projects.

Introduction

The focus of the paper is a community service project to design an **educational tourist centre** for the Save the Bilby Fund located in Charleville, South West Queensland, Australia. The design was undertaken by a **multidisciplinary team of students, staff and professionals** from architecture, engineering, interior design, industrial design, and landscape architecture. It was an elective for the students and the staff volunteered to be involved in the design team.

Understanding *what it is to design* is discussed through reflection and evaluation of two design workshops that were the core activities of the project. The project altered student perceptions of design, of their own discipline and of the other disciplines, and insights into their personal attribute and personality were possible. Collectively these aspects clearly indicated that the design is a product of the evolving experience of designing and that design cannot be understood holistically if discussed simply as method or process. Design therefore has the potential to be transformative in its nature.

THE PROJECT

The facility to be designed was the vision of zoologist Peter McRae who envisioned a centre that would educate the public about the ecology of semi-arid and arid areas with particular emphasis on underground systems and their interdependency with our everyday life. The Australian marsupial *Macrotis*

lagotis, commonly known as the *bilby*, is the iconic animal used to demonstrate the potential for alternative lifestyles in these severe regions. The income from the non-profit facility to be located in Western Queensland, Australia will fund research into Australian endangered species.

It was considered imperative that the design teams visit Charleville in order to appreciate the context of the site and of the native flora and fauna. Therefore, the student project involved two intensive design workshops. The first workshop in 2004 consisted of nine students and three staff on site for one week. It provided a strong conceptual basis and briefing document for future work, as outlined in depth in Smith, et al. (2005). The work resulted in a set of guidelines for undertaking multidisciplinary projects with emphasis being placed on the advantages of block teaching, the involvement of the client, and an intimate knowledge of the site and the community stakeholders, in order to foster engagement and an in-depth understanding of a project.

Limitations identified in the first workshop were addressed in the second workshop held in 2006. These included the need for a longer period of immersion for block teaching, a greater understanding of the semi-arid location-based constraints, greater clarity in regard to staff expectations and a more explicit educational structure to underpin the teaching and learning approach adopted. This workshop involved fourteen students from four disciplines who formed two teams, and five staff members working with consultants and clients over a two week period in Charleville.

The structure of this second program consisted of an orientation and briefing session, preliminary research by the students, a series of staff or expert presentations involving exemplars and visuals which provided base knowledge about the client, the disciplines, the context, and possible approaches to tackling the project. Student presentations were held at the end of week one and week two; the first presentation (in the spirit of collaboration) was to the client and council in order to receive feedback, and the second to the client, council, and community as part of the community consultative process.

In both workshops the format of sessions was largely directed through discussion as the project unfolded with debriefing and briefing sessions occurring each morning. Social activities were also an important part of the learning context. This open and enthusiastic working environment stimulated engagement and productivity.

Work-in-progress was displayed on the walls to stimulate discussion and as a point of reflection. Activities outside the 'studio' served to allow some down-time while being necessary for the project. These included site visits and visit to the bilby enclosures. In addition, to fit in with the sustainability design theme of the project, the students designed and constructed a small scale rammed earth wall from local soils, which became part of the overall design project. The objective of the exercise was to give all students a better understanding and appreciation of alternative building materials and construction techniques. The constructed wall was subsequently monitored to examine beneficial thermal properties. This activity also served as a hands-on team building exercise.

DEVELOPING A TEACHING and LEARNING FRAMEWORK

Assumptions concerning three aspects of student learning—interdisciplinary interaction, design methodology, and the engagement of adult learners—were made.

Adult learners: Adult learners are known to require meaningful learning experiences and 'vital involvement in one's world as opposed to the spurious flirtations of youth' (Erikson in Tweedell 2000, p.3).

> 'Dewey believed that learning best occurs within an institution which will not obstruct experience... A progressive institution will shape experience by reorganizing the surroundings and providing an environment that will promote growth. The outcome should be a fully integrated personality whose successive experiences are integrated with one another. This is the creation of self control gained through a product of reflective learning' (Tweedell 2000, pp.2-3).

Tweedell (2000, p.4) states that education of adults should in fact 'transform individuals so they may change society' as had been posited by Mezirow and Freire.

It was therefore proposed that a learning environment that provided an opportunity for university students to be embedded in a real project would prove to be stimulating and meaningful for them. Our project revealed in a first-hand manner the inherent complexities of the project, the stakeholders, and working with other consultants.

Design Methodology: In addition it is known that designers come to a design problem with different understandings of what it is that they are doing. Franz (1997) in her study of the conception of interior design demonstrated that architects and interior designers working in this field may have one (or more) conceptions of designing experiential, structural, production or retail. Their conception will underpin how they go about the process of designing. Franz quotes Marton's definition of phenomenography applied to educational research, as '...mapping the qualitatively different ways in which people experience, conceptualize, perceive, and understand various aspects of, and various phenomena in, the world around them' (1997 p.11). Students with differing backgrounds may have differing understandings of the task set and how to undertake designing.

The Charleville workshops provided an opportunity to work to reveal these differences and to reflect on the advantages and disadvantages each may have. Franz's typology also enabled us to critique the process evidenced through the work, images and reflections after the workshops to analyse what had occurred.

Interdisciplinary Interaction: Associated with the diverse understandings of the individual students (and staff members) was the interdisciplinary nature of design teams. The potential to address complex and ill defined design problems or situations through a transdisciplinary approach recognised in that new and innovative solutions can emerge from the blurred edges of discipline discourses and practices. Transdisciplinary activity takes 'as an article of faith the underlying unity of all knowledge' and as a consequence works beyond the discipline boundaries (Newell 1992). As highlighted in Smith et al. (2005), disciplines have distinct set of knowledge, theory and practices, and therefore, 'collaboration involves relating or integrating knowledge and methods for each domain' (Squire 1992 p.7), because as Squire points out, 'the discipline culture (philosophy, values, or understandings of the world) is not taken into such an account. In contrast, disciplines have also been described as a loose field consisting of many subfields' (Squire 1992) and each may have stronger links to the core subfields of other disciplines (Becher 1990).

How an individual perceives the way disciplines should interact will influence how he or she goes about the project and in the case of educators how they establish the context in which group activity is undertaken. As Newell (1992) observed, those seeing interaction only in operational terms will tackle the project by seeking to identify discipline topics to cover and/or references to contribute. However if a broader understanding is held, the interaction will seek to identify and embrace philosophical differences through interdisciplinary engagement. The bringing of discipline knowledge to a problem in the role of 'expert' can be limiting and may reinforce current or known approaches and resolutions. The processes may be built upon consultation and compromise rather than on innovative collaborations.

Therefore, the second workshop explicitly encouraged students to interrogate the problem in a holistic sense—to bring professional and personal experiences, as well as common sense understandings, to the task. During the second week, students were encouraged to also contribute their specialised knowledge once the problem had been explored and defined by the group. It was anticipated that some students might have difficulty breaking old habits when presented with such freedom to engage with a situation especially when it was 'real'. The two week session was therefore designed so that the students were required to bring the work to an endpoint in the company of others; thereby addressing the fracturing that had occurred in the first workshop (Smith et al. 2005).

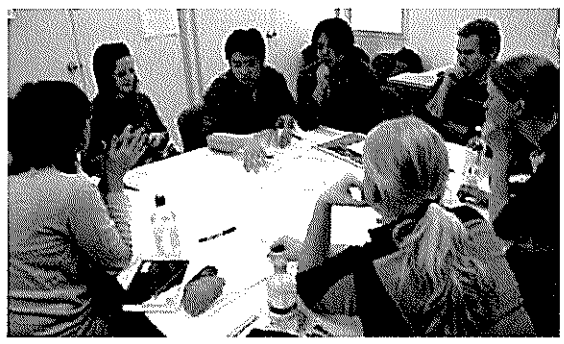


Figure 1. One of the teams analysing the site constraints.

METHODOLOGY

This paper reports on an ethnographic approach in order to research the experience of design by the participants. The staff members were also participants in the design workshop, however, their input was as managers of the workshop structure and to ensure that the overall objectives were embedded as the studio unfolded.

Ethnography is defined by Delamont as"...spending long periods watching people coupled with talking to them about what they are doing, thinking, and saying, [and] designed to see how they understand their world" (Delamont 2004, p.218). It is also noted that as a researcher who is a participant observer that;

> ...by living with the people being studied, watching them work and play, thinking carefully about what is seen, interpreting it and talking to the actors to check emerging interpretations. ...watch these things being done and 'help' occasionally. It is important to participate enough to be able to write feelingly about the nature of work: its pains and pleasures, smells and sounds, physical and mental stresses. ...'Participant' does not mean doing what those being observed do, but interacting with them while they do it" (Delamont 2004, p.218).

The data collected was drawn from a number of sources including the students' initial understandings of design, their reflections at the end of week 1 and at the end of week 2, their comments in their reflective diaries, the design-process drawings, and the staff reflections upon (and interrogation of) the photographic record of the workshop. Indicators of engagement, interaction, personal emotions, and understandings were sourced by drawing on text, graphic information, and imagery. From these it was possible to compile an in-depth understanding of how the design was not only undertaken, but in addition, how it was experienced by the participants.

FINDINGS: STUDENT AND GROUP CONCEPTIONS

The findings drawn from the above data sources are outlined below according to their origin. A summary of what is indicated then follows each one.

Initial conceptions:

Prior to leaving Brisbane at the orientation day, members of each discipline were asked to discuss and define design and the purpose of their discipline in the design of the built environment. The comments are outlined in Table 1.

Discipline	Design	Discipline role
Architecture	It is a process: logical, illogical, formal, special; reflect; creating a feeling and an experience; ensures practicality, serviceability;	Renaissance subject; Form to house function; Pushing boundaries; Experimentation with materials; Community/amenity
Engineering	It is a concept an expression, a usable space; Making things work for their intended purpose, through evolution of ideas/representation of testing	"We can make it work;" "We ensure: • it stands up • it is safe • it is serviceable • it can be built" Create a feeling and experience that meets the needs of the users;
Interior Design	About looking after environment - people relationships	Create an identity; Make the spatial relationships right "We don't just do paint, pot plants and curtains"
Landscape Architecture	A combination of skills working together	Creators of social, environmental and cultural spaces; "We are not gardeners"

Table 1. Student Comments on Design and Discipline Role

These comments indicate that the students all saw design as a process involving multiple dimensions which needed to be combined in some way through a process. However they contrasted in their conception of the purpose of the design activity itself. Architectural design was believed to address experience, practicality, and serviceability, Interior Design facilitate the relationship between people and their environments, Engineering Design makes things work appropriately, while Landscape Architecture did not identify

an endpoint for the design process. Likewise the roles identified indicated that the individuals perceived a definite role for the discipline they belonged to—architecture as an innovator, engineering to oversee safety, interior designers to address user needs and facilitate experiences, while landscape architecture as creators of integrated and responsible spaces. In addition, landscape and interior designers felt it necessary to identify clearly what they are not (gardeners and decorators).

These conceptions indicate that discipline perceptions of design is different from the other disciplines. Such differences may influence how members of a discipline; that is the students, may approach the design project and their role in a collaborative team.

Structured Reflections: Expectations

Students were also asked to respond to a number of set questions at the commencement of the project in Charleville. The purpose was to ascertain student conceptions of and aspirations for the workshop. These questions were: What do you expect the scope of the project will be? What do you expect you will learn as a result? How do you feel about the process? What knowledge and/or skills do you expect to be able to contribute in areas or ways that would be considered outside your core discipline area to the development of project?

It is evident from the responses that all students felt excited but simultaneously being worried or anxious about what would be required of them and how they may perform. For example descriptors used included:

Excited; motivated; happy; optimistic; anxious; worried; scared; unsure; concerned.

A number of students envisaged the project in practical terms. However, others anticipated that opportunities for new experiences and the need to fulfil broader client and societal goals were involved. For example:

It will involve extensive community consultation/interaction; design of a tourist centre that will educate people; an exceptional design that attracts tourists and allows them to observe and interact with bilbies; work together as a mixture of disciplines; practical/realistic design; attraction that will put Charleville on tourist map; iconic design; low maintenance eco-friendly building and landscape.

Learning outcomes identified also varied between those who predicted that skills and facts would be acquired and those who foresaw that personal development and generic capabilities would develop. For example:

How to work within a multidisciplinary group; learn from others and share own knowledge with others; teamwork; nature of ecotourism in Australia; ESD for semi-arid regions; understanding of rural Australia; to contribute to a real life design; to see from different perspectives; compromise.

In addition, the authors sought to make explicit how students perceived the discipline boundaries and integration before the project commenced. Therefore, the following question was posed: *What knowledge and/or skills do you expect to be able to contribute in areas or ways that would be considered outside your core discipline area to the development of project?*

Again it was evident that some students saw their ability to contribute simply in terms of discipline expertise while others considered themselves more holistically in terms of personal experiences, personality, and generic capabilities. For example:

Commonsense and practical approach; ability to discuss and listen to everyone's opinion; organizational skills; communication skills; motivate the team and keep everyone having fun; outback culture (S4).

Structured Reflections: Midway Experience

To gauge the students' learning experiences, each student was asked to address a number of questions at the end of week one. The first week's program had encouraged students to work outside their discipline frameworks to interrogate the problem and to explore the potential of the project.

The comments reflected different learning approaches with some students only listing *the what*. However, others discussed *the what* more holistically by stressing how personal

dimensions were already interwoven with the professional aspects. When explicitly asked how they felt, all students commented that they had commenced the project with a balance between excitement and fear reinforcing the initial result.

Structured Reflections: Overall Experience

On the second last day each student was asked to stop and reflect on the process and outcomes from their individual perspectives. The questions posed were:

Have your expectation been met?; What are the key things you have learnt?; What key things have you learnt from other disciplines and interdisciplinary teams?; and, What aspects about yourself have you developed or not that influences your ability to contribute to a team?

The comments indicate differing levels of engagement or at least a willingness to share their experiences and opinions in this way. The most common answer to *Had their expectations have been met* was "surpassed". Key things they said they had learnt include the following aspects:

- personal skills and attitudes: working in a team and controlling one's personality when things get heated; to be flexible; sharing; not to be a selective listener; a designer must become selfless;
- design process: design through facilitation, creative motivation, criticism and injection; step back and let go; experiment more; give up ideas/push ideas; fantastic brainstorming sessions; and
- interdisciplinary interaction: to liaise between different professions; team effort is the main reason for success; working in groups takes a lot longer than working individually.

The main thing that they have learnt from other disciplines is to accept that they all have something to contribute; and that, it is vital that each team member has a fair say. The aspects that they have developed that influence their ability to contribute to a team are improved listening and communication skills; a better sense of empathy; improved tolerance to people; and a better appreciation for other disciplines.

Unstructured or Informal Reflections

The informal records captured in a personal diary included reflections interwoven between notes from presentations, discussions, sketches, and lists of things to do were more revealing. A number of quotations are deliberately included below to demonstrate the depth of the experience. More particular is the transformative nature of the experience. The learning environment and the developing design process provided through this project acted as enablers for this to occur. The student reflections showed a number of issues that emerged and the associated shifts that occurred in their understandings. These are grouped below.

Type A: As individual learners:
i) Different sides of their personalities were revealed to themselves.

For example: *Before this trip I perceived myself as a leader. Since then I have questioned my ability in this role (X3);*

I was forced to socialise with the same group of people 24/7. ...This tested all of us and this INTENSITY brought forward a side to many of us we would likely display. With me, it brought out the panicky side of my personality –the side of me that fears failure and thus strives to control (X3).

ii) Understanding their own limits and attempting to develop alternative strategies.

For example: *It does not feel as though we have achieved much today –just a lot of arguing! (X4);*

...there is a huge segregation in our group but nobody seems to admit it. We need to recognise each other's input and not to be dominated by members or professions (X1).

iii) Self awareness of their ideas, process, and learning and the impact for themselves

For example:*...we all sat in front of one of the big white boards and nutted out our design. It worked really well because we could all just grab a marker, draw over the top of different options, printout, then start again. ... We worked it out as a team (Y1).*

iv) Personal attributes such as honesty and taking responsibility were adopted.

For example: *Everyone, myself included, is focused on own ideos thot it is hard to work together on one idea (X1).*

v) A high level of self awareness developed over the process.

For example: *I hove realized that I hove o good grounding in my discipline, but I by no meons understand everything obout it ond I have so much to leorn. ...we don't hove to know everything, we just need to hove the right ottitude (Y1).*

Type B: Insights into habits and preconceptions
i) They were challenged to move beyond their normal practices.

For example: *Being forced to work so intensely with others mokes you think obout whot you are doing and examine your project more corefully (Y1).*
Thinking back over the two weeks, I feel os though we did achieve o lot even though most of the time it got reolly stressful (X2).

Type C: About design and designing
i) Understand at a profound level that design is not for the self or for one's own ego.

For example: *Another thing we need to stop is designing in our egos. The designers need to design for the cause rother thon myself, ourselves (X3).*
As a design group one of the most importont things I leornt is to design to a sense of selflessness (X3).

ii) They came to understand that design is embedded in emergent theory and the need to let things to be revealed through the process.

For example:*...todoy reolly proved to me thot sometimes it just doesn't work ond you're better off to just toke o breok... (Y1).*
The next couple of days are sure to be intense but I don't core. I con't woit to see what we come up with! (Y1).

Type D: about the process
i) The importance of inquiry and asking questions.

For example:*This has been the most valuable subject I have taken as it is helping me to consolidote everything I've learnt so far and making me reolise how importont it is to osk questions ond work with other people (Y1).*

ii) Adopting new ways of doing things that they were exposed to and learning to be in a transdisciplinary team.

For example: *I found the process very useful. I feel os though I am ochieving quite o lot in terms of design through the tronsdisciplinory opprooch (X4).*

Type E: Concerning the holistic nature of design practice
i) That whole life was important to the process and the person had formed connections beyond the present activity or project such as friendships, people to consult with, and shifts in how they saw their career path.

For example: *I feel honoured to hove hod the opportunity to work with students from other disciplines on o reol life project ond I know I've hod o tremendous leorning experience this lost two weeks. I've mode deor friends ond leornt more obout myself and my obilities (X1).*
Everyone ...creoted o bond between one onother, something thot just doesn't hoppen ot Uni these days. Moy be every course should hove something similor, os you get to know people better (Y3).

ii) Learning environment influencing how they design and what it is to design.

For example: *Design, I hove discovered, is not obout the designer. It is ...a reflection of the space (history, useobility, surrounds, client's wants) (X3).*
The site itself presents interesting chollenges. It is completely flot ... Horizontal planes reign supreme! The setting western sun is on exciting energy on site which needs to be taken full advantoge of –long dromatic shadows (X4).

These experiences and insights indicate how the process of designing is more than one tackling a design problem and compiling a brief to address. The reported understandings and conceptual shifts indicate how the learning environment and the individual are interrelated in influencing the design process and outcome. In order to understand this in more

depth, the authors have adopted two ways of describing the transformative nature of the student's learning will be discussed.

TRANSFORMATION THROUGH DESIGNING

In order to ascertain the influence of the learning environment on the transformative process indicated through the findings thus far, the psychologist, Covey's (1999) personality traits and Franz's (1994, 1997) conceptions of designing will be applied. Through this analysis, the observations made during the project can be analysed in order to demonstrate how the design outcome and process are influenced by the designer's conceptions and personality as well as the physical learning environment, nature of the project, and the client requirements. Design is an integrative process which can be transformative for the student-designer depending on the learning environment adopted.

Covey's Seven Operational Habits:

Covey (1999) describes seven operational habits that an individual can adopt. Each is defined below and are then used as a framework to discuss the 'habits' observed in the studio or reported by the students. The results indicate the students used these habits positively and negatively depending on the situation and timing.

Habit 1: Be Proactive
Being proactive is more than taking initiative, it is accepting responsibility for our own behavior (past, present, and future) and making choices based on principles and values rather than on moods or circumstances...

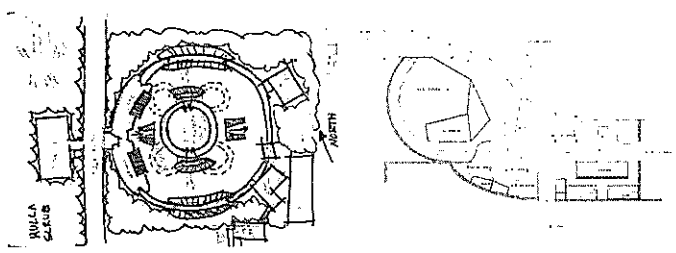
Two groups showed quite a different approach to the design process during first week. Group X had great difficulty in developing a common vision. Their personal distastes and conflicts affected the group formation resulting in all members working as either individuals or teams composed of 2 members only. Some members blamed each other for failures and some members choose to become 'victims' with declarations such as *"they don't like me, they don't accept me..."*; although, their choices appeared to be based on their moods. However, most journals revealed that they later on individually became aware of the situation and decided to compromise, and to try to finding a mid way for successfully completing the task. Group Y, on the other hand, showed more cohesive from day one; respecting each others' ideas and mostly enjoying working together. There were heated arguments at times but the approach was mainly constructive rather than being self invested or a power play.

Habit 2: Begin with the End in Mind
Individuals, families, teams, and organizations shape their own future by creating a mental vision and purpose for any project...

Many students were novice designers, being at their second or third year of a 3 to 6 years long education. This inexperience resulted in difficulty to begin the design with a goal or end in mind. Lack of a common vision caused some members to get lost in details (their comfort zone) rather than trying to create an evocative, atmospheric or stimulating outcome appropriate to the special and "unique" situation of the particular project and place.

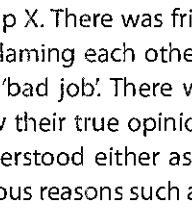
Habit 3: Put First Things First
...organizing and executing around the mental creation (your purpose, vision, values, and most important priorities)...

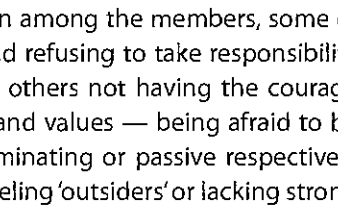
Although stimulated and engaged by the opportunity, both groups showed evidence of being somewhat overwhelmed by the scope of a real project and consolidating a brief. They failed to prioritise tasks and design criteria to address this situation, and at times became lost in premature detail or presentation tasks (Figure 2).



a) initial fluidity and delicacy captured by freehand exploration

b) constraint and rigidity emerge with drafting package





c) compromised design of qualities— materiality, physicality and detail

d) mood and atmosphere design represented with pastels

Figure 2. Examples of how student design development process is influenced by the medium of communication.

Habit 4: Think Win-Win

Thinking win-win is a frame of mind and heart that seeks mutual benefit and is based on joint respect in all interactions...

Most members of the groups supported each other and worked together providing input from their disciplinary background. However, one member was noted as dragging his/her group down trying to be the star of the group; *"There is one person in the group who is really negative and this person is putting both the group and design down all the time".*

Habit 5: Seek First to Understand, Then to Be Understood

When we listen with the intent to understand others, rather than with the intent to reply, we begin true communication and relationship building...

During the earlier stage there was no coherence in the work of Group X. There was friction among the members, some of them blaming each other and refusing to take responsibility for the 'bad job'. There were others not having the courage to show their true opinions and values — being afraid to be misunderstood either as dominating or passive respectively for various reasons such as feeling 'outsiders' or lacking strong views. At a later stage, once they realized that they were in a spiraling downfall a group member took the lead of the group to uplift the situation; this person chose to be "leading as a manager" and sharing the tasks rather than "leading the design". However, this action helped the other members to lower their defenses and join the process successfully.

Habit 6: Synergize

...Synergistic teams and families thrive on individual strengths so that the whole becomes greater than the sum of the parts...

Initially group members tended to play roles they defined through their perceptions of their discipline. Engineers offered no more than structural opinions, interior designers waited for an interior space to be provided, etc. As individuals became more comfortable in their groups this gave way to freedom to comment on all aspects of the design thereby behaving more transdisciplinarily. This allowed the groups to benefit from a wider range of ideas and opinions.

Habit 7: Sharpen the Saw

Sharpening the saw is about constantly renewing ourselves in the four basic areas of life: physical, social/emotional, mental, and spiritual. It's the Habit that increases our capacity to live all other habits of effectiveness...

The very intensive work that went on from early morning to late evenings for six days a week is quite an exhausting and nerve wrecking process including the organization of social events. However, organization of barbeque parties, celebrating birthdays, soccer matches, visiting an Australian homestead, as well as students preparing a documentary film about the "Charleville experience" were all bonding and energy generating activities.

In summary, it is evident that all seven habits were present to varying degrees. However, there was a difference between the two 'groups' personalities' due to the individuals involved and to the group dynamics. Covey's (1999) categorisation, while enabling insights into the behaviour of the individuals and the groups, does not address how the students' conceived designing in its own right. This aspect will be addressed in the following analysis.

Franz's Approach and Outcomes:

In her phenomenographic study of design, Franz's concern was 'elucidating ways of categorising how the designers approached the task and what they understood of the material related to the task' (Franz 1997, p.12). It was found that designers understand (or experience) design in at least four different ways:

experientially; structurally; in production; or in retail terms. She defines these conceptions from an approach and outcome points of view, where **approach** refers to the organization and management of a design situation; and **outcome** represents the understanding of the situation, its constituents and their relationship to each other. Before applying these to our study, the four conceptions of designing will be discussed briefly.

Experiential Conception: Design is seen as the development of an interpretative framework for facilitating interaction involving people and environments. **Approach** is holistic; motivated by the desire to deeply understand and contribute to the situation intrinsically (characterised by an attempt to find, develop or preserve the relationship of some *thing* to a greater whole). **Outcome** is dynamically hierarchical and appreciation of the situation is sophisticated in an extreme way.

Structural Conception: Design is seen as the generation of an environment for supporting interaction within that environment. **Approach** is discriminatory; characterised by a strategic frame-of-reference. **Outcome** is statistically hierarchical and appreciation of the situation is sophisticated in a limited way.

Production Conception: Design is seen as the production of an object for accommodating specific functions. **Approach** is mechanistic characterised by a focus on what is given (the physical parts or components and their particular function within it. Situations are understood to be comprised of disparate elements, each contributing singularly to the meaning of the whole). **Outcome** is atomistic (resulting in collections of various isolated components) and appreciation of the situation is defined as literal.

Retail Conception: Design is seen as the supply of an object for accommodating specific functions. **Approach** is commercial, characterised by a focus on what is available; whereas, **outcome** is atomistic and appreciation of the situation is literal and limited to design as business.

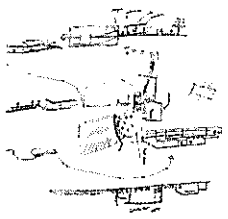
From the observations of the groups certain conclusions can be drawn. Both groups began the design process with what appeared to be a **Structural Conception**; that is, a process characterized by an understanding of design as the generation of an environment for supporting interaction within that environment that is sympathetic with the designers' goals, the client's goals, and general community attitudes. The approach is guided by the rationalistic belief that the complexity of design situations can be managed by reducing then to a state in which their structure becomes evident. In this conception design commences with designers meeting the client to establish the design to be generated. Then, designers search for examples that are similar to the project, gather information, synthesize and suit to their own philosophy.

During the workshop and at its completion, there were some variations in the approaches of the two groups and some fluctuations within each group. Group X's difficulties with group dynamics led them to slow down, if not come to a halt, and work separately whereas Group Y continued to demonstrate the characteristics of a structural conception for a good part of the first week. This group then shifted towards **Experiential Conception** attributes. Butter paper sketches revealed that development of the project at this stage was more complete as this group was dealing with the design and relationships as a whole. Graphic "conversation" shows an interactive group approach and strategies to attempt to deal with a complexity of issues (Fig. 3.a). For example, an exploration from 2D to 3D (Fig.3.b), trying to link the disparate aspects (Fig.3.c), exploration of various options, and experimental evaluation are evident.

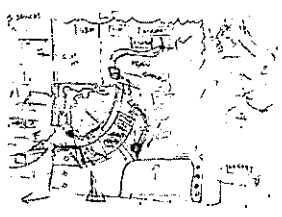
For Group Y, another stage followed where there was a loss of feeling or inspiration, indicating a lack of ideas is evident. There appeared to be aspects of both **Production and Retail Conceptions** in combination. A rational "logic" is evident which restricted the design rather than responding to or leading design options. The translation of options generated through freehand engagement to computer aided representation also seems to have constrained the inspired or freer investigations. There is evident many examples of tunnel vision, focus on the parts at the expense of the whole, the use of non exploratory "known" situations or stock-standard answers (Fig.3.d). An ability to bring the previously evident brainstorming process, and to apply the explorative skills, to the "real" design was minimal. The group did bring substantial knowledge to the design, but this could not be developed to its potential due to lack of depth of exploration. This could be the result of students returning back to their comfort zone due to time constraints rather than applying their new found skills and awareness.

However, although the process demonstrated one or two conceptions, there were also aspects of innovation in the area of environmental sustainable design and its application (Fig.3.e).

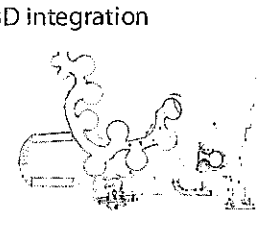
The other group demonstrated directly attributes of the **Production Conception**, characterized by a focus on the physical parts or components and their particular function with it. It was comprised of disparate elements, each contributing singularly to the meaning of the whole; a collection of various isolated components. Their work on butter paper can be described as: "risk" versus repetition and fine tuning, "stagnating" balance process, fine adjustment rather than refining, working with the information and or idea but not resolving, describing as objects rather than working through, "dead end" reflection, emotionally "tight" process, and creatively "tunneled". Once the group dynamic was restored after the spiraling downfall the group converted to **Structural Conception** and put the pieces together toward a resolution.



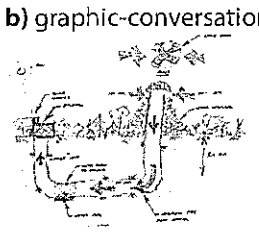
a) 2D:3D integration



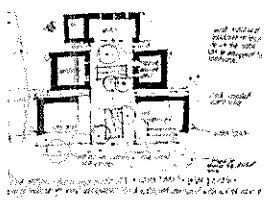
b) graphic-conversation



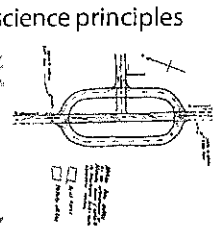
c) student and tutor discussions



d) exploration of architectural science principles



e) integration of interior, site and ESD design options



f) trying safe and predictable solutions

Figure 3. Examples of student idea development.

IN CONCLUSION: THE EXPERIENCE

Although it was evident that the process of the intensive workshop revealed attributes of the four conceptions of design identified by Franz, by combining the data from the student reflections and our photographic record, the students did also, to varying degrees, adopt an Experiential Conception. In some cases this was indicated in the initial reflections while in others it became evident as they began to develop self awareness. The development of the initial design conception is hypothesised to be influenced by the speed, degree, and nature of the personal and professional transformation.

As stated previously, design is seen within the experiential conception as the development of an interpretative framework for facilitating interaction involving people and environments, the approach is holistic; motivated by the desire to deeply understand and contribute to the situation intrinsically (characterised by an attempt to find, develop or preserve the relationship of some thing to a greater whole), such that, the outcome is dynamically hierarchical and appreciation of the situation is sophisticated in an extreme way. The students (or designers) therefore come to see design as being beyond just the project and themselves as a producer of a design.

The quotations from the diaries and our observations demonstrate an experience which is captured by X7's quote. The reflections clearly demonstrate the interdependency between the self, the group, the design process, societal and personal values, and a transformation of understanding and in approach:

(by DAY7)
I have no idea what I and my group are doing. It feels as though we are walking so far backwards that we are not getting anywhere. I used to say "I'm excited" now I have changed my mind. I hate it here....

(but by DAY14)
I miss the intense brainstorming sessions and biting my tongue. The Charleville experience was amazing ...an opportunity to reflect on the important things in life and not just the superficial attributes life offers.

Within this paper we have sought to explore the nature of design through the interrogation of a community based design project involving staff, students, consultants, and clients from breath of disciplines. Initially assumptions were made concerning three acknowledged aspects of student learning—interdisciplinary interaction, design methodology, and the engagement of adult learners. As a result, the current authors posited firstly, that the Charleville Educational Tourist Centre project provided a suitable learning experience that would be stimulating and meaningful for adult learners; secondly, that these students would have different understandings of the design process and its goal, and that these differences, and their advantages and disadvantages, would be revealed through the project; and thirdly, that some students may have difficulty in embracing the opportunities in integrating a transdisciplinary (or at least interdisciplinary) approach to design and that facilitation to break old habits may need to be orchestrated particularly when the situation was a real project for a client.

All three aspects were shown to be evident and important. Through the project reported, it has been demonstrated that a design project can provide a learning experience that is also transformative and dynamic in nature. The design process was shown to involve the conceptions of design of the individual, the discipline, and the multi-discipline group. In addition, the personality of the individuals and their ability to embrace ambiguity and develop self awareness, to identify and reflect upon the role of design in society, and the role of the designer in relation to the project were all shown to play part in how the design resolution was achieved.

The current project is of value because it not only indicates the value of such projects in fully engaging students in learning. It also amplifies a series of assumptions and modes of operating that are inherent in design practice. Importantly the project demonstrated how the individual, social, and professional dimensions of the interaction are embedded in how a design project is understood, undertaken, and resolved. There are, therefore, opportunities to capitalise on this knowledge to amplify the productive and successful aspects as well as to counteract the obstructive or inhibiting elements.

In our project, students showed a range of talents pertaining to procedural and professional engagement. What was able to shown to be limiting was a lack of deep substantive knowledge and technical skills across all disciplines and years, which stimulated a return to predictable or known concepts or resolutions. These deficits became explicit due to the intensity of the program and therefore were able to be addressed to some degree. By ensuring that such aspects are addressed proactively in similar situations in the future, it is posited that the level of resolution could and would be higher. Further research into these characteristics and conceptions will assist in our understanding of designing, design methodology, and design education in both traditional studios and intensive educational environments.

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DESIGN INTENSIVE BORN GLOBAL COMPANIES IN FINLAND: CHALLENGES OF THE DESIGNER AS ENTREPRENEUR

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Abstract

This paper investigates design intensive companies that are "born global" in that they have internationalized their business in a very short period after their establishment. The focus in this paper is on the mentality of the entrepreneurial designer, in particular in terms of the marketing, business, and internationalization of the design intensive company. The paper finds that partnership of design entrepreneurs with marketing and other business professionals is a source of sustained competitive advantage. There is also a need to build a new type of design business model and marketing strategy that will support the unique characteristics of design business.

Introduction

Young, small sized, companies with global sales potential are often referred to as "Born Globals" (BGs). The study explores the characteristics of Finnish design intensive companies that internationalize their business in a very short period after their establishment. All of the design intensive BGs studied in this research were established by at least one entrepreneur with design background. Thus, in addition to the commonalities of the case companies, the paper also specifies the kinds of influence that entrepreneurial designers exert in the process of fast internationalization of their companies.

Born Global Companies

According to one definition, Born Global companies have over 20% of their sales outside their home continent and over 80% of their sales outside their home market within 10 years of their establishment. These very young but rapidly internationalizing companies are becoming more and more common in the respective economies. According to Rennie (1993), 20% of the new trade growing in Australia in the early 1990s comes from born global SMEs.

BGs are seen as much more important phenomena for small and open economy countries (SMOPECs), than for large economies. This is because in SMOPECs, the domestic push factors (openness, smallness and location) have been the most dominant factors behind the companies' decisions to start globalization (Luostarinen 1994). Moreover, the large size of foreign target markets increases the pull forces by creating a strong macro power field for the development of BGs (Luostarinen and Gabrielsson 2004). Countries such as Sweden, with 8 million inhabitants, and Finland, with only 5 million, are good examples of SMOPECs. Due to its small domestic market, fast and quick internationalization is the way to survive for many companies.

Global enabling factors for BGs

In the last decades, there have been major changes in the world that made it possible to establish a global venture from the outset which can compete successfully in international markets despite its limited resources. Many developments are global enablers that create the suitable environment for the BGs' survival and growth. These enablers and forces include (Luostarinen R., Gabrielsson M 2004).

- Recent technological innovations in low-cost communication and transportation (Internet, transportation etc.)
- Expansion of the international marketplace

(emergence of global competition and integration of large trading blocks)
- Change in consumer demands (need for more specialized and customized products in a faster time)
- Increasing homogenization of many markets in distant countries (unification and globalization of consumer tastes)
- De-regulations, lifting of trade barriers
- Increase in the numbers of business executives and entrepreneurs with international experience
- Easier access to financing

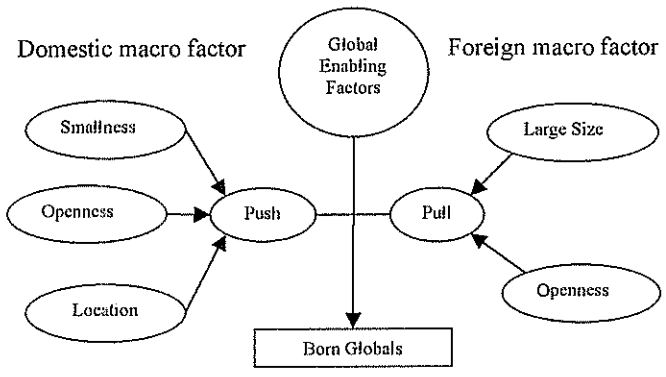


Figure 1. Factors influencing the existence of BGs in SMOPECs

Main characteristics of BGs

BGs are usually small sized and young companies. This characteristic gives them flexibility and allows them to internationalize faster, however it may as well cause financial challenges and dependency. Targeting niche markets is another common characteristic of BGs. Rapid changes in consumer demands cause the need for customized products, which create the need for niche markets. BGs exploit it to their advantage that larger companies are not able to adapt and adjust as fast as needed according to changing demands of the international markets (Madsen and Servais 1997).

Successful BGs benefit a lot from focusing on niche products. Niche strategy with very innovative and dynamic products seems to be the best way for these companies to compete against well-established global companies. Small BGs shield themselves from competition. However, when the established competitors become aware of the growing potential in that particular sector, the owners of the SMEs may be tempted to sell the business (Kirpalani & Luostarinen 1999, 11).

Physical distance is naturally not a negative factor for BGs; they tend to rely on international networks and cooperation, while outsourcing non-core competencies. Due to their size and very limited resource pool these companies seek to strengthen their competitiveness by networking with other companies through strategic alliances or joint ventures.

Another characteristic of Born Global companies is lack of fixed routines and willingness to adapt their internationalization strategy to the needs of the market (Moen 2002). The entrepreneurs of BGs usually have a global mindset and vision from the outset. They belong to cosmopolitan and transnational social networks of like-minded individuals. The individuals in the network typically engage in brokering where they provide each other with what is well known in their local context and exchange it at a premium to some else for whom that something is new and commercially valuable (Hargadon and Sutton 1997).

Born globals in design industry

One of the main success factors of BGs is the innovative, unique product ideally suited for marketing on niche markets (Bloch, 1995). Innovative design is accepted as a crucial way to sustain functional, aesthetic and strategic differentiation (Sisodia 1992, 34). Kotler and Rath (1984, 17) mention that design can also create corporate distinctiveness, to make a new product stand out from its competitors.

There are several examples of companies that have experienced rapid internationalization through using design as their single core competence and their strategic recourse to gain competitive advantage (e.g. Aav, 2003; Ainamo, 2005). This study focuses on those design-intensive companies that produce consumer goods with non-or very little technical functions within the actual products. While also some high-technology can take on logics of a design industry (Djelic and Ainamo, 2005), the final purchase decision in a design industry is believed that many products are without a shadow of doubt acquired as "cultural goods" (Hirsch, 1972; Djelic and Ainamo, 1999); that is, purchase decisions about them are

dominated by the impact of the aesthetic appearance, not by the impacts of the technical features. Some of the traditional design industries that belong to the design industry in this way are: Textiles, fashion, accessories, architecture, furniture and interior decoration products, kitchenware, and jewellery.

There are several factors why design industry enables young companies to become Born Globals:

- **Open competition:** Design is one of the most openly competed sectors. While the education of professionals may be subsidized by various national governments to make the local producers more competitive, companies as a formal national policy, at least in Finland, get no direct subsidies. Products are competitive by virtue of product differentiation and/or media exposure.

- **Niche customer segments:** Design is ideally suited to target the products to the specific preferences of the selected customer segment. This characteristic of design sector fits perfectly with the definition that BGs have niche market strategies.

- **Small volumes:** Design intensive BGs deal with relatively small volumes of their specific niche. Exclusivity goes hand in hand with a premium sales price, which not only makes the small volumes feasible but also keeps the company from growing and ceasing to fit the BG category.

- **Price advantage:** Well-designed product adds to the perceived value of the product. And it is proven that customers are willing to pay more for a product if they consider it to be of a high quality. (Trueman and Jobber 1998)) Design is one strategy by which to deal with price competition coming from less developed countries (Schneider 1989).

On the other hand, there are also several challenges for young companies in design industry in terms of process of globalization:

- **Global design taste:** For design intensive Born Globals, there is a need for emergence of a universal consumer segment and the capturing of demand in that segment. This is often question of how similar are design tastes across geographical and other bases for segmenting (Cooper and Press 1995, 123). Differences in national culture are most visible in a non-technology sector of the industry, such as design-intensive businesses. Within this context, it is a challenge to design and produce products, which fit a niche and are acceptable globally. The perceptual and emotional power of design of the products is more and more important in design intensive BGs (Schneider, 1989).

- **Intellectual property rights:** Being copied is always a threat for design companies, especially for small sized companies. Patent legislation is insufficient today to protect the rights of design companies. However, unique design is a powerful tool to create a strong brand. Branding is one of the most efficient ways to protect against imitation. It guarantees the long-term competitive advantage, since it makes copying harder.

- **Designer as entrepreneur:** In the early stages of their operation, the entrepreneur designers often manage design companies. This might lead to lack of international management know-how in many cases. Understanding business aspect of design, along with knowledge of foreign markets are among the weakest dimensions of designer competencies in Finland (Korvenmaa 1998, 41). Designers have been entrepreneurs who focus on exploration capture of new ideas but tend to weak in terms of market launch and commercial exploitation of their ideas. Globalization process requires the business knowledge of experienced experts in (international) management and marketing.

Method

A qualitative research approach is chosen for this study since the area is rather new and it is so hard to find related research or applicable data found on the internationalization of design intensive companies (Eisenhardt, 1989). A multiple-case study approach is preferred over single-case because the aim was to gather an overall understanding of the behaviour of internationalizing design companies rather than obtaining

a deep knowledge about one design company's actions (Eisenhardt, 1989). Semi-structured interviews are chosen as the most suitable method. These types of interviews are similar to guided conversations rather than structured queries. Semi-structured interviews provide the freedom and flexibility during each interview but still keep the focus on the relevant central issues of the research problem (Yin, 2003).

In order to find case companies, the list of Design Forum including 80 companies operating in the Finnish design industry were scanned. The objective was to identify the potential born global design companies in the list, which are young and small-sized, though exporting and design-manufacturing companies. After several elimination steps following six companies are selected as cases and interviews are conducted with the entrepreneurs of each company.

Six cases of design intensive born global company

1. IVANA Helsinki, http://www.ivanahelsinki.com
Founded: In 1998
Entrepreneurs: Paola Suhonen (MA in design),
Pirjo Suhonen (M.Sc. in marketing)
Industry: Fashion and textiles
Turnover: 1.1 Million Euros (15 000 - 20 000 products/year)
Export: 80% of the sales (from this, 70% to EU countries,
30% Hong Kong, Japan, Singapore, Korea)
Retailers: Belgium, Denmark, France, Germany, Greece, Hong Kong, Italy, Iceland, Ireland, Japan, Netherlands, Norway, Singapore, South Korea, Sweden, Switzerland, UK, USA, Canada
Characteristic: Home made, soulful design, hand made prints and details

Ivana Helsinki is a family-run fashion company. Paola Suhonen is the designer of the company whereas her sister, Pirjo Suhonen, is responsible for marketing and customer relations. Since the beginning the label has grown steadily, with full-scale collections produced in Spring/Summer, and international distribution throughout Western Europe, North America, and Asia. The IVANA Helsinki factory is located in Helsinki, Finland. It is a small company with 14 employees: Four in management, three in retail and the rest in production.



Figure 2. http://www.hannasaren.com

2. Hanna Sarén, http://www.hannasaren.com
Founded: In 2000
Entrepreneurs: Hanna Sarén (M.A in design),
Jussi Tiilikka-Managing director (M. Sc. Econ)
Industry: Fashion and textiles
Turnover: 200 000 €
Export: 90%
Retailers: Products are sold in 20 countries (USA, Japan, Italy, England, France, etc.) – in over 100 boutiques.
Characteristics: The HannaSarén brand is based on ready-to-wear clothes, handmade wooden shoes and handbags. Designer Hanna Sarén and her husband Jussi Tiilikka, Managing Director (M. Sc. Econ), started their family business in January 2000. They operate in downtown Helsinki, Finland.



Figure 3. http://www.tonfisk-design.fi/

3.Tonfisk Design, http://www.tonfisk-design.fi/
Founded: In 1999
Entrepreneurs: Brian Keaney (M.A. in design),
Tony Alfström (M.A. in design)
Industry: Ceramics, kitchenware
Turnover: 300 000 € (20 000 – 30 000 products/year, design consulting 40%)
Export: 27% Finland, 31% EU + Scandinavia, 42% other
Retailers: In 30 countries; such as USA, Japan, UK, Denmark
Characteristics: Contemporary tableware and luxury gifts. Tonfisk is a creative, luxury Finnish design brand specializing in handmade gifts of drinking and serving products. Tonfisk presents

innovative and unusual solutions in functional and contemporary tableware for the well set table. The collection includes gourmet tea sets, espresso cups, fruit dishes, serving plates, salt and pepper shakers, lemon squeezers and milk and sugar sets.



Figure 4. Antti Eklund
http://www.animaldesign.fi

4. Animal Oy, http://www.animaldesign.fi/
(Later became Leolonglife)
Founded: In 1997 (sold in 2004)
Entrepreneurs: Antti Eklund (M.A. in design),
Jouni Ikonen (M.Sc, in engineering)
Industry: Plastic household products
Characteristic: Animal Design Oy is a utensil and interior design products manufacturer and wholesaler, which co-ordinates the design, production, marketing and sales of ANIMAL® products. The company's goal is to build up the strong and internationally acclaimed ANIMAL® brand.

5. Snowcrash, http://www.snowcrash.se (closed down)
Founded: In 1997 (Snowcrash's operation closed down in 2004)
Entrepreneurs: Ilkka Terho (M.A. in design), Ilkka Suppanen (M.A. in design), Teppo Asikainen (M.A. in design), Timo Salli (M.A. in design)
Industry: Furniture
Characteristic: The only example with Venture Capital funding. Parent company Proventus faced the risks in acquisition of creative companies.

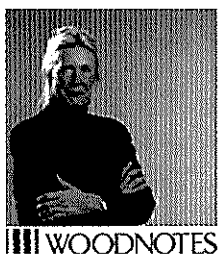


Figure 5: Ritva Puotila
http://www.woodnotes.fi/

6. Woodnotes, http://www.woodnotes.fi/
Founded: In 1987
Entrepreneurs: Ritva Puotila (M.A. in design),
Mikko Puotila (M. Sc. Econ.)
Industry: Paper yarn carpets and interior textiles
Turnover: 3.300.000 €
Export: Around 75% of its output to about 50 countries.
Retailers: Biggest export countries: Germany, then Denmark, then Spain and Japan
Characteristic: Largest design intensive BG case that managed to grow in the last 20 years.

Commonalties across the six cases

Next, we focus on characteristics of the five case companies in more detail in terms of what has enabled these companies to compete globally against larger established players in very early stages after their establishment.

All six companies have unique product ideas and design as key success factors. Each company has used internal designers as the core design source. Registration of intellectual property rights concerning design has not been a key part of their design and marketing strategies. Rather, they have quickly moved to develop a strong brand identity and have continuously regenerated new product ideas to create and sustain their marketing and competitive advantage.

Sufficient scale for production has been also an important success factor in all of the companies. Where production has not been internalized, these companies have created a cooperative network and utilized external resources in manufacturing and/or distribution so that they have been able to globalize despite their limited resources.

The entrepreneurs running these companies have not been content to have unique product ideas, but communicate these ideas to potential customers, to distribution channels, and the media. Because of the severe financial restrictions, advertising has not been a primary channel of marketing communications. Instead, these companies have participated in various international design fairs. Here, they have been able to benefit from government subsidies for design promotion. The resulting publicity has been crucial to the companies'

internationalization process in each case. In this way, the small companies have been able raise the public interest in their products, and to access important business contacts and international distribution channels both at home and abroad.

Enabler-analysis of the five cases

All the case companies share general BG characteristics at the macro-level, micro-level, and the milli-micro-level.

1) Mocro level factors: Design industry and design market related characteristics

• **Global design authorities:** In the world of design, there are parties who decide what is "good design" is. These are global design authorities, in other words, the "taste elite". These are people who choose designs for museums, people in the juries of competitions, professors in the universities, people working in design organizations or writing for trendsetter design magazines and consultants that are respected worldwide by the design community. Their judgements and opinions are followed and their references are valued by most of the designers and design related communities. The "taste elite" creates the first customer segment for design companies to acquire approval and visibility. Most design companies including the case companies place a strong effort on reaching these parties and communicating their design values. (*Form Function Finland*, 1996).

• **Global trend seekers:** In the design industry, one way for an upstart design entrepreneur to be successful has been to be a trendsetter. Recent technological innovations in low-cost communication and transportation have enabled a group of people travelling around the world and looking for unique products and new brands. These global trend seekers carry different design ideas to the suitable markets where the products can reach the top customer segment. Global trend seekers create opportunities for young companies such as Hanna Sarén to suddenly establish global contacts while they are in their own local market. The demand coming from open distant markets pulls small design firms to produce a larger amount of their designs for global customers.

• **Local market challenge for the start-up:** For each of the five companies that we analyzed, establishing a brand name in at least one market has been extremely important to gain visibility and approval in the retail market. Most of the start-up companies have had difficulties in their local markets despite their good products. This has been both because of limited market volume in their home market and because of what they considered limited financial resources for expansion of their business. This local market challenge has created a push factor for small design companies to go abroad and prove themselves first in the international arena and then come back to their local markets.

> "We went directly to exporting, because you need more time in Finland. After establishing a company, you have to make improvements. The shops here follow other "trendsetter" shops, and buy the products the others are selling. In the international market it is different. These shops know what they can sell already by seeing the product. Therefore we had more chance with them in the beginning." Brian Keaney / Tonfisk Design

In global markets, to the contrary, their unknown brands has not been a disadvantage as long as the products were unique. This has been because the judges of "good design" (see section above on "global design authories") are always on the look for new up-starts that they can reward with awards, and thus to maintain their own superior habitus as authorities of the field.

• **National design support:** Gaining global visibility through design has been a national strategy for Finland. Most case companies received some sort of support from national organizations such as Tekes or from design organizations in order to participate in international exhibitions and to become known in the global markets, and to promote design in Finnish industry and society.

• **Financial uncertainty:** The 'luxury' or premium-price aspect of the design industry has made the business very fragile in terms of fluctuations in economic trends. The products of the six case companies that we have analyzed are among the first expenses that some customer will cut in an economic slowdown. This uncertain nature of the industry creates a great challenge for managers, since it makes the whole business unreliable and unpredictable, especially for young and small design intensive BGs.

2) Micro level factors: Company related characteristics

▪ **Design is the nucleus of business:** Designing products has been the reason that all of the design entrepreneurs in our data gave about why to set up their companies. In each and every case, the product designs have already existed prior to the companies were established. In these design intensive BGs, business has followed the product concepts and serves the need. Design has been the driving force of the whole business and creativity is the base for growth. This characteristic has appeared different from technology or market –led companies where design is used as a value creation tool.

• **Complementary relationship:** Some of the world's best design brands, such as Alessi or Armani, are the result of mutual partnership and combined expertise of a very good designer and a very good business mind. Three of the case companies (Woodnotes, IVANA Helsinki and Hanna Sarén) are also built of similar partnership presenting complementary backgrounds that have been a great advantage. Demarcation of the roles is also easier within the design intensive BGs, if there are at least two entrepreneurs from different backgrounds. In this case, the designer has not needed to be involved *"too much"* with the business decisions. In two other cases (Tonfisk, Snowcrash), the top management team has consisted of designer entrepreneurs only, and the team has lacked absorptive capacity to source in external business support. In addition, all of the designer entrepreneurs in our data have learned business management by doing. In fact, all complained that they do not have time for design any more. All mentioned the need for complementary business skills in the core of the company as an important matter.

3) Milli-micro level factors: Designer entrepreneur related characteristics

▪ **Start-up motivations for designers:** According to the empirical study, design entrepreneurs have several reasons and motivations for starting up their business which seem to differ then from business entrepreneurs. It is reasonable to expect that these different motives of the entrepreneur might influence the strategy and the business approach. In all of the six cases designer entrepreneurs knew what they wanted to do from the beginning. They already had an idea or a collection. However, new business graduates seek opportunities. The business partner sees potential and decides to cooperate with the designer. Here is the list of the most mentioned reasons by the design entrepreneurs for why they start up their company as what we call a design intensive BG:

1) Freedom (Animal Design, Ivana Helsinki, Tonfisk, Woodnotes and Snowcrash): Many designers have mentioned independence as a reason to start up own business. In most of the cases, the designers did not want to give away a good idea. They tried to find ways to produce and market a design idea and generate continuous production. These designers believed they would be much more flexible if they own the business: *"I can do what I want"*.

2) Family influence (Ivana Helsinki) Entrepreneurial families have an impact on the decision of entrepreneurial designer. Previous experience in retail and production creates a base for the new business and also gives confidence to young entrepreneurs.

3) No job (Snowcrash, Tonfisk, Woodnotes): Finding a job has always been a problem for new graduate students. However, in the design field finding a job that will satisfy creative needs is an extra challenge. The design industry is globally driven by a few large brands (see, for example, Djelic and Ainamo, 1999, for fashion), and there is not a huge selection of work positions for young designers. This fact had a major affect on the decisions of many entrepreneurial designers. There is a common hope that producing one's own design products can provide the ultimate creative freedom and space for designers.

4) Power of coincidence - First customer influence (Hanna Sarén, Animal Design). All interviewees mentioned *"chance"* as a factor. Being in the right place at the right time and daring to take risks were major factors in success. In most of the cases, the first order came by coincidence, without any previous planning. This coincidence created an opportunity and the need for starting up a company.

• **Global approach of designer:** Following international design publicity and participating in international design exhibitions are a natural part of the design education today. Most people in design communities follow the trends and opinions of the global design authorities, as previously mentioned. Gaining international visibility and fame is the dream of many young designers. Therefore global awareness is very commonly built in the designers' mind. Entrepreneurial designers use this global awareness in their business and lose no time to move in global markets where their products are valued. All the case companies started their business by joining international fairs and exhibitions. All the entrepreneurial designers believed they were already familiar with the global design scene: they knew very well how to gain visibility and access publicity due to their background from a leading European institution of design education.

• **Different priorities:** In an interesting twist to the modern marketing paradim (Kotler, 1988), a unique approach of all the entrepreneurial designers is that they have given a higher priority to the product over revenue from customers. None of the case companies said that business growth is their major focus. All of them mentioned the quality and the concept of the products as their highest concern. The entrepreneurs voiced emotional attachment to the designed products and the individual passion as the major strengths of their company. The strong sense of identity leads to creating a strong brand. This is a different approach from economic/business driven companies. In the case companies, business is the tool for the survival of the design products whereas in the traditional cases, design is the tool for the survival of the business.

• **Non-monitory values** are very important for designers. Trust in intuition has been one of the main values designers have inside or learn during their education. They appreciate skill and beauty. To them "good design" has not been related to market sales but to the senses. This might create a conflict between design and business partners within design companies, such as on the decision of a product collection. In designer led firms, decisions may be affected by these non-monetary values. If the designer entrepreneur has a close relationship to the business entrepreneur, such as Ivana Helsinki or Woodnotes cases, these non-monetary values are better understood, highly appreciated and easily involved in the business decisions, which creates a unique advantage for the company.

Discussion

Based on the previously discussed characteristics of the design intensive companies, certain challenges are identified for entrepreneurial designers.

Challenge 1: How to discover and maintoin marketing approaches and business models oppropriate for supporting innovative design? There is a need for a new type of design business model that will support the unique characteristics of design intensive companies.

In most of the case companies, innovative design products were managed in a very traditional business structure. The innovative approach of designers that creates the competitive edge of the companies was hardly seen in the business or distribution strategies.

According to Ilkka Suppanen fro Snowcrash one of the main problems within the design world lies in the distribution network. Where to sell is a huge problem for design intensive companies. On the other hand, a combination of short delivery times and feasible transportation costs is seen to be a very important competitive factor. The efficiency of logistics is of utmost importance especially in the furniture business in which the products are bulky by nature.

> "Today, the order of a sofa from Italy to Finland takes 8 weeks. The customer has to wait since the designed product comes from Italy. And sometimes when the customer receives it, there might be a scratch on it. What will she do? - She sends it back. The design company gets into trouble because transportation is half of the cost. When they send the same product two times, they lose all their margins and make losses. The customer is not happy, because she receives her sofa 16 weeks later. The producer company is not happy since it does not make money."

This example illustrates another challenge for the entrepreneurial designer that requires professional expertise from business area. Mutual partnership of design and business backgrounds has a great opportunity of building original business structure and strategies for the company that derives

from the unique characteristics of design business. In order to create a competitive and long-lasting design business, there has to be a balance of both design and business expertise. This conclusion can be based on the remarkable global expansion of Woodnotes and Iivana Helsinki.

Challenge 2: How to grow? The skills to start up a design intensive BG are different from those, needed to expand the company into a large global organization.

A great challenge for the entrepreneurial designers is managing the growth of the design company. As mentioned before fast growth is an opportunity and, at the same time, a large risk for design intensive BGs. It is almost impossible to manage the company within the same team during the process.

The cases showed that there is very strong contribution of a designer's vision and background in the start-up phase of a company. To some extent this can help in the initial brand building and start-up of the marketing activities. On the other hand how to grow is a strategic decision which should be planned carefully. A designer background may not be sufficient to see and react to opportunities and risks in the long run. The entrepreneurial designer has the option to seek externally professional management skills for the company. However like in every entrepreneur situation, to share the power and the responsibilities is a problem. "The boss" may not want to hire someone to take the decisions. On the other hand, a partner with business understanding may be an appropriate option.

Challenge 3: To sell design service or to sell design products? The first challenge of an entrepreneurial designer is the decision of how to structure the design business.

There are several options for a designer. The first option is to work as a freelance designer and to sell design services (e.g. Harri Koskinen). In this case it is vital to grow one's own name as a brand and gain visibility in the media and design communities. Most of the time, companies choose to work with a designer considering the marketing value added by the name of the designer.

A second option of the entrepreneurial designer is to start-up a design consultancy and to offer design services under the company brand (e.g. ED Design). Design consultancies have different functions from star designers since they have a larger resource pool and may offer a wider range of services. This time the designer's name or personal appearance is less significant. In both of these cases, the designer can work either on a specific design brief where the final design product belongs completely to the client, or the designer can create his/her own design works and look for a manufacturer to produce and market the design for a certain period. In this case, the designer receives a certain percentage of the sales from the licensee.

The third option of a designer is to sell designed products that are produced and branded by the designer. Here, there may not be a need to build up a large marketing and business organization and highly developed adminstrative structure. "Production can mean production that has been internalized with the company or it can mean something akin to 'production' in movie making in many makers, where latent networks are activated on a project basis. Also in some other industries, such as luxury fashion industry or in mobile telephony, networking are outsourcing are standard routines.

Additional challenges appear such as managing manufacturing, building distribution channels and most importantly handling the sales. These would be most probably the weakest areas of a designer due to her background and it is vital to get support and additional knowledge in the organization. However, despite all the challenges, this last option offers the largest financial opportunity of the design business.

Ilkka Suppanen of Snowcrash, is a designer who experienced all these options. He explains his opinion regarding the advantages and disadvantages of these alternatives:

> "In the short term, I think it can be a better option to go to self production, because that gives immediate turnover and immediate financial reaction to your work. You can keep running very fast. But in the long term, I personally think that it would be better as a designer selling only design service and receiving your income out of royalties or whatever. But in the short term that doesn't pay off much.

In the longer run of course, self production can be very interesting, rewarding. But, because of the way designers study one might say that a designer is not a business man. On the other hand when we think about the very famous large design companies all around the world we see that mainly designers are running the business, for example, Cappellini. These companies can grow very well and be very successful in the long term. However, again there is a roof they can go, since it is all based on one designer's view, based on one vision and creative direction of one person. You can't distribute that vision in the larger companies. Therefore, in the larger scale, design companies become a different story than the start-up phase".

In conclusion, the case studies confirmed that the design intensive BG's have several common characteristics that derives from the unique nature of design business. Based on the findings it can be told that entrepreneurial designers have mindsets and behaviours different from many other entrepreneurs and these may affect the ways that the designer-led companies are managed. There are three main challenges identified for designer entrepreneurs: finding an innovative business approach that will support the unique characteristics of design intensive companies, finding how to grow and to acquire the skills set to expand the company, as well as deciding whether one's core design competences is in services or in tangible products.

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http://www.snowcrash.se (closed down)

Appendix

Case Study Interviews
1. Snowcrash, Timo Salli 03.03.2003
2. Tonfisk Design, Brian Keaney 14.03.2003
3. Hanna Sarén, Jussi Tiilikka 23.02.2004
4. IVANA Helsinki, Pirjo Suhonen, 24.02.2004
5. WOODNOTES, Mikko Puotila, 02.03.2004
6. Tonfisk Design, Brian Keaney 04.03.2004
7. Snowcrash, Ilkka Terho 18.03.2004
8. Snowcrash, Ilkka Suppanen, 26.03.2004
9. Animal Oy, Antti Eklund 15.04.2004
10. IVANA Helsinki, Pirjo Suhonen 26.09.2005 (e-mail)
11. Animal Oy, Jouni Ikonen 01.03.2006 (phone call)

SUSTAINABLE DESIGN: A CRITIQUE OF THE CURRENT TRIPOLAR MODEL

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Abstract

By 'tripolar model', it is referred here to the model, often also called '3 P model: Profit/Planet/People' or '3 E model: Economics/Environment/Equity', which is very widely used as **the** reference model for any project in sustainability, which includes of course sustainable design. The purpose of the paper is to present a critique of this tripolar model as it is structured and used. The researched is based on the empirical evidence that too many projects which are based on this model have run into serious difficulties or have failed. The critique of the model is carried out in two steps. The first concludes to a lack of complex intelligence in the handling of the systemic logic of the model. The second one shows that the anthropological foundations of the model are fallacious. An inverted version of the model follows, with a renaming of the three poles: comprehensive economics, social equity, and human creativity. The new model is then discussed with regard to the so-called 'social threefolding' principles of philosopher Rudolf Steiner (1866-1925), which remind the three ideals of the French revolution. In this perspective, Fraternity should be associated with the economic pole, Equality with the social, and Liberty with the cultural/creative. This model is currently used throughout the world as a basis for various initiatives, at scales ranging from local enterprise to national political economy. The paper concludes with the proposal that the model seems fruitful for the conduct of sustainable design projects.

Keywords: sustainable design; 3E or 3P model; social threefolding; Rudolf Steiner

Biography

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1. The holy trinity

Last week, I was reading the quarterly newsletter of the alumni of an engineering school in France, where successful project case studies involving graduates of the school are regularly analysed and commented. The specific case I was reading dealt with a large European building management company, which aims to develop a more sustainable management process. 'A building can be considered environmentally sustainable if it performs efficiently on the economic, environmental, and social aspects' writes one of the company's excutive. The next day at lunch, I was browsing through the monthly newspaper published by the local regional administration (France is divided into 22 such

administrative regions), whose executive council just recently adopted the principles and methodology of Agenda 21 for its regional development. 'Sustainable development must integrate economic, environmental, and social aspects' says the Vice-President of the regional Environment and Sustainability Board. Is it necessary to give due reference to the above quotes in the footnotes? Not really, since anybody can indeed make the same incidental remarks. Not one day passes without us hearing at the radio, watching on TV or reading in a newspaper or magazine that the three 'aspects' of economics, environment, and society are the pillars of sustainable development.

What's wrong with that, may we ask? What's the point? Well, the point is not that sustainable development should indeed address 'economic, environmental, and social aspects', but the fact that this principle is spelled out like a gospel, a mantra; that it is used in various contexts (political, educational, social, agricultural, etc) with exactly the same formulation, with apparently little concern for what it actually -in the very Aristotelian sense- means in such and such specific context. As if this mere incantation were sufficient to make sure that the projects which will be conducted under such label will actually contribute to or yield a development (whose development?) which will be sustainable (for whom?)! As if the actors who will be involved in the corresponding projects, having been blessed by the holy word, knew from the start how to behave and properly manage their respective courses of action in a developmental and sustainable way!

What allows me to be so outrageously cynical is not a personal, irrepressible trait of character, but the empirical evidence of the difficulties, the obstacles, and even the failures which so many projects have met, despite the good will and noble intentions of their initiators and stakeholders. Here again, I must confess as above that my argument draws on our common and daily experience, rather than on specific cases reported in the literature. The difference, in this instance, is that the 'common experience' refers to that of the design and design research communities rather than, as was the case above, the enlarged civil community, a community to which design researchers all belong.

We members of the design community all know that the case studies literature in project management is not overabundant with examples of failure and mismanagement[1]. Success stories are much more popular in professional journals, and such is the case in design also. Nevertheless, we probably all know -from our teaching experience for instance- or at least intuitively feel -from our familiarity with the complexity of design projects- that carrying out a project along the lines of sustainable development is likely to meet with inextricable contradictions and difficulties. It is precisely the aim of this paper to make clearer this feeling and to try to find out why these difficulties arise.

2. Problem, purpose, method and structure of the paper

I admit my diagnosis is not entirely based on the kind of evidence one would expect and should require in a respectful scientific community as ours. The hypothesis is that such evidence would be easy to gather however. My starting point therefore is that the management of design projects along the tripolar model -economics, environment, society- of sustainable development is consistenly hitting on strong contradictions followed by practical powerlessness and inefficiency, if not total failure. Careful phenomenological observation of such design projects, both in educational and professional contexts, led me to the supposition that failures might not be due to the inadequate management of the projects[2], but rather to the inappropriateness of the theoretical and conceptual framework, i.e. of the tripolar model governing the projects carried out under the heading of sustainable development. My hypothenis is further strengthened by the 'holy trinity' phenomenon described above, i.e. by the apparent lost in content and substance this pivotal model ended up exhibiting in various situations. More precisely, the meaning given to the three poles of the model is so indeterminale and loose that all sorts of interpretation become possible. Whereas this is particularly true of the 'society' pole, it also affects the two other poles. The abstract character of the terminology makes it almost impossible to find a consensus on what exactly is meant by 'society', 'environment' or even 'economics'. And here I mean a consensus among experts, not only among 'common' citizens. The latter is a political, the former a scientific issue. It is as if the tripolar model, which was originally meant to **pragmatically** orient, guide and constraint action in a direction compatible with sustainable developement, had become a **rhetorical** artifice. The catchphrase has become evocative and convincing enough to justify any enterprise whose aims are

closer to political, economic, ecological, or personal ambitions than to sustainable developmental constraints.

Stated as it is, my hypothesis can be split into two questions or problems, along which the paper is structured. My first critique contends that the problems encountered in sustainable design projects may be due to an improper interpretation and implementation of the model (§3). My second critique is more radical in that it streams way up to the very model itself, considering it as faulty (§4). My purpose is to develop both alternatives, although I will dwell longer on the second argument. The first critique is carried out from a systemic/complexity theory perspective, whereas the second draws on economic- political- and anthropological- philosophical arguments. My conclusion (§7) is preceded by a critical discussion of the new model I propose (§5), followed by an epistemological parenthesis devoted to a brief metaphysical discussion of design thinking (§6)[3].

The method adopted for this phase of the research is clearly speculative or philosophical, if the latter implies an argumentation mainly based on critical analysis and deductive logic. The potential contribution of the paper is therefore to fundamental aspect of design knowledge. However, the conclusions of the paper must be considered only as a first step in a research, which is still in progress. As I have indeed claimed elsewhere, project-grounded research in design requires the field of a design project as its terrain where speculatively devised models must be put at work in order to be declared relevant and fruitful[5]. The opportunity to proceed to such 'situated-projectness' (pardon the neologism) is still pending in the course of my professional and research life. This is but one drawback of the method and its underlying phenomenological stance: It needs a long and rythmic temporality in order to unfold properly, i.e. to be epistemologically and methodologically... sustainable.

3. Systemic unsustainability

What I call 'tripolar model' is more often called '3P model' (profit/planet/people) or '3E model' (Economics/Environment/Equity). It is usually pictured in the shape of the familiar triangle we have all come across in the literature, academic and not. Its origin is well established: the basic concept emerged from the Brundtland Report (1987) and later crystallized at the Rio Conference (1992), together with the very concept of sustainable development and the 27 principles of Agenda 21[6].

According to this model, the three aspects of economics, environment (or ecology), and society are supposed to be addressed in any project which claims to be sustainable. More precisely, these poles are to be considered as goals or forces driving the model each according its own logic: the force of economics (to produce more for a larger number); the force of ecology (to respect the environment, to preserve nature and therefore the living conditions of future generations); the force of social equity (to fight poverty and distribute justly). The mutual compatibility of these three forces being far from evident or natural, some intervention is necessary in order to hold the triangle together. Their 'natural' tendency is indeed to mutually conflict. A closer analysis of the genealogy of the model has shown that it is the result of a 'cooperative negotiation' and that it may be understood as the outcome of a win-win world-wide game medialed by the UN[7]. The resulting consensus of the game was supposed to be a new emerging value, in which all stakeholders could then recognize themselves. What was at first a potential battlefield of a priori antagonist and conflictual values and rationalities could now become the springboard of future sustainable projects carried out under the banner of that consensual value. Unfortunately, just the opposite happened. Instead of the expected cooperative process, a 'competitive appropriation' of the consensual value -namely of the concept of sustainable development and its interpretation- developed, leading to the observed difficulties, dissatisfactions, and failures[8]. Why?

One possible interpretation of this aporetic situation is based on the concept of complex intelligence and its relationship with systemic logics. Each of the three poles of the 3E model holds a specific worldview which determines the way its representative stakeholders construct their own analysis of the problems, their own argumentation during the negotiation process, and their own course of action when implementing their decisions into a specific project. The current state of our Western scientific culture, with its almost exclusive emphasis on analytical, chain-like logical and causal reasoning in educational and pedagogical institutions, is the primary source of this worldview. As a consequence, an

economist will have the tendancy to consider environmental or social issues from his or her economical theoretical and conceptual framework; an environmentalist will do the same for economic and social issues and likewise for the third pole. This situation which is well known of course in negotiation theory, explains what we hear or read almost daily in the media, and justifies the conclusions that can be and have actually been drawn from various experiences and experiments in the ten year period between Rio (1992) and Johannesburg (2002). In the last decade or so, we have all been witness to a phenomenon, a tendancy, a collective movement, a political party, a paradigm, a highly mediatized demonstration or even a mere fashion, which has tried to pull the triangle either in the all-economic (econocentric), all-ecological (ecocentric) or all-social (sociocentric) direction. The problem is due to the difficulty to consider the triangle as a **system** rather than a mere assemblage, i.e. as a dynamic organic whole the logic of which can only be understood by complex intelligence[9].

I hope not to be misunderstood. My point is certainly not that all those projects that have been carried out under the banner of sustainability (or Agenda 21) with the methodological help of the tripolar model, have failed. There are indeed many achievements, in all kinds of contexts and at various scales, which can be stored in the chapter of success stories from a short-term perspective. In the long term however, one must admit that there are numerous reports of eventually emerging and quite rebellious problems resulting of -sometimes dramatically conflicting- situations. It is this observation which led me to question, not only the logical structure, but also the very substance of the tripolar model[10].

4. Anthropological unsustainability

The historical and genealogical analysis of our tripolar model shows that it originally stems from a bipolar configuration where socioeconomic development (anthropic, or cultural, pole) is opposed to environmental preservation (natural pole). This bipolarity is indeed still pivotal in the Brundtland Report (1987). Its transformation into a tripolar configuration is strongly bound to the political an economic context of the years that followed the latter, until the Rio conference. We will not inquire into how and why this transformation took place, since we are only interested in the fact that the tripolar model is the dominant model today, and that there is a good chance it remains so for a while. What I shall do instead is discuss the analytical and theoretical bases of the model in order to unveil some core contradictions, and eventually propose a new, hopefully more fruitful and more operational, model. As we shall see, the theoretical framework or viewpoint of design proves quite useful to carry out this discussion, along with other arguments borrowed from the economic and socio-political spheres. The reasons I characterize my argument as 'anthropological'[11] will become clear later; there is more to it than mere conceptual commodity.

The first problem with the model is the separation of the economic from the environmental or ecological domain. As their etymology already points to, economics and ecology belong to the same field and share the same logics: they both deal, very roughly speaking, with available resources, production, transformation, exchange, consumption, value, and make all kinds of computation of one or the other and of their respective relationships. Roughly speaking, again. A science of economics which does not take into consideration the whole system involving these processes does not even deserve its name. Why then leave to a distinct science the task of figuring out the ecological impacts of the global handling of natural resources? If indeed economics can be defined as the science which deals with the production, distribution and consumption of goods, with the material and symbolic aspects of exchange processes, and with the potential equilibrium between needs and their satisfaction, then the logical and structural separation of economics and ecology in a theorical model meant to guide human agency is an epistemological and practical fallacy. In many cultures, especially those based on agriculture, such an idea of economics is plainty unthinkable, since it proves totally unpractical according to the very logic of agricultural practice. Logically speaking, there is no reason to consider that, since the archetype of economic exchange is a give-and-take or cost-benefit relationship, the "give and the take" aspects of the relationship should belong to a different scientific domain. Obviously, my common-sense type of reasoning should be more qualified and discriminate. It actually could, and I am sure economists would have no troube developing a conceptually more sophisticated and rigorous argument with regard to their discipline. It would be surprising however that they end up with an opposite conclusion. What I am arguing were is not

that there are some environmental **aspects** that should be taken into consideration by the science of economics, in the sense one means that economic exchanges also have a social, or political, or semiotic component. No, the statement is much stronger: since there is no radical difference between economic and ecological phenomena, economics and ecology should be merged into a single pole, namely that of a more comprehensive general economics (or Economics with capital e).

We are now left with a bipolar model again, except that it is not analogous to the previous one mentioned above. Both poles here are of anthropic character; they both deal with human agency. Their respective purpose is different, if not divergent, however. By the way, notice that this bipolar model is very similar to the central dialectics of Marxian philosophy in the 19th century. We will come back to this later. Let us focus first on the third pole, namely on the social aspect of sustainable development.

Thousands of pages have already been written on those human or social aspects end on the way they should be understood and dealt with in sustainable projects. I have no pretention -nor do I really have the competence- to add anything dramatically significant to this corpus in such a brief paper. I will try to show however that the point of view of design, seen as a discipline whose theoretical and empirical concerns are centred around the phenomenon of the **project**, may constitute a contribution to what social sciences have already gathered on this rather vas subject matter. My field observations of actual projects reveal that the third pole of the 3E or 3P model, corresponding to the social (or human?) aspects and consequences of sustainable projects, is often used as a 'black bin' where all aspects not directly related to the two other poles can be thrown into. The bin collects all 'soft' aspects or variables of the analytic process, those which cannot really be quantified or rendered objective without losing their very meaning. As a consequence, the third pole is that which is subject to the widest and looseet interpretations. I have gathered a good deal of evidence of this fact from a number of ecodesigners and sustainable project managers. The situation is further beclouded by the fact that there is some confusion between logical and ethical arguments, between a hard deductive/objective reasoning based on figures and statistics (both in economics and ecology) and a more 'fuzzy' or 'philosophical' type of reasoning. In short, the third pole lacks adequate definition.

I believe that this dimension of sustaible development should be treated in a more discrimate manner. To insist almost exclusively on the **social** dimension of **human** issues, as is the case in the majority of projects I have observed, is missing one half of the problem. A more comprehensive stance consists in realizing that any human phenomenon has two principal dimensions: the **individual** and the **collective** dimensions or qualities. Psychology and sociology in one part, anthropology and ethnology in another, are academic disciplines which have split and shared the corresponding knowledge in the two respective dimensions. Let us now turn back to our model and see the consequence of this almost banal but decisive distinction. Social equity is indeed an important aspect that deserves to be given some priority in sustainable development. There have many convincing arguments developed on this topic. One should indeed expect that the wealth and riches created by the pole corresponding to Economics are fairly distributed, not only among the various social categories concerned by the project, but also with respect to future generations. But then, the following questions remain: **Who** gives the impulse to produce wealth? **Who** is initiating the projects? **Who** is deciding how the riches are to be distributed? In other words: Where is the **projectual dimension** of the social pole? This is indeed a typical design question. If this dimension is not explicitly handled in the discussion, then we are left with a sort Darwinian process, with an 'invisible hand' phenomenon leading one to derive a kind of determinism from the model. As a matter of fact, the more scientific and sophisticated our theoretical models of sustainable developement, the strongest the belief in their deterministic character. I could be contested that the projectual dimension is naturally included in the economic pole. Such argument results from an epistemological confusion which design researchers are well aware of since they have read Donald Schön: design is in no way the application of some pre-existing science, be it economics, sociology, semiotics or else, design has its own original epistemology. Furthermore, the logic of economics is a logic of means, and economic science is basically analytic, whereas the logics of design is a logics of creativity and initiative, design being basically pragmatic (in the philosophical sense). As we know from our basic courses

in philosophy, distinction should be kept between facts and values, and every designer knows that the process enabling to pass from one domain to the other is not a Darwinian-like process of emergence: it takes human engagement to transform facts into action, i.e. into values.

For all theses reasons and for the sake of logical clarity I believe the 'social' pole of the model should be split into the two separate poles of **social equity** and **social creativity**. We are thus left with a new configuration: a systemic model consisting of three dynamically interrelated dimensions correspondind to comprehensive economics (or Economics), social equity and human creativity.

5. A new 'holy trinity'?

What is the cognitive gain of this transformation? What is the point of redesigning a tripolar model into another, inverted, tripolar model? Have we but 'changed four quarters for a buck' as the saying goes? My answer is clearly negative. The first reason is that by including the design dimension into the model, we introduced a strong dynamic impulse which leaves us no choice but to actually address some very fundamental issues raised by human agency, especially when the latter takes the form of a project. The second reason has to do with the anthropological framework mentioned earlier.

The new proposed structure of our model happens to be analogous to the so-called 'threefolding' of the social order as proposed by philosopher Rudolf Steiner (1866-1925) at the turn of the 20th century. Steiner's first confrontation to social issues arose while teaching at the Popular University in Berlin. Although his first article on this topic dates as early as 1905, his major publishing and lecturing activity only really started after WW1. Steiner's very pragmatic stance explains why the content of his writings is deeply related to the historical and political context of the war. To this contextual aspect also belong the workers' movements of the end of the 19th century (the Russian Bolchevist Revolution and the hesitations of the newborn Weimar Republic. Conversely, the social and political philosophy of Karl Marx and his followers is the main intellectual reference against which Steiner's argumentation is constructed. One should not conclude therefrom that the influence of these contextual aspects is so strong as to relativise and invalidate Steiner's propositions for our contemporary situation, since the former result from a careful phenomenological inquiry into the logics and the origins of the social, economic, political and spiritual conditions. In this respect, Steiner shows quite convincingly how Marx's own inquiry into the social conditions was quite accurate, but that the materialist interpretation of his findings was faulty due to an inadequate anthropology. Interestingly enough and as we already noticed earlier, the bipolar -economics/society- reduction of the model we end up with after having integrated the economic and environmental pole into a more comprehensive economic one, is quite similar to the central problematic of Marx' philosophy and his famous 'contradiction of capitalism'. Marx asks how it is possible to reconcile both poles, i.e. to transform the dialectics into a superior synthesis in order to imagine an economic system respectful of the social aspirations of the workers. In terms of sustainable development, the question reads as follows: Is it possible to reconcile the economic and the social pole, i.e. to transform the duality into a dialectics whereby we could imagine an economic/technological system which is respectful of environmental constraints, warrant of social and generational justice, and capable of enhancing individual emancipation? The two approaches are quite analogous.

It is not possible to sum up Steiner's social philosophy here. There exist some good syntheses of it in the literature[13]. Moreover -and Steiner himself was very categoric on this point- what is called 'philosophy' here should not be considered as a dogmatic theoretical system of economics or political philosophy that would replace all the others. The threefold character of social life is an empirical constatation based on a phenomenological observation which we all could and should carry out by ourselves. What it reveals is that there are three fundamental qualities which characterise (or 'colour') our relationships whith other human beings, depending on the specific field on which the relationship is focused. The three fields, according to Steiner, are the 'economic', the 'political' and the 'cultural'. These should be considered as independent, meaning by that that they each obey to a distinct logic. He points to the fact that the three 'logics' used to be integrated into a unique system in earlier history (theocracy), the cultural aspect being the determining ruling force (religion). The two other forces progressively departed on an independant path in

successive times in history: the political in the Roman Empire, the economic during the Industrial Revolution.

In the economic sphere, says Steiner, the relationships between individuals are based on needs and mediated by goods, so that there is a strong mutual interdependance; its guiding logics is solidarity or **fraternity**, not in the moral but in the strict economic sense. The political sphere, that of public rights, is the world of essentially human relationships, in the sense that we consider the other not as a provider of some good or service, but as an equal; its guiding logics is therefore **equality**. In the cultural sphere, the relationships are based on the mutual recognition of one's own and idiosyncratic capacities, competences and potentialities, which can only be cultivated and developed in a non-oppressive intellectual, artistic or religious environment; its ruling logics is **liberty**. The three dimensions of fraternity, equality, and liberty are potentially present in every project. According to the threefolding principle, their respective singularity must be strictly respected when deliberating about economic, political, and cultural issues which arise in the course of the project so that, for instance, no political consideration should ever interfere with matters of cultural or economic import. Likewise, the cultural sphere should be carefully preserved from any economic or political interference, and so on. One must admit that this sounds almost nonsensical when checked against our contemporary habits. But isn't that exactly how Thomas Kuhn described what a new paradigm was to feel like at its beginning?

The analogy of the threefolding principles with the slogan of the French Revolution is not only a useful mnemonic artifice, but is also historically grounded. The analogy helps to understand the pathologies of the contemporary social and economic philosophy, where the three district guiding logics are put at the wrong place. By putting, for instance, the economic life under the rule of liberty, one experiences the drifting of extreme liberalism and its perverted or wicked consequences. Likewise, by insisting on equality being the basic value of the cultural life, for instance in education, one runs into the paralysing effects of egalitarianism, i.e. the levelling by the lower mean.

The very phenomenological and non-dogmatic nature of the threefolding model should discourage any discussion of it in a speculative, rhetorical, manner. As indicated above, it should be considered as a working hypothesis in the purest Jamesian pragmatic sense and as such taken out into the field (that of a design project) so that its fruitfulness may be experienced (or not). There are already a number of initiatives around the world where Steiner's threefolding model has been put into practice, in fields as diverse as agriculture, banking, business and management, educational and therapeutic institutions, etc[14]. The next step of this research project will precisely consist in this. Its current state has not yet allowed me to gather a comprehensive review of experiences (if any) carried out in sustainable design projects with the threefolding perspective. An outstanding example would be the network of biodynamic farms in operation worldwide. They should be considered indeed, for their management and landscape design principles, as potentially interesting case studies of contributions to sustainable development.

In the specific field of design, it would be interesting to analyse the extremely original and convincing experiences carried out under the advisorship of Ezio Manzini in Milan[15] in the light of the threefolding conceptual framework. Although Manzini's central theoretical and pragmatic framework draws mainly on Nobel Prize winner Amartya Sen's economic theory, I can see no contradiction at first right with Steiner's guidelines[16].

6. Some remarks on metaphysical issues

The paper has already pointed to the relevance of a reflection on the metaphysical aspects of design[17]. The reason these aspects should be considered important is that they determine our way of dealing with design projects, both in theory and practice. They provide us with -or imprison us in- our intellectual habitus and influence our interpretive activity. It is therefore a useful exercise to bring them to light so that their deterministic effect can be evaluated and eventually modified.

The one aspect I wish to draw attention to in the context of this paper is the dualistic, polarised scheme used in practical deliberation, throughout the Western intellectual culture. The archetypal figure of this polarising pattern is the iconographic interpretation of the Last Judgment, especially visible in Catholic architecture, sculpture, painting and glasswork.

The central figure of Christ is dividing the space into the two opposed realms of the good and the evil, of the saved and the damned. But one can find this moral topology also in the non-Christian iconography, for instance in Greek-Roman mythology where some hero is bound to choose between vice and virtue, between hell and heaven, between beauty and ugliness, etc. What seems to have encouraged the emergence of such a strong polarity is the 'ontologising' of this central scheme into a static form. The origins of the scheme stem way back into the earliest cosmogonies of pre-Socratic philosophy, gut it was undoubtedly strongly reinforced by Platonic dialectics and Aristotelian ethics. What has been lost in the course of their respective interpretations is their dynamic character, leading to the 'ontologising' phenomenon mentioned earlier. The two opposing entities have ended up being considered as the final outcome of a process, whereas they are originally to be thought of as a process in its own right, namely as the very movement of human thinking or acting. When considered from such a dynamic viewpoint, there always appears a third member in the diad. Thus, for instance, the iconology of the Last Judgment is truly incomprehensible without the central figure of Christ. Particularly sophisticated and interesting in this respect is Aristotle's definition of virtue. In his ethics, virtue is not the opposite of vice, but virtue is a mean between two extremes, between two vices, one in excess and one in default[18]. A mean, however, which is not arithmetical or 'Darwinian', but a mean which is produced by human agency and is to be renewed, re-invented, **re-designed** in each new situation. The topology of Aristotle's principle is therefore triadic and dynamic. A careful meditation of these observations may lead us to the following conclusion. Whenever, by analysing a phenomenon, we discover it is structured along a polar contradiction (as in Marxian philosophy for instance), we should be looking for the third member of the configuration in order to transform the diadic into a triadic gestalt[19]. Very evocative in this respect is Rudolf Steiner's own artistic interpretation of this fundamental principle. The monumental wood sculpture he personally conceived and made at the end of his life, the *Representative of Humanity*, shows the central figure of the human being who is torn apart between the two poles of spiritual and material temptations. Not between good and evil, but between two figures of evil, where intellectual arrogance on one hand, and the intemperance of materialistic hedonism on the other, may be recognised as typical incarnations of the Western mind.

The archetypical property of Steiner's threefolding model derives from his anthropological anchoring. This is precisely the main reason why its pragmatic and operational fruitfulness deserves to be experienced in design, more specifically in sustainable design. Such is both the conclusion of this paper and the starting point of the next phase of the corresponding research project.

7. Conclusion

The research originates in the empirical evidence that the use of the 3E or 3P model as the main reference for sustainable design projects consistently faces insuperable contradictions and dissatisfactions among the project carriers (designers, clients, users, etc.). A critique of the central model appeared therefore to be necessary. The main inconsistencies of the model can been uncovered when the critique is carried out both from a systemic or an anthropological-philosophical perspective. In effect the former appeared only as a preliminary step toward a more fundamental reconsideration of the logical foundations of the model. It appears possible to surmount the so-called 'anthropological unsustainability' of the model by an inversion of its triadic structure and a renaming of the correspond poles. The model then becomes analogous to Rudolf Steiner' threefolding model he proposed after WW1 in order to construct a more human social order. This model has since proved fruitful for the design and management of various economic and social initiatives. The strong analogy this research has made obvious between the threefolding and the modified 3E or 3P model used in sustainable development leads to the conclusion that it might be fruitful to work with the latter in further sustainable design projects. The three poles of the rectified model are the following: 'comprehensive economic' (or economics with capital E), 'social equity', and 'human creativity'. The ruling logics of the respective poles are the ones identified by Steiner , namely and respectively the logics of fraternity, equality and liberty.

As already stated at the beginning of this paper, the methodology adopted in this first phase of the research project is mainly speculative, but it was preceded by a careful phenomenological observation of projects-in-action, mainly but not exclusively in the field of design. The general argumentation is not as well supported on empirical and

bibliographical evidence as one might wish or expect. However the pragmatic viewpoint adopted all over allows research to proceed along concurrent paths, provided the necessary work is carried out parallel to the field work, according to the methodological foundations of project-grounded research in design.

My conclusion is far from being ... conclusive. This research in progress is now entering a new phase, in the form of a situated 'reflection-in-action' experience, whereby the potential of our new threefolded model will be put to test.

NOTES

1- One noticeable counterexample is the so-called 'Chaos Report' published by the Standish Group. See for instance the "2004 Third Quarter Research Report" at www.standishgroup.com/sample_research/chaos-1994_2.php (accessed 02.15.07)

2- This issue is raised in similar terms, although in a different theoretical context, by Pierre-Luc Lalonde in his Ph.D. project titled *Structuration de l'espace agissant de la pratique de la gestion de projet Montréal, Ecole polytechnique*, 2007, 124pp. The argument goes as follows. The causes of failure in engineering projects are usually diagnosed with reference to the standard, instrumental and normative, model in project management (the so-called 'Cost, Time and Quality' model): cost overrun, time overrun, and/or poor quality delivery. Various evaluation guides and methods have been designed to assess and audit such projects. However, there are instances where, although successful with regard to standard evaluation, some projects nevertheless are considered as unsatisfactory or unsuccessful by their stakeholders and clients. The source of this aporia lies in a too restrictive definition of what one considers as a good project, i.e. in the very central theoretical model adopted by project managers.

3- In the plenary paper he delivered at the 'Wonderground' DRS International Conference in Lisbon (November 2006), titled "Worldviews for Design Theory", Per Galle urged design researchers to be more critically aware of the basic metaphysic assumptions on which, according to Peirce, design theory rests. In his abstract, Galle thus proposes "a method by which the philosophy of design may develop sound metaphysical foundations (worldviews) for design theory".

4- Findeli A., "Die projektgeleitete Forschung : eine Methode der Designforschung" in R.Michel (ed.) *Erstes Design Forschungssymposium*, Zurich, Swiss Design Network, 2004, pp.40.50. French version available at www.din.umontreal.ca/findeli.html under the title "La recherche-projet : une méthode pour la recherche en design" (Project-grounded research: A Methodology for Design Research).

5- One must be very careful with the choice of terminology in such a pragmatic framework. In project-grounded research, a

"hypothesis" becomes a "problem" or, better, a "problematics", since the main purpose of such research is to improve design practice, not to increase the truthfulness of descriptive theories. Therefore, theoretical and practical endeavours must be closely interrelated in a highly dynamic dialectical process. This means: 1) that the theoretical 'models' mentioned in the text are not **tested** as in conventional experimental science, but 'put at work' or **situated** in context; 2) that the validation criteria of these models are not thruth and generalisability, but relevance and fruitfulness (for practice); and finally 3) that each new practical situation is an opportunity to devise (or improve) these theoretical models, so that the latter are not the result of a **deductive** but of an **abductive** process. The entire methodological procedure of project-grounded research is recursive, with a Möbius ribbon or an Escher-like morphology/topology.

6- Brunel, S., *Le développement durable*, Paris, PUF, 2004, *passim*.

7- This is a very short abstract of a long argument developed by Aurélien Boutaud in his doctoral dissertation *Le développement durable: penser le changement ou changer le pansement?* (a truly intranslatable play on words), Saint-Etienne, École des Mines et Université Jean-Monnet, 2006, 523pp. Downloadable at www.emse.fr/site/themerecherche/boutand.htw .

8- *Ibid.*

9- The characteristics of complex intelligence cannot be developed in the framework of this paper. Besides that, I hope it is an insult to the design research community to believe that these characteristics are unknown in the field of design. As a matter of fact, design thinking is a kind of complex intelligence in action. Which designer is not trying to come up with a beautiful, good and inexpensive product? The epistemological status of a design outcome is indeed that of such an organic whole, since it is a 'synthesis' of usually conflicting and mutually exclusive 'variables'. Throughout the design process moreover, the systemic structure of the object remains dynamic, until it is 'frozen' into a product. The necessity to develop complex intelligence in primary and secondary schools has been strongly advocated in France by sociologist Edgar Morin. He is also one of the main inspirations of the European research network built by Jean-Louis LeMoigne during the last 30 years (the other one being Herbert Simon) named *'Réseau européen pour la modélisation de la complexité'* (www.mcxapc.org).

10- From a different perspective, the Research Chair for Ethics at the University of Montreal (CREUM) came to the conclusion that the very concept of sustainability had become empty for having been subject of a too large extension. A fundamental philosophical and conceptual work on the meaning of the concept was therefore felt to be necessary. See the proceedings of the 2006 conference, *The future of sustainability?*, available online on the Chair's website: www.creum.ca.

11- 'Anthropological' is meant here in its philosophical sense. In this respect, we are dealing with the different points of view under which the human being is considered, described, and represented ('theorised'). This appears somewhat in opposition with the conclusion of one of the participants to the conference mentioned in footnote 10, Catherine Carrère, who writes that the contradictions to which the diverging interpretations of the concept of sustainability lead us could only be overcome by changing our core question: "The issue [...] is not in the choice between humankind and nature, but in a reflection upon our concept of nature" (P.17). As we shall see in the paper, my conclusion is rather an invitation to reflect upon our concept of the human being.

12- The written contribution of Rudolf Steiner to the social issue consists in a book and a series of 13 articles. The original works are in German. My references are mostly in French, but English speaking readers may easily find the corresponding works since Steiner's books and lectures are classified according to the GA system (*Gesamtausgabe*) used for the complete works. Steiner, R. Fondements de l'organisme social (GA 23-24), Genève, Ed. Anthrop. Romandes, 1985 (original German edition : 1919 for GA23, 1915-1921 for GA 24). Besides these written basic works, Steiner delivered around 200 lectures and courses on social threefolding to which should be added his lectures on education, agriculture and therapy, in which practical, economic, and organisational issues were raised and discussed. For more information, see the website of the Goetheanum (www.goetheanum.org), seat of the *Freie Hochschule für Geisteswissenschaft*, the Free University created by Steiner in 1923, which has a department named *Sektion für Sozialwissenschaft*.

13- Among many others: Nouyrit, H., *Fraternité, Egalité et Liberté. Actuolité de la pensée sociale de Rudolf Steiner,* Paris, Triades, 2004; Steiner, R. & Houghton Budd, Chr., *Rudolf Steiner Economist*, Canterbury, New Economy Publications, 1996; see also the *Tolking Economics Bulletin* available at www.talkingeconomics.com.

14- The most ambitious contemporary example is Nicanor Perlas' Agenda 21 Program for the Philippines (www.cadi.ph/nicanor_perlas.htm). Other noteworthy cases are: the Sekem initiative, founded 1977 in Egypt (www.sekem.org), whose initiator, Ibrahim Abouleish, was granted the so-called 'Alternative Nobel Prize' together with Perlas in 2003; the banking enterprises of GLS (G), Triodos (NL), Mercury (UK), Merkur (DK), Nef (F).

15- Manzini's basic principles for 'strategic design' are synthesized in his "Design, Ethics and Sustainability. Guidelines for a Transition Phase" in Sotamaa, Y. (ed. in chief) and Salmi, E. & Anusionwu, L. (eds), *Nontes Cumulus Working Popers*, Helsinki, UIAH University of Art and Design, 2006, pp. 9-15. The same proceedings, downloadable at www.cumulusassociation.org , also include three case studies conducted at the Ph.D. program of Milan Polytechnics by S. Maffei & B. Villari, A. Meroni, and C. Cipolla.

16-Nouyrit (see footnote 13, pp. 84-85) criticizes Sen's "methodic reflection upon the very complex and infinitely diverse play of the equality-liberty couple" for not having thrown strong enough a bridge between both poles; the mediating role should, according to Nouyrit, be given to fraternity (*"affectio societotis"*), in order for his theory to become more practical and fruitful. Nouyrit's professional experience has been in the cooperative movement in agriculture and in the construction the European Community. He is one of the founders of the Nef bank (*Nouvelle économie fraternelle*) in France in 1978, and currently major of a small village in the Southwest of France.

17- See footnote 3 and Per Galle's contribution in this respect. In an earlier essay on the Bauhaus, I already hinted at some metaphysical aspects of design theory and ideology. Findeli, A., "The Bauhaus Project : An Archetype for Design Education in the 21th Century" *The Structurist*, 39/40, 1999/2000, pp. 36-43.

18- Aristotle, *Nichomochean Ethics*, for instance II, 104 a 10-25 or 1106b 22-28.

19- French philosopher François Julliens's very thought provoking comparative study of Chinese/Eastern and Greek/Western philosophical traditions is extremely helpful to uncover our own metaphysical guiding axioms. His conclusions are usually quite useful for design thinking and project theory. See for example his *Du mol/Du négotif*, Paris, Seuil, 2004, where one can read that "China enlightens the tragic character of European thinking" (p.109).

THE BALANCING ACT OF PRODUCT DISCOURSE AND PERFORMANCE

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Abstract

What is to be designed into a product to make it highly desirable? The aim of this research is to identify these key attraction points: innovativeness, environmental aspects, brand identity, symbolic, aesthetic value and others. It is this dance between product performance and discourse that brings product's appeal.

As a result of a literature review, the key elements of product attraction are visualised in a model. This model presents "what the product does" and "what it communicates". It contains five basic elements: 1) functionality, 2) price, 3) aesthetics, 4) symbolic meaning and 5) ergonomics. More detailed categories, such as brand identity are part of these five basic elements.

For the field research, a questionnaire was designed that investigates the reasons for loving or detesting a product. Around seven hundred undergraduate students completed this questionnaire analysing a loved or detested product of their choice.

This research is still in process. The main objective now is to define an appropriate structure for the analysis of the questionnaires. A coding system used by Csikszentmihalyi and Rochberg-Halton (1981) is a good basis, but adjustments are needed. Since 1981 the market has changed and the two studies differ. New products with a high affective value have emerged - portable phones, video games and MP3 players - and brand identity is more important in the present study. Furthermore, the respondents of the two studies have a different life style and at present both detested and loved products are analysed.

Introduction

In research concerning the new product development process, Cooper and Kleinschmidt (1995) found product superiority as the number one success factor, but some companies miss the competences to make the right design decisions (Dickson, Schneider, Lawrence and Hytry, 1995). It remains a vital challenge for companies to develop products that are superior from competitors' products. Part of this process is to identify what makes a product superior and highly desirable and secondly to be able to integrate these characteristics in the new product design.

This present research examines the first part of the new product development process: "What is to be designed into a product" to make it highly desirable. It aims to identify key attraction points, varying from a product's innovativeness, environmental aspects, brand identity, to symbolic or aesthetic value. In this study reasons for "desiring" a product and also reasons for "detesting" a product are examined.

This article start with a literature review of different research domains: the design management field, the product attachment and material possessions literature, and new product development studies (NPD studies). As a result of this literature review, a model for a product's key attraction points is proposed.

For the field research of the present study, two interview forms were designed. One examines on the reasons for "loving" a product, the other on the reasons for "detesting" a product. The respondents are students, following a higher education in business studies, in the age group 20 to 28 years. Around six hundred students from the Grenoble Ecole de Management have completed the questionnaires. The questionnaires were also completed by around hundred architecture students from the Grenoble Ecole d'Architecture.

The last section of this article describes how the results from the questionnaires will be analysed. The analysis of the interviews is built on the structure of the Csikszentmihalyi and Rochberg-Halton (1981) study. In the study "domestic symbols and the self", Csikszentmihalyi and Rochberg-Halton (1981) interviewed families in Chicago about items in their households having special meaning to them. They found 41 categories of objects and 37 reasons why objects were special. The product categories and reasons for products to be special of the Csikszentmihalyi et al. (1981) study need to be adapted to the present study. Since this 1981 study, new products with a high affective value have emerged, for example electronic products, such as portable phones, computers, videogames and MP3 players. The present respondents are students following an academic education. Their needs, life style and financial resources differ significantly from the interviewees in the Csikszentmihalyi et al. (19B1) study, that deals with family members in different age groups.

This article explains how the research results will be analysed. A thorough analysis of the present research results will be the next step. Some findings are, however, presented in this article.

Literature Review: Key Aspects of Product Attraction

This first section investigates key aspects of product attraction by analysing what is described in parts of the design management, the material attachment and the new product development literature.

From the Design Management Literature: Products, Characteristics

Möno (1997) describes products as objects with an ergonomic, technical and communicative side. The ergonomic side relates to adjusting the product to human physique and behaviour. The technical side represents the product's functionality, construction and production. The communicative side relates to the product's ability to "communicate" with humans and to "adjust" to human perception. He considers that every product is created in compliance with certain economical (price) and ecological constraints.

Bürdek (1996) and Steffen (2000) distinguish the product's practical functions (its functionality) from its language (its communicative side). The product's communicative side is then divided into two different types of communication. One concerns the product's aesthetics and the other relates to the semiotic functions that give meaning to the product. As regards the meaningful, semiotic functions, a product can give information about itself, about its user and about the company's brand identity (Gotzsch, 2003). Humanised shapes give a specific "identity" or character to a product. Making a product alive contributes to product attraction. A product also communicates its user's personal characteristics such as age, gender and personality or informs about its user's social status and ambitions.

Functional and the communicative aspects product are essential parts of a product's structure. The communicative side of a product contains aesthetic and meaningful symbolic aspects (Bürdek, 1996; Steffen, 2000). A product's structure also includes ergonomic, costs and ecological elements (Möno, 1997).

From Material Attachment Literature: Reasons for Liking Products

Product attachment has received considerable attention in sociology and psychology. In our society, people have a personal attachment to products. Products do not need to be expensive to be objects of attachment (Kleine and Baker, 2004). Products that remind of specific events, gifts, objects from heritage, products that we appreciate for its function or aesthetic pleasure can be important to us. Marzano (2000) and Luh (1994) suggest the link between the Maslow hierarchy of psychological needs and the attachment to possessions. According to Maslow, human needs and motivations are divided into five hierarchical steps; basic needs, safety and comfort needs, love and belonging needs, status and self-esteem and ultimately the need for self-actualisation. A person usually tries to climb the ladder of these different human needs, from basic needs towards the higher steps of self-actualisation. In the context of a mass-consumption society, individuals partly satisfy their human needs through the acquisition of products. For example, smoke detectors address safety needs, cosmetics promote a feeling of greater acceptance and automobiles are related to status needs (Semenik and Bamossy 1993).

Products often communicate connections with other people, but also express personal identity. Belk (1988) specifically refers to the meaning of possessions as a reflection of our identity when he states; *"our accumulation of possessions tells us who we are, where we come from and perhaps where we are going"*. Dittmar (1991) with *"to have is to be"* and Csikszentmihalyi and Rochberg-Halton (1981) also reveal the significance of belongings for the individual self-concept and for the communication of one's own identity.

A lively reaction towards products is possible. Products make people happy, angry, proud or can rouse a variety of emotions, such as fascinating, surprise or irritation (Desmet, 2003). This reaction is influenced by personality and individual experiences age, time-of-life and gender (Jordan 1999; Kleine and Baker 2004).

From New Product Development Studies: Key Factors of Product Success

Product innovation is crucial for competitive advantage. According to Cooper and Kleinschmidt (1995), a product should meet customer needs better than competitor's products and should be innovative and novel. This implies the following product characteristics;

- Unique features for the customer
- Meets customer needs better than competitors' products
- High relative product quality
- Solves customer's problems with competing products
- Reduces customer's costs
- Is innovative and novel

Developing an outstanding product is difficult. Many managers believe that design issues will be of increasing importance for their firms' competitiveness, but that their company lacks the competences to make the appropriate design decisions (Dickson et al., 1995).

At present, the emphasis is moving away from product functionality towards embedding more "emotional characteristics", in a product's design, since this is increasingly important for product differentiation.

Proposed Model for the Key Aspects of Product Attraction

In this section, a model is proposed that presents the "key elements of product attraction". This model combines the basic elements of a product structure (Bürdek, 1996; Möno, 1997; Steffen, 2000) with the characteristics found to be important for product excellence (Cooper and Kleinschmidt, 1995).

The proposed model draws a distinction between the product's functional value and the product's communicative product value (see figure 1). In other words, this means that the model distinguishes *"what a product does"* from *"what the product expresses"*.

The building stones of a product structure in the proposed model are: *"performance"*, *"ergonomics"*, *"aesthetics"*, *"symbolic meaning"* and *"costs"*. To obtain product excellence and competitiveness, the factors performance, ergonomics, aesthetics and symbolic meaning should be maximised, while the factor costs should be minimised. Some aspects of performance, ergonomics, aesthetics and symbolic meaning should outperform competing products in an innovative way by enhancing latent user needs and new technological possibilities. We will now discuss these five factors of product excellence (see figure 1).

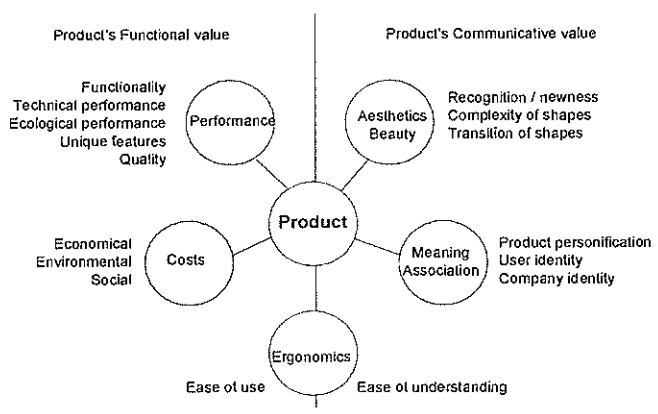


Figure 1. Proposed model: Key attraction points of a product's design

Costs: Economical, Environmental and Social Costs

Within the model, the key element indicated as "costs" should be maintained low to make a product desirable. Price aspects

predominantly influence product attraction. Costs are not only economical, but also encompass environmental and social costs. Economical, environmental and social costs are inter-dependent. Fair trade products, such as coffee from small producers being paid appropriately, take social costs into account. This raises the product's sales price, but contributes to product attraction.

Multiple solutions are available to diminish environmental costs, for example by an appropriate use of eco-friendly materials or by reducing energy consumption during product usage. This in itself contributes to product attraction and has the potential to reduce the product's financial cost structure during the product's life cycle.

Product Performance: Technological, Functional & Ecological Performance

A product's performance (figure 1) includes functionality, technological performance, the presence of attractive features, originality, innovative concept and product quality, always compared to other available products. A competitive product has unique features for the customer, a relatively high product quality, solves customer's problems with competing products and meets customer needs better than competitors' products (Cooper et al., 1995).

Next to its functionality and technological performance, a product also has an environmental and social performance. With growing awareness of environmental issues by consumers, companies and regulators, a product's ecological performance is likely to become significant for product appeal and design.

User-Centered Aesthetics

The product's aesthetics and its meaning are key elements with purely communicative value. Aesthetics corresponds to the beauty of the product design and is based on the purity or complexity of the product's shape, details and colours. Familiarity or newness of a product's shape influences the appreciation of its aesthetics. Aesthetics should be appealing to the product's user and might not be appreciated by others.

A timeless design reduces the need for early product replacement (before the end of the product's technological life span). In some exceptional cases, designers succeed in creating long-lasting icons. A car that does not look old-fashioned, but that has become a classic design is an example (Otto, 2005).

Symbolic Value

Symbolic meaning is based on personal and cultural associations. Symbolic meaning of a product can be expressed at three levels: expressions about the product, its user or its brand *identity* (Gotzsch, 2003, 2005). Symbolic value can increase its appeal and consequently prolong its usage.

Product attraction is created by giving products "lively characteristics", for example by using animal forms in automotive styling (Burgess and King, 2004) or by given the feeling that there is a person behind the product when the product is hand made. It can also communicate elements of user personality or convey brand identity. Colours, shapes and materials in a product's design can be used to address status needs or to express group membership.

Ergonomics

Ergonomics lies on the dividing-line between communicative and functional product characteristics. Ergonomics help the user to understand how the product should be used (the communicative side of ergonomics). It also concerns the physical comfort of product usage and thus clearly contributes to the product's functionality. When the product is comfortable, and a pleasure to use it will be more attractive for a longer period of time.

Methodology for the Field Research

Discussing the multiple key attraction points of a product's design (see figure 1) with international business students in their last years of masters studies had the objective to make these future marketing and company executives aware of the importance of product superiority. As a result of discussions in the classroom, two questionnaires were developed. One focuses on the reasons for "loving" a product, the other one on the reasons for "detesting" a product. The questionnaires take into account multiple aspects, such as the product's functional performance, meaningful and communicative

elements related to the product itself, to the user's personality and the brand identity.

Each student was asked to select one industrially produced product that he or she either particularly appreciates or detests. They could choose all types of consumer product, from a simple toothbrush to a luxury car. They were asked to take into account all characteristics directly linked to the product, such as its shape, colour, symbol and performance. The reasons for the product choice, as well as their associations, appreciation for aesthetics and brand identity, and the product's role in the communication of their self-identity were examined with open questions in the questionnaire. The questionnaires were first pre-tested by six students. Following their remarks, this resulted in the questionnaire structure that is presented in figure 2.

Theme	Question
Description of objective	In this exercise you will analyse a product from daily life that you particularly appreciate. You can choose from all kinds of consumer products, from a simple toothbrush to a luxury car. Please take in consideration the characteristics directly related to the product, such as its shape, colour.
Identification of product	1) Please include a photo, the name and the description of the product.
Knowledge about product	2) Did you already buy, utilise or consume this product? If so, since when and at which occasion? Please indicate when you have never used or owned the product.
Reasons for product choice	3) Please describe why you choose to study this product. I have chosen this product, because ...
Description of appreciation	4)You have chosen a product that you appreciate very much. Please describe everything that you appreciate in this product. I love ...
Associations	5) What does the product make you think of? This product makes me think of ...
Description of disliking	6) Describe what you do not appreciate in this product. I do not like / I do not appreciate ...
Emotional reaction	7) Please give all the qualifications that comes to your mind when looking at this product (for example I find this product ...).
Principal message	8) What does this product communicate most?
Values	9) What are the values communicated by this product?
Company and brand identity	10) Does this product give information about the company or the brand identity? Please indicate which information about the company or brand identity you perceive.
Company and brand identity	11) Is the product's image coherent with the brand's identity? Please indicate how the product fits the brand identity?
Product's intrinsic value	12) When looking at the product which impression do you get of the product? (For example about its quality, its usage, its origin, culture it comes from)
Aesthetics	13) What do you think about the product's aesthetics? Please respond as precisely as possible and give details.
Self image	14) Which impression about you does this product send to others?
Identification interviewee	Your name: Your school: Grenoble Ecole de Management / Grenoble Ecole d'Architecture Your age: Male / Female Your nationality Since when do you live / stay in France?

Figure 2. Questionnaire structure: The analysis of a product that you love very much

The above questionnaire examines reasons for "loving" a product. A second questionnaire was developed to study reasons for "detesting" a product. In this questionnaire, only the description of the objective of the study and two of the questions were different. The objective and the two different questions are presented in figure 3.

Theme	Question
Description of objective	In this exercise you will analyse a product from daily life that you particularly detest. You can choose from all kinds of consumer products, from a simple toothbrush to a luxury car. Please take in consideration the characteristics directly related to the product, such as its shape, colour, symbolic value or performance.

Description of detesting	4) You have chosen a product that you dislike very much. Please describe everything that you detest in this product. I detest ...
Description of appreciation	6) Describe what do appreciate after all in this same product. I do not detest / I even appreciate ...

Figure 3. Questionnaire structure: The analysis of a product that you detest

The students were given a word file with the questionnaire structure to be completed. In general the students participated with enthusiasm. The lecturers in the design course collected the questionnaires by email and the students also presented their products during the design course.

Around six hundred students from the Grenoble Ecole de Management and around hundred architecture students from the Grenoble Ecole d'Architecture have completed the questionnaires. The two types of interviewees might allow examining differences in aesthetic preferences and reasons for liking or detesting a product.

More details on the product's intrinsic values, such as aesthetic qualities and brand identity are also taken into consideration. Finally, this research not only concerns products that are loved, but also products that are hated.

Methodology for Analysis

In the Csikszentmihalyi and Rochberg-Halton (1981) study, coding categories were used to classify the products that had specific meaning for habitants in Chicago households. The reasons for this special meaning were also categorised. The analysis of the present questionnaires uses a similar system. We will now examine the applicability of the product categories and the categorisation of meaning of the Csikszentmihalyi et al. (1981) study for the present study.

Product Categories

Csikszentmihalyi et al. (1981) studied household objects having special meaning to one of their inhabitants. For the present study all types of consumer products could be chosen and the interviewees were predominantly French students, but also students from other nationalities. For the desired or detested object choices, this resulted in a variety of products, such as clothing, shoes, cars, perfumes, sports articles, iPods and MP3 players, portable phones, food and decorative products.

Csikszentmihalyi et al. (1981) listed product 41 categories to account for all the 1694 objects mentioned by the 315 respondents. Some of the categories were broken down in sub categories, e.g. furniture was broken down in separate categories of dining room sets, chairs and so on. When applicable the Csikszentmihalyi et al. (1981) product categories list will be used and newly mentioned objects will be added to make it suitable for the present study. Multiple product categories used by Csikszentmihalyi et al. (1981), such as bed, plants, aquarium, pets, bath, yard were not mentioned in the present study and are, therefore, left out of the product category list. New product categories, such as food, personal care products will be added during the analysis of the questionnaires. As a result the analysis will start with the following product categories (see figure 4).

1 Furniture	
2 Home decoration	Lamps, carpets, quilts, textiles, candle sticks, clocks
3 Tableware	Plates, silverware, glass
4 Visual art	All two-dimensional representations, other than photographs Paintings by children or made by relative, friends are included
5 Sculpture	
6 Collections	e.g rock or butterfly collections, comic books, letters
7 Musical instruments	Piano, guitar
8 TV	
9 Stereo, music players	
10 Radio	
11 Books	
12 Photos	
13 Appliances	Washers, dryers, toasters, coffee-machines
14 Tools	
15 Sport equipment	Does not include clothes

16 Trophies	
17 Camera	Refers to all photographic equipment
1B Toys	Including videogames, excluding athletic equipment
19 Clothes	T-shirts, jeans, shoes
20 Jewelry	
21 Vehicles	Cars, trucks, motos vespas
22 Telephone	

Figure 4. List of product categories for the present research adjusted from Csikszentmihalyi et al. (1981)

Product meaning

Csikszentmihalyi et al. (1981) defined thirty-seven categories of meanings an object could have for its owner. An object that had a special meaning, because it reminded its user of a specific place, was for example given the code number 4 (e.g. "we got this in Tunisia"). The Csikszentmihalyi et al. (19B1) coding system is detailed and applicable to the present study (see figure 5). The analysis of the present study will, therefore, start by using this structure. A pre-test using this structure will be made with 30 questionnaires to identify additional meanings or a more appropriate way of structuring product meaning for the present study.

Some elements, such as brand identity, are missing in the Csikszentmihalyi et al. (1981) coding system. Brand identity is relevant in the present research and is very often mentioned by the respondents. Brand identity and a more detailed structure concerning the product's intrinsic qualities (Gotzsch, 2006) will be added in the pre-test phase.

Past	
A) Memories	
1 Memento	Memories in general, not associated with particular occasion
2 Recollection	Memories of specific occasions in respondent's life-time
3 Heirdoom	Object handed down in family
4 Souvenir	Memory of a place
5 Had it for a long time	
B) Associations	
6 Ethic	
7 Religious	
B Collections	
9 Gift	Subcodes for occasions: 1 Birthday, 2 Christmas, 3 Wedding, 4 Anniversary, 5 Religious occasion, 6 Multiple Occasion Present-Future
A) Experience	
10 Enjoyment	
11 On-going occasion	
12 Release	
B) Intrinsic Qualities of the Object	
13 Craft	
14 Uniqueness	
15 Physical description	
C) Style	
16 Style	
D) Utilitarian	
17 Utilitarian	
E) Personal Values	
18 Embodiment of an ideal	
19 Accomplishment	
20 Personification	

Figure 5:Meaning classes and categories by Csikszentmihalyi et al. (19B1)

Conclusion

The creation of products that are desirable for its user is a complex process, since it deals with multiple and often subtle product characteristics. Product success depends on this balance of product discourse (its communication) and it performance. Having an overview of aspects, that have the potential to make or break a product's success, facilitates the creation of new products and brings a product's design close to the users' expectations and needs.

Future Steps

The presently collected questionnaires "on reasons for loving or detesting a product" should now be analysed. The

Csikszentmihalyi et al. (1981) categories and coding structure forms a thorough basis to start this analysis. Especially the meaning categories are detailed and appropriate for the analysis phase.

The list of product categories will be completed while pre-testing it on the first 30 questionnaires. The meaning categories will also be fine-tuned to the present research, using the more detailed structure of product expressions, related to the product, its user and the company (Gotzsch, 2006) and the key elements of product attraction.

Biographical Note

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"INTERFACES OF THE REAL": SEMANTIC DISCOURSE OF OBJECT AND CONSUMPTION IN INTERACTIVE PRODUCT DESIGN

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Abstract

Semantic investigations of the contemporary product forms (which are generally mentioned as the outcomes of computerized culture), evolution of design processes with reference to these new forms, and the reflections of these paradigms on the cultural structure create promising expansions for the researcher as emerging fields of design research. The development of information technologies and social interaction apparatuses have been a strong motive behind the formation of modern consumer culture, since *information* itself has become a new consumption utility. Thus, the structural and semantic shift from physical object to representation, from product-systems to information architecture and from user (consumer) to co-author has also reallocated the role of designer.

This article explores the major promises and contributions of interactive new media applications to design research field by focusing on three key concepts of design: *product, designer* and *user* - the recent connotations of which require the involvement of metaphorical and representational associations with the conventional social structure. However, these connotations may also refer to diverse signifiers within this original context in order to form a genuine language of new media. It is intended to figure out the evolutionary patterns of the alteration in their semantic conditions; by investigating the distinguishing features of computerized media and virtual object-systems, identifying their involvement in the product design field and outlining the consequences of this identification on socially structured system of values.

Keywords: Product Design, New Media, Interaction Design, Object, Product, Consumption, User, Representation, Semantics

Introduction

Virtual spaces, digital binary-coded objects and interactive media applications became increasingly popular topics of discussion within popular culture, and of academic discourse within various fields of research – including visual culture, design and media studies, and so on. Since each field discusses the subject matter from different (and subjective) points of view, it is evident that a solid academic discourse on interactive products and mediums should also be argued from a designer perspective; mainly because the social comprehensions and developing definitions of contemporary product forms would re-structure the product design profession, as well.

The basis of these conceptual changes in the structure and the definition of design profession may be investigated through a range of focal points; through the essence of the objects of study or the method by which users interact with them as well as the involvement of these new paradigms to design process itself.

> Digital technology has contributed to the emergence of new roles for the designer according to the nature of his interaction with the media. The designer today interacts with, controls and moderates generative and performative processes and mechanisms. Information has become a 'new material' for the designer.
> (Oxman, 2005: 242)

As Oxman discusses how digital technology has affected the design process and the materials that are employed by the designer, it is also meaningful to propose another dimension of discourse – an expanded view that involves the outcomes of the design process (the products) and the consumption sequence

of these outcomes by the users through similar technologies but different tools. It is critical to investigate the life-cycle of interactive products with a broader perspective -including different steps of design, production, reproduction and consumption- mainly because the roles of conjectural participants –designer, author, producer, user, consumer, etc.- and their definitions may coincide or overlap during the whole process. In this text, the intricate nature of contemporary object-consumption cycle will be explored by investigating the essential features of digital objects and virtual environments; their connotative resemblances and distinctions from our existing codes of representation and the methods by which we interact with them.

"New Media" and "New Media Object"

> A new medium is new only until it is established and no longer new; but since any usage of a medium is based upon communicative conventions, a new medium is somewhat of a contradiction. By defining the medium as "new", we acknowledge the transitory stage of integration of our current analysis, limited though this may be by its temporal frame (Brody, 1999: 135).

Studying new media and the new object requires focusing not on a specific time period or a set of technological developments but considering the social motives and conventions of its evolutionary pattern; mainly because a significant amount of the definitions and connotations are borrowed (or evolved) from the cumulative library of ontological classification. The most noticeable and authentic contribution of contemporary "new media" would be proposing new conceptual features (such as interactivity, customization, ambient intelligence, etc.) and environments to enhance user-product interaction through various computerized media (Software Interfaces, Cyberspace, Virtual Reality, etc).

Manovich (2001: 20) offers a rather reasonable description for New Media and New Media Objects as: 'Translation of existing media sources –including graphics, moving images, sounds shapes, spaces and texts– into numerical data accessible by computers'. What Manovich aims to emphasize in this brief description would help us to formulate a semantic discourse on the nature and background of digital objects and virtual environments as the outcomes of a cumulative genealogy. However, considering how rapidly the information technologies develop and spread worldwide, the need for an updated and expanded description persists to exist constantly. First of all, it would now be considered as a limited explanation to mention New Media only as a translation of existing sources, since a new cultural layer of global information networks seems to be established and it is capable of producing its own products and paradigm sets without solid linkages to material signifiers. This argument should not be interpreted as "new media objects do not have referential links to already existing systems" but should assist us to comprehend this new layer of existence as an internally consistent and coherent system of production, interaction and consumption. New media products are now capable of being produced by the means and tools of new media appliances; by using the methods and interaction styles that are employed by the system; and within this very system in which all these elements exist separately. "What you do in your computer stays in the computer!" seems to be a quite reasonable expression for an average IT user. Gürşimşek (2006: 90) proposes an updated description with reference to Manovich's as *'Creation, storage, classification, accessibility, manipulation and distribution of binary-coded media objects through pre-programmed algorithms'* to include further features and processes of contemporary New Media.

Considering the improvement of cyberspace (and information networks), computerized new media applications and the digital object as contemporary stages of modern ontological classification, we may attempt to examine the essential features and characteristics of these conceptual fields with regard to their evolutionary patterns and connotative values that are employed during the process. Therefore, I will focus on the methods of reproducing and/or representing the virtual objects; interaction styles and roles of participants in interactive product systems; and social reflections of these phenomena on conventional design, production and consumption theories to understand the patterns of progression in their semantic conditions.

Principles of New Media

As we have an updated description of what new media is with reference to Manovich's statements, an investigation of the essential principles and characteristics of his New Media

debate is necessary to build a solid discourse on. As outlined in Gürşimşek (2006: 91), these principles are stated in Manovich (2001: 27-49) as following:

• **Digital Representation:** new media is fed by binary coded visual information, whether these materials are created inside the media system or converted from analog media. By numerical representation, new media objects become programmable. Input is sampled and quantified to transform the data to a comprehendible format by the medium.

• **Modularity:** This is referred as the fractal structure of new media object. Unlike the modularity in the product design, this modularity may contain contextually irrelevant pieces of objects to create a meaningful whole because all elements may still remain their individual identities. These elements are also composed of digital objects (pixels, polygons, NURBS, etc) so the context may change although the object keeps its originality.

• **Automation:** This principle mainly aims to reduce the need for constant human control over interfaces. This is a low-level automation compared to Artificial Intelligence concept. Generation of responses in computer games according to certain behaviors of players may be considered as an example to automation of HCI over the software.

• **Variability:** This principle is mainly associated by the first two and is also thought to correspond with the "postindustrial logic of production on demand and just in time delivery". The concept of variability also comes with *"customization"*, which defines the logic of our post-industrial society. Customized interfaces or smart HCI modules should not be thought separately from the expectations of modern consumers. This may provide key clues about how new media and popular culture are associated, and how one drives the other mutually.

• **Transcoding:** The computer has to represent the information in its own specific way and the user can also access to the material in this specific method. All cultural data must be "computerized" to be in the field of new media.

In the light of these statements on the nature and structure of new media, the formation of a comprehensive discourse on object-consumption relationship in this context becomes more feasible. What is noticeable in Manovich's theory is that the new media is a structurally autonomous system which has its own functional associations and methods to create entities. However, it will also be discussed in the next chapter that a requirement for references to existing functional associations and metaphorical relations still maintains to exist. Therefore, an extensive design research study should investigate the genealogy of new media with reference to both conventional ontological classification and its promising new paradigms.

Visualization of the Virtual Object

Even though we mentioned the *"new object"* as an original and exclusive type of existence, it would be unreasonable to claim that it has no reference to previous conventional models whatsoever. Within a broader perspective, it is evident that the interaction between the subject and object is a mutual progress. While the *subject* (the user, spectator) monitors or interacts with the *object* (the product, system, world) through a *medium* (sense, screen, interface), the object reveals itself as an *image* that is appropriate to the conventions of the specified medium. The quality of the image affects the perception and consequently improves (modifies) the expectations of the subject; thus results in a continuous processing of the medium which is based on upgrading the means of preceding mediums.

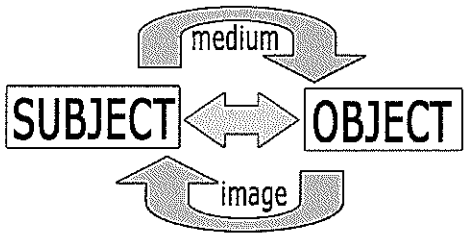


Figure 1

The cumulative development in the formation of an authentic language for the new media is frequently nourished by re-interpretation or adaptation of the existing conventions to the new environment. This may be mentioned as one of the major reasons of why we still have the symbols of "My Computer" on our "Desktop" in MS Windows©, or how we are using (almost) identical versions of usual VCRs to launch digital media documents. Given that the representations of material objects

are still employed in contemporary digital media, we can argue that the need for formal resemblances and references are essential for the users of the new medium to metaphorize this new existence and recognize it as a new cultural layer. Only after this new paradigm is socially comprehended, its genuine language becomes the primary motive why *'our memory technologies tend to define the very way we metaphorize our lives'* as Brody (1999: 139) states.

The roots of this representational phase in the development of a new language may be observed not only through objects but also through spaces and environments within New Media. Mitchell (1999: 116) focuses on the setting and conditioning of the Cyberspace locations in the earlier versions of information networks and points out how they were arranged to resemble the primitive urban settlements. It is noticeable that the virtual locations are categorized and identified according to their themes or contents within the network and particular interactive search engines are involved to assist the users to find their way inside the system on their own. Significant categories are classified and designed in a way that an average user may satisfy specific needs effectively; such as information sources, chat spaces, leisure areas or business sites inside the network.

The nature of these conceptual, visual or functional indications may either be interpreted as consequences of postmodern notions *'parody'* and *'pastiche'* as outlined by Fredric Jameson (1982: 114); or as a matter of *'persistence'* within conventional spatial metaphors employed by Cyberspace with reference to Mitchell (1999: 126). In every respect, it is visible that some sort of psychological attachment in the virtual environment to its material existence has been required by the users to start a definitive/perceptive process. What causes a person to intuitively act as if she's in a tangible environment within Cyberspace has usually been these spatial metaphors and representations of the *"real world"* as interaction tools or components.

The critical aspect of the subject matter, for both software and product design fields, is the fact that various professions and research fields are now participants of this complex and intricate context. The paradigm sets of each field are visible within a common medium. With the involvement of interactive technologies in end-user products and of metaphorical references to physical product systems in user interfaces, the extensions of creative professions have widened to utilize different perspectives. Not only are the classifications of objects and forms a new subject of discourse, but also the roles of participants and their identities have new expansions for contemporary design research.

Identifying the User

> (...) The spectacle's externality with respect to the acting subject is demonstrated by the fact that the individual's own gestures are no longer his own, but rather those of someone else who represents them to him. The spectator feels at home nowhere, for the spectacle is everywhere (Debord, 1994: 10).

The discourse on the identity of the *user* in product design -and as its counterpart, of the *spectator* in visual media- has its reflections in the psychoanalytical and social theories. As in Lacanian terms, an individual's self realization requires an image of "the other", a mirror stage that the infant may observe himself as "the other"; and ultimately an external figure which fulfills the unity of the symbolic order of reality. Thus, we position our own existence consistent with how we metaphorize this order, looking from outside towards how we would like to be included (Žižek, 1992). Given that contemporary visual media provides us with images of external reality by the use of it own means, we may take the discourse on *identity* one step further, by including interactive media. Subsequent to written text, the invention of photography (as a method of instantaneous still imaging) and cinematography (by capturing and presenting movement-image) were both breakthroughs in the progression of society's visual regime. It is a common topic of discourse that our perception of reality shifted towards photographic images; and then to cinematic intervals (time captures). Now, with the interactive media reorganizing our mental models by spatializing time-images within an information network structure and providing us a virtual autonomy inside, an individual can actually look through the eyes of the other. Moreover, he can control the actions of this imaginary-other to manipulate the whole *reality-setting*. Manovich points out this phenomenon by suggesting an updated version of Althusser's concept "interpellation" and stating: *'The cultural technologies of an industrial society*

-cinema and fashion- asked us to identify with someone else's bodily image. Inter¬active media ask us to identify with someone else's mental structure' (Manovich, 2001: 61).

As mentioned above, the freedom of the user and the level of her control over the interactive medium is a limited and virtual form of autonomy. For Mitchell, one major reason of this limitation is the system's requirement for "persistence", or the stability of the system's key features and its final condition whenever the user needs the same utility from the product. To provide a certain loyalty to the virtual product or environment by the user, a similar type of psychological attachment to the material product is needed by the software, as well. The ability of interactive systems to afford customization and personalization proposes a whole new role the user, a partial and restricted authorship that allows her to manipulate particular features of the virtual object or the interactive elements of a physical product.

Another significant method of creating psychological attachment to the virtual environment or system is by creating metaphorical, symbolic and/or arbitrary representations of the user as designated personas, avatars, etc. Given that this secondary character (the *imaginary other*) is a part of the system, the limitations and restrictions of his actions are legitimized since the user –subconsciously and voluntarily- assigns his representational persona to operate for himself inside the virtual environment. This is a similar kind of legitimization which may be argued within physical tools and material products; however the virtual objects' function is generally representational and based on conveyance of information more than being a physical body extension (Anders, 1999: 73). At this point, we may consider the mouse cursor (the arrow) that is generally employed in user interfaces as a clear example of metaphorical electronic body extension; as its main function is to aim (point) and shoot (click) at the specified virtual object. The cursor on the screen is the user's representational self to which he assigns a definite amount of authority inside the system. What's more, the cursor is a noteworthy example of another particular debate; the construction of an original language for the new media, the connotations of which exceeded the primitive metaphorical references and formal resemblances to corresponding material signifiers.

In the title of his foreword to Peter Anders' book *Envisioning Cyberspace*, William Mitchell asks an important question: 'Who Put the Space in Cyberspace?' (Mitchell, 1999: x) – A question that criticizes the way we define this new environment with metaphors and conventional references between existing mediums. With a careful observation, one can notice a significant paradigm shift in visual culture: the shift from planar perception that is based on the culture of the screen (or painting and, then, photography as its ancestors) to a spatial autonomy that is introduced with the development of interactive systems and the global information networks. As Anders argues in his book with reference to Mitchell, we should consider this spatial recognition as a medium, not as another metaphor (Anders, 1999: 74); all the representational figures and structures would be shaped within this new model. Taking this paradigm shift into account as a strong motive of cultural transformation, we may propose a discourse on the restructured identity of the user as a co-author of the mechanism; and consequently, on the definition of consuming the virtual object as a re-production process.

Consumption of the Virtual Product

Aside from its conventional definition as the utilization of economic goods (sources, materials, services) to satisfy needs, modern consumption is assumed to have wider connotative values. The consumption habits of the modern society are shaped not only by primitive physical requirements but also by the means of symbolic exchange and a social system of ideological values.

> Enjoyment is enjoyment for one's own benefit, but consuming is something one never does alone (this is the illusion of the consumer, meticulously sustained by the whole of the ideological discourse on consumption). One enters, rather into a generalized system of exchange and production of coded values where, in spite of themselves, all consumers are involved with all others (Baudrillard, 1996: 78).

For the modern individual, consumption of utilities is a method of constructing a certain sense of identity; what's more, it is also a way to express this identity within the social system of coded values. As stated by Bocock (1993), consumers specify

their utilities within paradigm sets that are comprehensible by others to differentiate their individual identities. Thus, a generalized system of symbolic exchange is required for the consumers to participate and communicate through utilities.

Virtual communities and –as a broader set– Cyberspace are economic utilities, too. Moreover, they provide their participants with wider and more heterogeneous platforms to express themselves and offer them new grounds to consume within. What is relatively more abstract and theoretical in post-modernist consumption model is apparently manifested in New Media theory – the shift from ownership to participation, and from consumership to co-authorship. This is to say, by launching and using software, surfing through world-wide web or downloading a document, an individual initiates a genuine cycle of utilization, consumption and reproduction through virtual artifacts.

Considering the fundamental component of these artifacts –the electronic signal– we may state that new media objects are essentially variable and infinitely reproducible. The limitations of variability and customization are dependant not only on the means of technical reproduction but also on the range of possibilities the designer prefers to offer to the user. Modern software applications are able to modify their system features including user preferences, language modes, intensity of details, visual/functional complexities and behaviors of the interface on specific actions of the users. For instance, contemporary web pages and computer games can be programmed to contain alternative file sizes and detail levels by analyzing the connection speed, CPU power or the abilities of the users (Gürşimşek, 2006: 95). The existence of such extensive possibilities to customize, personalize and manipulate the structure of the systems would present new responsibilities and roles to the consumer, too. While the interface or the virtual environment allows its consumers or participants to modify the system elements and features, there ought to be regulations or distinctive tasks for users to sustain an essential feature, as what Mitchell calls "*persistence*" of the virtual environment. He mentions the primitive versions and the development of MUDs (Multi-user Domains) and MOOs (MUD Object-oriented) to point out how the reinterpreted concepts of property and ownership in Cyberspace maintain the enforcement of conventions and persistence (Mitchell, 1999: 126). It is evident within this crucial statement that the construction of symbolic exchange in virtual environments may lead us to refer to them as new domains of modern consumer culture.

However, one fundamental distinction of digital artifacts obliges us to revise our conventional theories on the relations between "object and consumption". As mentioned above, the digital objects and systems are built on binary coded algorithms and transcoding of existing analogous sources to electronic signals. Therefore, the possession and consumption of these objects require the process of digital reproduction; such as *downloading* a document indicates creating an identical copy to your personal computer. Unnoticed by the average user, the system downloads web-pages while surfing through internet, creates temporary files to preview a picture or a text file, and constantly operates its memory to create backups for sustaining the system's persistence. By all means, the consumption system of new media depends on a consistent process of reproduction and re-distribution. Thus, if we could say –by revisiting W. Benjamin's inspiring essay on "The Work of Art in the Age of Mechanical Reproduction"- that '*the presence of the original is the prerequisite to the concept of authenticity*' (Benjamin, 1997: 125), we would notice that this is an era in which the need for the original is subdued by the existence of the hyper-real. The process of reproducing the representations of the "*original*" had shifted our paradigms on object, production and consumption socially.

Based on this hidden dependency of interfaces and virtual mediums, the borders between conventional definitions of producer (designer, author) and consumer (user) becomes blurry. Most users are now capable of downloading or creating documents, modifying their visual, formal or structural elements; and ultimately, redistributing them through information networks or a variety of mobile devices. Contemporary software tends to include more and more personalization options, filters, plug-ins or updates everyday. Even task-specialized applications (image and video editing, web design, document sharing, office software, etc.) are now designed for the average user to comprehend and use with minimum effort and proficiency. Ultimately, the modern consumer culture of hyper-reality defines its own consumers as both the target and origin of its own presence.

Conclusion

As outlined in this text, a new culture of hyper-reality has emerged with the introduction of interactive media and virtual environments as utilities of social consumption. This new cultural layer is formed upon the conceptual processes of reproduction, utilization and consumption of the images (representations) of physical reality as they are transposed to a new context and associated with each other through exclusive interaction patterns of new media. Consequent to the developments in information technologies and the growing involvement of interactive product systems in product design market as "consumer electronics", the conventional paradigms of design profession and design research would require a structural renovation to consider its contemporary expansions. The emergence of such terms as *ambient intelligence*, *end-user programming and system design* within design terminology shows us that this paradigm shift is already leading the field to a more complex and interdisciplinary state.

The conventional concepts of design knowledge and design tools became new materials for the designer, ever since the consumers ought to be equipped with the freedom of customizing, modifying and, what's more, *creating* their consumption utilities. On the other hand, the responsibility of constructing a persistent and effective product system is still burdened with the designer as he is the most active medium between technology and its users. At this point, referring to the outcomes of professional design act as "product systems" seems reasonable; in view of the fact that dominant motivation of contemporary design field is to create and manage life-styles through object systems rather than to produce and trade individually designed artifacts. Only through their incorporation with cultural system of symbolic exchange, the improvements in information technologies and social communication media may shape cultural conventions. The reflections of such a mutual relationship may be observed through a critical analysis of the developments in contemporary new media; With standardization of digital data formats, introduction of global information networks, establishment of structural and formal internal networks between consumer products and emergence of mobilized communication devices, the main concern of modern design culture is shaped within the integration of information and interaction technologies to daily-life effectively.

Since digital media has a standard structural language – binary coded algorithms- and shared platforms to function within –programming languages, operating systems and user interfaces- the possibilities of customization and personalization are determined mostly by the efficient usage of these sources. Although these possibilities are implied to the consumers as a form of autonomy, the management of virtual environments and on-line communities has already turned out to be a profitable market for global commerce. With constant tracking of users' certain actions and behaviors, consumption habits, system performances and even geographical locations, on-line corporations may offer user-specific functions, visual languages, messages, and cognitive/ subliminal advertisements that imply the idea of their individual sovereignty on-line.

Ultimately, modern society is progressing through the domination of a new cultural paradigm – a world of countless individual consumers living inside a simulacrum of ideological *Global Village* (Žižek, 2002) who perceive the external reality as a physical form of information architecture. What is critical for design research of the Cyberspace Era is to determine its fundamental position within the emerging cultural formation, develop original definitions and connotations for this promising specialized context to help build the authentic language of new media.

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SUSTAINABLE FASHION

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Abstract (Soft Furniture)

The focus of this paper is sustainability in furniture design. This paper proposes a framework to define sustainability in furniture design in terms of both physical attributes and cultural attributes. Whereas the physical attributes of sustainability in furniture already have been studied extensively by manufactures and designers, fewer studies have been done for cultural attributes. A product can be physically sustainable, made of environmentally friendly materials; however, if the product goes out of fashion very quickly, it is not a culturally sustainable product. Therefore, cultural sustainability is proposed to provide a more accurate framework for making more precise measurements in sustainable design.

In addition, this paper also attempts to discuss the relationship between fashion and sustainability within the perimeter of furniture design. Can we design a piece of furniture which is both fashionable and sustainable? As first glance, fashion is just the opposite of sustainability, because the glamour of fashion fades quickly. Nevertheless, by hybridizing fashion and sustainability, this paper attempts to evoke discussions about the cultural aspect of sustainability in furniture design.

Furthermore, a design model, given the name "Soft Furniture" by the author, is created to illustrate the congruence of sustainability and fashion in furniture design.

Introduction:

Design is creative solutions for problems; however, it sometimes creates new problems. The Industrial Revolution made peoples' lives more convenient and comfortable but also put billions of pounds of toxic materials into the air, water and soil. New problems need new solutions. In the midst of the severe damage and degradation in the living environment, people begin to question how we can sustain our lives and activities, as well as maintain a clean planet.

The focus of this paper is sustainability in furniture design. Means of measuring sustainability in furniture design need to be devised. The development in product life cycle assessment (LCA) permits the analysis of the environmental effects of a product. However, LCA methodologies do have significant limitations in terms of their relationship to creative practice (Walker, 1995). The physical lifespan of a product, an important measure for LCA, can be inaccurate. For instance, pieces of furniture can be very sturdy and stay functionally useful for fifty years, but many end up on curbs or in junk yards before their physical life is over. In order to precisely measure the environmental impact of a piece of furniture, this paper proposes a framework to define sustainability in furniture design in terms of both physical attributes and cultural attributes. The author defines physical attributes as characteristics related to physical existence, such as material, shape, colour and texture. Cultural attributes, in contrast, are characteristics related to emotion, aesthetics, artistic and cultural value. Cultural attributes do not physically exist; however, they are inherent in products and should be evaluated. Subsequently, to answer the question "How can a piece of furniture be both physically sustainable and culturally sustainable?" a design model is created. The essence of this model is to employ sustainable fabrics as a major structural component in furniture to enhance the aesthetic and visual experience, to conserve resources such as the wood, glass and metal products that are used for current furniture manufacturing, and finally to attach individuality to mass produced products.

Review of Literature

As described by William McDonough, design today is following a linear, cradle to grave model (McDonough & Braungart, 2002). He suggests, "The waste pollution, crude products, and other negative effects that we have described are not the result of corporations doing something morally wrong, they are the consequence of outdated and unintelligent design." His solution for this dead end is "c2c" (c2c Task Force Proposal, n.d., 2005)[1], a new design paradigms, which turns industrial waste into "technical nutrients". He also calls it "waste equals food". William McDonough has hoped not only to eliminate waste, but to eliminate the entire concept of waste.

In product producing industry, the environmental focus has shifted from the manufacturing processes to the products themselves, as they are accountable for all the environmental impacts from all life cycle phases (Alting, Hauschild & Wenzel). Life Cycle Assessment (LCA) can be performed during the product development to determine the environmental impact. Performing an LCA is a time consuming task. Many factors need to be defined and measured, including components, energy use, work hours, transportation, disposal scenario, and product life. As a result, LCA provides more accurate measurement for environmental impact and allows consumers to make decisions based on environmental consideration.

There are many theories that allow designers and the general public to make intelligent decisions that are beneficial to the environment. However, many designers and the general public are still following previously established ways of thinking in their practices and daily lives. Those manners of behaving, doing and making were developed due to the complexity of human needs. For example, one might be convinced that sustainability is an important issue, but when it comes to buying a vehicle, one still prefers a Hummer. Research on consumption and sustainable development shows that the consumption patterns of extravagancy and wastefulness are deeply entrenched in most societies and cultures. In order to surmount environmental problems, we need to reduce consumption (Myers, 1997).

Therefore, producing environmentally friendly products alone is not enough. According to Ryan (2002), "Even when designers follow sustainable parameters, sustainable production and products cannot exist without sustainable consumption".[2] Designers should also be concerned about how consumers use the products in order to eliminate unnecessary waste. The market is driven by both designers and consumers. Research shows that the consumption pattern has changed. What do people like today? According to Kotler (1989), the concept of "mass market" is dead, and market segmentation has progressed to the era of mass customization. The growing interest in mass customization has led researchers to believe that firms that shift from mass production to the emerging paradigm of mass customization will gain a competitive advantage (Kotha, 1996). The consumption pattern shows the growing interest in individualized products. Designers with environmental consciousness responded to this growing interest and created individualized garments, jewelries and bags from recycled materials. For example, Rebecca Earley, a London based textile designer, is exploring the benefits of using recycled synthetics to create eco fashion (http://www.beckyearley.com/). Her concept of an updatable garment is about a switch in emphasis: from one garment to many garments; from passive consumers to active users; from a single snapshot in time to an on-going movie. The active involvement of consumers has made sustainable design a collaborative effort.

The role of art has further complicated the issue of ecological crisis. Without art, ephemeral culture could not endlessly refuel its production with newer goods, trendier products, and fresher images. Commercialized art stimulates consumers to always desire more (Luke, 1992). Some may argue that designers who provide consumers with goods that cause pollution should be held responsible for the manner in which people are consuming today (Datschefski, 2001). It can also be argued that designers who provide consumers with the mindless trend which encourages the extravagant consumption should also be held responsible for the current ecological crisis.

[1] c2c Task Force Proposal: Endorsing the Cradle to Cradle Design Paradigm [Presentation]. (n.d.). (2005). Savannah: IDEC

[2] Quote by professor Chris Ryan, Bsc, PhD (Melbourne), Director of Ecodesign Australia

Sustainability in Furniture Design

The focus of this paper is sustainability in furniture design. In the summer of 2005, Chicago Furniture Designers' Association (CFDA) had a major show based on a definition that sustainable furniture, "in its idea form, can be produced continuously into the future without exhausting the resources of which it is made or degrading the environment we live in. "This definition of sustainable furniture is very broad. Previous research has suggested that sustainability in furniture design includes some of the following categories: the process of making furniture is less toxic; the materials used to make furniture are recycled, recyclable, decomposable or renewable; the furniture can be easily dismantled and recycled; the production of furniture uses the least amount of materials for the most performance; after its lifecycle, components of the furniture can be easily refurbished or reused; and so on.

Nevertheless, most previous research has focused on the physical attributes while overlooking the cultural attributes of the furniture. How does a piece of furniture perform in our culture? What is the inherent artistic and cultural value? Although cultural attributes do not physically exist; they are important factors for determining how long a piece of furniture will sustain in our culture; consequently, the product life. Without considering the cultural attributes inherent in product, the measurement of Life Cycle Assessment (LCA) can be inaccurate. A product can be physically sustainable, made of environmentally friendly materials; however, if the product goes out of fashion very quickly, it is not a culturally sustainable product. Due to strong consumerism and promotions from business, many products today are not culturally sustainable. The following question needs to be answered: How to design a piece of furniture that sustains in our culture without using precious material like rosewood?

Creative Application

Furniture is an indispensable part of human existence. The function of furniture is to fulfill both the physical needs and the aesthetic needs of human beings. However, mass produced furniture, especially low end furniture, has focused predominately on physical function, whereas the cultural value of furniture has been less important.

Sustainable design is a notion of complexity. It may involve many aspects in the chain of production and consumption, including material extraction, energy consumption, transportation, product life, toxic gas emission, disposal, recycling, and many more. Therefore, there are many solutions to achieve sustainability. This paper only provides one tentative approach, a design concept which the author calls "Soft Furniture."

Inspired by eastern aesthetics and sustainability, the concept of using fabrics innovatively as a major component in furniture is developed to integrate furniture and fashion in order to create a unique characteristic for each piece of furniture and allow furniture to make a fashion statement in the interior environment. Soft Furniture employs sustainable fabrics together with frames made of recycled and recyclable materials. The sustainable fabrics substitute for heavy MDF (Medium Density Fiber) boards, wooden door panels and side panels, and molded foam, and so lighten the massive feeling as well as reduce the amount of raw materials used for each piece of furniture. Soft Furniture employs frames as "skeletons" and fabrics as "dresses", which allows the components of "Soft Furniture" to be easily separated, conveniently dismantled, efficiently sorted, and consequently to be returned back to the raw materials (Figure 1, 2 & 3). It also provides flexibility for users to buy different "dresses" according to their disposition and taste, and to change dresses for different occasions and moods. In addition, given the physical attributes of fabrics, "Soft Furniture" can create more complex forms and shapes than rigid traditional furniture (Figure 4).

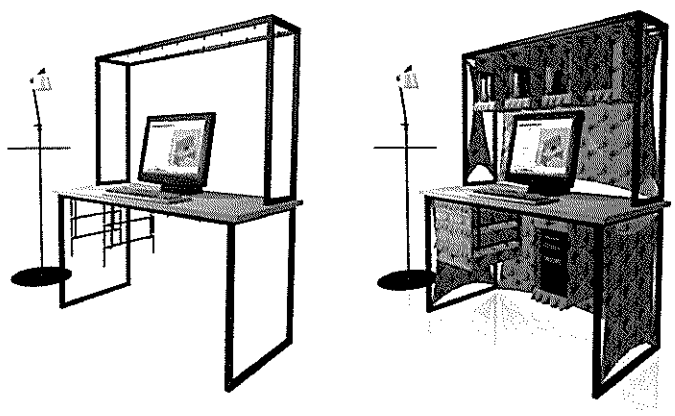


Figure 1. "Skeleton" and "Dress" system

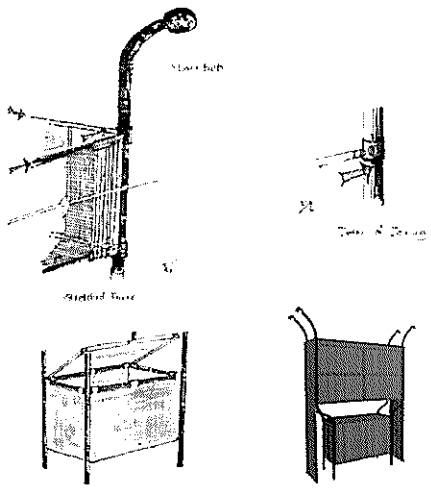


Figure 2. Myosotis – Assembly process



Figure 3. Computer desk - Assembly process and details

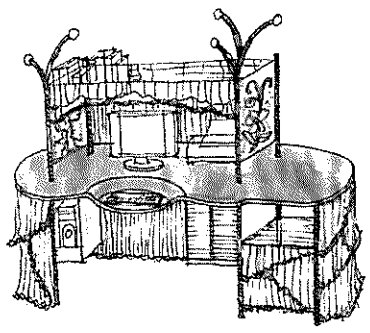


Figure 4. Oriental Dream - Computer desk with tree-look lighting fixture

The easily recyclable "skeleton" and "dress" system also allows manufacturers to rent the furniture to customers for as long as they may need, and then to reuse the materials for new products. In this way, the materials are kept in the "technical cycle" and become technical nutrients for future production (McDonough & Braungart, 2002). This rental scheme may help the manufacturers to produce low cost sustainable furniture.

In recent years, the domains of fashion, architecture and furniture have converged in many ways. Architecture is making its presence felt in cutting-edge fashion; as a result, the wearable 'dwellings' are able to act as both shelter and clothing (Quinn, 2003). Fashion designer Hüseyin Çaglayan has made an attempt to unify fashion and furniture in a series of dress design (see Figure 5). However, there haven't been many attempts in uniting fashion and furniture from furniture designers' approach. Fabrics have long been used in furniture and interior decoration; however, the usage of fabrics to a large extent is confined to certain areas such as draperies, curtains, and upholsteries. Foldable, lightweight furniture often employs canvas as a structural component (Hennessey & Papanek, 1973); nevertheless, the canvas is to fulfill the functional needs rather than aesthetic needs. The innovative employment of fabric in Soft Furniture attempts to create a unique dialogue between fashion and furniture, and fulfil consumers' aesthetic needs.



Figure 5.

A product can be physically sustainable or culturally sustainable. Soft Furniture strives to fulfill both. The main goal of Soft Furniture is to enhance the aesthetic and visual experience, as well as to conserve resources such as the wood, glass and metal products that are used for furniture manufacture. The supplementary goal of Soft Furniture is to be lighter, foldable and able to adapt to the rapidly changing fashion trends.

As a physical product, Soft Furniture is a hybridization of both the Western sustainable theories and Eastern aesthetics. From the technical point of view, Soft Furniture was influenced by "eco-efficiency" (World Business Council for Sustainable Design) and "waste equals food" (McDonough & Braungart, 2002). Soft Furniture will be built entirely of fabrics with frames of recycled and recyclable materials, to address the issue that most furniture today is designed on a linear, one-way cradle to grave model (McDonough & Braungart, 2002). From the aesthetic point of view, the concept of Soft Furniture was influenced by the ancient Chinese (Figure 6). Although Chinese silk screens are created with only silk paintings, rice paper, and wooden frames, they can produce an impressive variety and complexity of forms; in addition, the function of silk screens is versatile and flexible.

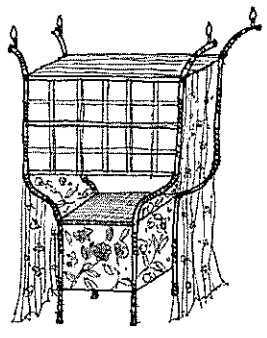


Figure 6. Myosotis – Design is influenced by Chinese aesthetics

As a cultural product, Soft Furniture is a hybridization of furniture and fashion; it acquires a broader meaning and allows people to express their identity. Teenage boys may chose different "clothing" for their computer desks than teenage girls. In this sense, Soft Furniture is endowed with personal qualities, which can express owners' tastes more explicitly than conventional furniture (Figure 7 & Figure B). In addition, being composed of two independent parts (the fabric and the frame), Soft Furniture fulfills the needs of strong consumerism while extending the lifespan of the frame to the functional limit, thereby insuring cultural sustainability.

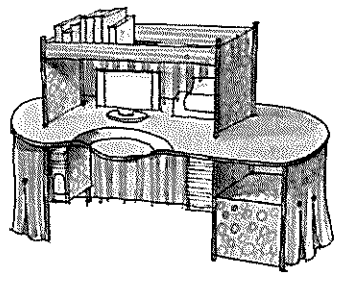


Figure 7. Office Lady - Computer desk in formal business suit

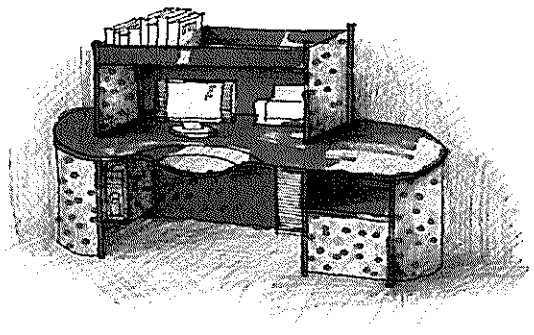


Figure B. Summer Beach - Computer desk in casual dress

The taste of consumers will continue to change. It may not be easy to convince someone to not buy new garments or to keep the outmoded furniture for the sake of sustainability. Therefore, it is the designers' responsibility to design culturally sustainable products that are more adaptable to the ever-changing taste of consumers.

Discussion

Products promoting the individualism may have the potential to become consumer favourites. Soft Furniture may attract attention from various consumers by reinforcing individualism. By responding to the transformation of consumption pattern from mass production to mass customization, Soft Furniture allows consumers to be involved actively in the process of making. For example, a computer desk specially tailored

for teenage girls may enhance the existing perception of the computer desk beyond that of a functional commodity, particularly if a girl can individualize it herself by buying different apparels (see Figure 9).



Figure 9. Sailboat – Computer desk

The marketing and cultural aspects of Soft Furniture may be analogous to the Barbie doll, which has remained popular in American culture for over 50 years. As Barbie offers a wardrobe of stylish dresses, so Soft Furniture may keep consumers' interests by offering them a wardrobe of apparel for furniture. The style of Soft Furniture's apparel also can be guided by the fashion industry, thus encouraging consumer interest, and stimulating marketing demand. Those interested in fashion have the option of a multitude of designs. In the same way that young girls can vary Barbie's attire, consumers can vary the décor of their Soft Furniture for the occasion, from a formal dinner with one's employer, to the informal meal with friends. In many ways, Soft Furniture may not be a genuinely new concept, but an old concept applied in a new way to furniture.

Summary

Soft Furniture seeks to incorporate environmental and cultural sustainability, fashion, individual taste, and mobility into a marketable product. The analysis of sustainability in products as well as in culture has not been completed. Future investigation on environmental sustainability, durability, potential markets and materials for the frames and recyclable fabrics is suggested.

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CONTROLLED DISORDER: MENTAL IMAGERY AND EXTERNAL REPRESENTATION IN THE CREATIVE DESIGN PROCESS

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Abstract

Aiming to investigate creativity in education, a comprehensive course has been adopted and attention has been drawn to the importance of various techniques to investigate the dynamics within the creative process. The dual relationship in which one accidental and one deliberate process exists within a single creative process, has taken on several names, such as, unstructured-structured, divergent-convergent, or vertical-lateral. This type of "controlled disorder" exists within the five stages of a creative process -Readiness, Reception, Reflection, Revelation, Recreation (5R's)- of the Sensational Thinking model of O'Neill and Shallcross. "Mental imagery" and "external representation" provide valuable insight into the mystery of the creative design process that has been known to be a chaotic and unstructured one. This investigation dwells mainly upon the methodology to tackle the difficult and at times disorderly topic of creativity that can be reached through a thorough understanding of the creative process for means of boosting it within designers' environments. Thus, a selection of interconnected studies that dwell on the role of imagery and externalization within the stages of the creative process, operationalizing and assessing creativity in design, and connections with the social and physical environments which it takes place in will be discussed.

Keywords: creativity, creative design process, vertical and lateral thinking, mental imagery, external representation

Introduction

The creative process has been seen as a syndrome, or a black box that miraculously produces original results (Jones, 1992). However, leaving the subject as a mystery prevents its utilization as a tool. *Disorder* is key for creative outcomes (Boden, 1995), but it cannot answer problems in a useful way if it is not guided (Robinson, 2003). *Mental imagery* and *external representation* play significant roles among stages of the creative process (Daniels-McGhee and Davis, 1994). Imagery involves the formation of an individual subset of unique ideas that are both involuntary and controlled sources of novel interpretations derived from a larger domain (Simonton, 2003).

External representations are significant contributors of the creative process, and take on many forms, such as drawing, scribbling, taking notes, as a consequence of an imagery period (Dahl et al., 1998; Daniels-McGhee and Davis, 1994; Lubart, 2001; Plsek, 1997). Although there has been a great deal of research done on creativity Guilford, 1968; Feldhusen, 1993; Isaksen et al. (1993a, 1993b), Jones (1993), very few approach the subject from all aspects, leaving many unanswered questions behind (Isaksen et al., 1993b; Bailin, 1994; O'Neill and Shallcross, 1994; Candy and Edmonds, 1999; Cropley, 1999). This study uses a multitude of different methods and a combination of various techniques suggested by previous research (Mooney (1963), Isaksen et al. (1993a, 1993b), Jones (1993).

Previous research shows a concentration on evaluating the creative thinking process in education (Guilford, 1968, Haensly & Torrance, 1990); the effects of the environment on students' academic performance and the quality of the learning environment (Lackney,1994; Livingstone & Nelson, 1994; Moore & Lackney, 1994), or specific aspects of creativity such as, reading ability or academic performance (Verstijnen et al., 1998; Simonton, 2003; Kristensen, 2004). While specialized approaches contribute greatly to the topic, they may be restricted as it is quite difficult to achieve a complete picture of creativity. Aiming to investigate creativity in the design studio environment, this

study has adopted a holistic framework and drawn attention to the importance of superimposing different techniques of assessing creativity (Hasirci and Demirkan, 2003 and 2007). It is important to achieve a more comprehensive approach for future research in creativity, and the effects of the environment on it, for an understanding of the variables involved and to prevent over-simplification of the topic Isaksen et al. (1993a, 1993b).

The goals are to explore vertical and lateral thinking techniques and understanding the creative problem solving process in design, how the framework of the 4P's (person, process, product, press or environment (Mooney (1963), Rhodes (as cited in Firestien, 1993) necessary to define creativity wholly can be used to look at the creative "process" within which the creative "person" creates a creative "product" in a creative "press, context, or environment". Combining the 4P's and the 5R's proved to be a comprehensive model to be utilized for enhancing creativity in the design studio (Hasirci and Demirkan, 2007; Jones, 1992; O'Neill and Shallcross, 1994; Simonton, 2003).

This investigation focuses mainly on the methodology to tackle the difficult topic of assessing creativity, using the third year design studio at Bilkent University, Department of Interior Architecture and Environmental Design, and the first year design studio at Izmir University of Economics as settings. In design studios, students are eager to focus on their own design expressions at the expense of the users' needs. However, with a deliberate user-identification stage within the creative process, both can be accomplished. Within these stages, *user-identification* is a beneficial method that can aid in producing creative results that fulfill users' needs (Dahl, Chattopadhyay, and Gorn, 1998; Dorst and Cross, 2001; Mumford, et al. 1997).

In the design field, where there is a great deal of creativity involved and there are less boundaries regarding methods, it is even more difficult to understand the process that leads to a creative product. However, it is crucial to understand the creative decision-making process for the purpose of improving products both in education and practice (Purcell and Gero, 1998). It is significant, yet difficult to understand the cognitive process of creative decision-making that leads to creative results and products (Heerwagen, 2002). Although it is at least equally significant, the long time focus on the *product* has left the creative *process* in the shadow (Kokotovich and Purcell, 2000).

Creativity is not an uncontrolled issue, nor a fully controlled one. However, it is important to mention an interesting fact about the relationship between creativity and knowledge. The remarkable drawback about knowledge is that, knowledge and creativity have a bell-curve relationship, that is, having too little or too much knowledge hinders creativity (Cropley, 1999; Daniels-McGhee and Davis, 1994). However, to control just how much too little and too much one knows is difficult. The problem of being knowledgeable, yet creative is the point to be achieved. Picasso stated that, when he was a child he could draw like Raphael, but that it took him a lifetime to learn to draw simplistically and creatively like children (Gardner 1980). Therefore, to achieve the creativity factor in the style of young children, which is difficult to achieve after a certain age due to social rules and pressures, it is important to have a good understanding of the creative process and the methods involved (Dacey,1989).

Creative cognition and production take place in cycles and at certain periods in life (Candy and Edmonds, 1999; Eastman et al., 2001; Dacey, 1989). These cycles coincide with Csikszentmihalyi's (1996) tripartite understanding of creativity, composed of the 'field', 'domain', and 'individual' in a person's life. He asserts that a certain amount of expertise is to be possessed by the individual in order to be creative in a domain and enable evaluation according to the necessities of the field. That is, we show and assess creativity within a context of expectations in the society. Related to the use of knowledge, there is the issue of simultaneous existence of controlled and uncontrolled courses within a creative process. Order within a creative process is a socially acquired and learned topic (Ebert II, 1994; Finke, 1996).

Creativity as a way of operating

Children are often known for being unintentionally creative. Limited skill/information, and the assessment of creativity according to what is omitted rather than what is included, in certain contexts has been accepted for creativity itself (Runco, 1991). The *fourth grade slump*, 9-10 year-old losing their creativity due to social rules depends on this factor (Dacey, 1989). However, children do possess the skills for strategy and intention in problem-solving, yet it is not certain that they may use them at any given point within the creative process, thus

it is not controlled (Ericsson and Simon, 1993). Once the rules, signs, and symbols of society are learned, it is hard to think without them as they are also needed for communication (Robinson, 2003).

Today the idea of creativity as a quality that only the blessed few possessed has been left aside. The widely accepted view is of 'creativity as a process of the mind' (Robinson, 2003). Moreover, terms like, 'the designer as magician' are being replaced by the will to understand the complex process of design (Jones, 1992; Finke, 1996). Consistent with this idea, Akin (1984) stated that, the irrational creative process could be accounted for through purely rational processes. Although this is so, Finke (1996) concurred that, creativity is something that is neither fully structured nor unstructured. That is, deliberate as well as intuitive qualities are significant for creative results. Awareness of the process is critical at this point.

Apart from studies that have led to these widely acknowledged notions, other research concentrated on the differences of the 'perceptual functioning' among individuals. We all perceive the world differently due to our particular backgrounds, in addition to our psychological and physical abilities. Thus, we can say that, the perspective from which we look upon the world shapes our creativity. This perspective can be produced intentionally by adopting a creative 'perspective' or 'approach'. In this sense, it is a selective perception that develops sensitivity in the creativity area, and it can be enhanced by way of awareness and a purposeful tactic (Pereira, 1999).

Adopting a perspective as such is important for one reason in particular, and that is the fact that human beings perceive the world not only by seeing it but also by visual thinking. Besides, although the visual sense is the strongest, we can do the same with our remaining senses as well. Remembering the past and thinking about the future are actions that we carry out by visualizing them in our minds, and are incredibly important for a designer. The case of Beethoven being able to compose after he became deaf is an example of such ability.

As a result of these abilities, different types of 'products' are created. Thus, creativity requires something to be done in order to surface. If a person never learns to play the piano, s/he may not realize her or his gift for music. That is why providing different opportunities for human beings while growing up is important for developing those creative tendencies that may otherwise remain hidden. Following these products and evidences of creativity, comes the need to conform values of the society or culture. Although this is so, revolutionary ideas do not come along everyday, and this points to the significance of daily and ordinary creativity that people use throughout life (Robinson, 2003).

Another important factor is that creativity is not a particular finished occurrence, but a 'process'. Thus, finding one's domain of creativity is very important. It is not possible for a person to be creative in every single domain; usually creativity is channelled into a single route or field. One has to know enough of the field to make use of it, make judgments throughout the creative process, and evaluate what s/he has done. Self-assessment is also connected to the idea of *values* and that creativity should be assessed by experts of the field (Ericsson and Simon, 1993; Eysenck, 1996; Feldhusen and Goh, 1995).

The 'field', according to Csikszentmihalyi (1996), involves the social and cultural aspects in tasks, operations or jobs. That is, it defines the area and relies on the evaluation and judgments of the decision-makers, the knowledgeable, and the wise in that area. The 'domain' is the formal system of a body of knowledge and its codes, regulations, and operations. Creativity is partly a social construct and it relies heavily on the individual constructs of domains and fields that are shaped according to the values of the society. Therefore, creativity in children is excluded due to the belief that they have not yet achieved sufficient expertise in a particular field to be assessed by it or by the peers of it. Without a doubt, contextual assessment and evaluation according to a different set of norms is always necessary while working with creativity of different groups of people, and not only children (Beattie, 2000).

Controlled disorder

Research on creativity has often concentrated on relations of creativity with divergent thinking methods. However, due to the rigidity of what society expects of creativity, and the need for flexible communication among different fields, structures, and levels, both are vital for creative problem solving, and both necessitate knowledge of the literature, language, and

techniques of the main and supplementary fields involved (Pereira, 1999).

Vertical and lateral thinking techniques are not only two very different ways of thinking one uses in daily life, they also have an effect on structuring how one sees the world. Creative thinking in design mostly involves the unstructured way of thinking that has been called divergent, lateral, or lateral (Aydede and Guzeldere, 2005; De Bono, 1992; Suwa and Tversky, 1997; Suwa, Purcell, and Gero, 1998), and contrary to popular belief, is a skill that can be learned, practiced, and, improved.

	Vertical Thinking	Lateral Thinking
Basic Nature	• Controlled	• Disordered
	• Structured	• Unstructured
	• Convergent	• Divergent
	• Analytical	• Provocative
	• Sequential	• Non sequential
	• Logical	• Non Logical
Process	• Deliberate	• Accidental
	• Focuses on one path	• Collects information from the environment
	• Selective	• Generative
	• Converges toward acceptable solutions	• Seeks additional options
	• Use of negatives block certain paths	• Does not have to be correct to proceed
	• Follows most likely path	• Explores unlikely paths
Use of Patterns	• Retains, labels, names, categorizes, and classifies from past experience	• Attempts to escape from established patterns, labels, and classifications
Results	• Acceptable, appropriate	• May be objectionable
	• Finite	• Probabilistic
	• Predictable	• Unpredictable

Table 1. Comparison of the characteristics of vertical and lateral thinking techniques (De Bono, 1992).

Vertical and lateral thinking aid in making sense of the data collected by the brain by storing information in patterns, and selectively recognizing patterns according to these dominating established patterns, respectively. These features simplify the functions of the brain, however, they draw limiting frameworks on perceptual processes as well as creative thinking (De Bono, 1992).

Vertical thinking that is used extensively in daily life, and assumes a single correct answer to a problem. Students within an education system that is focused on test solving need this type of thinking in order to be successful. Having been educated in such a system throughout one's life makes it difficult to use divergent techniques. In an educational system focused on tests, it takes time to "shift gear" and adopt different ways of thinking that are necessary for solving design problems.

Lateral thinking, on the other hand, is the type of thinking mostly used in creative problem solving, and instead of a linear single answer way of thinking, it presupposes transitions between pre-established patterns. This process considers very different solutions to a problem and may create new patterns that are original, but not necessarily immediately appropriate in terms of the solution to a problem. Experience, experimenting, trial and error, and imagery are very frequently utilized in this type of thinking, and they enable a break from the tyranny of a strong idea, and provide original results that can be utilized. (Heerwagen, 2002; Dorst and Cross, 2001).

Vertical thinking is concerned with proving or developing concept patterns, while lateral thinking involves insightful restructuring of patterns and creative emergence of new ones. The need for lateral thinking arises from the limitations of the behavior of mind as a self-maximizing memory system. Creativity is often believed to be an unstructured spontaneous act happening at a random time, however, what society judges as creative has a very rigid framework. Techniques of "teaching" creativity all aim to make people solve problems by viewing them in different ways. While vertical methods allow movement only around the language and rules of a field, lateral ones enable intertextual relations among different fields allowing the emergence of associations never thought possible (Li, 1997). Although vertical thinking is the dominant mode in Western culture, both vertical and lateral techniques are necessary to

maximize creative problem solving (De Bono, 1992).

The third year design studio

One of the places creativity is most needed is environments of design education. This study analyzes the cognitive stages in the creative decision-making process during the act of designing. It also examines the connection between cognitive issues and tasks related to the third dimension of objects and spatial issues in interior architecture. The stages of the creative process are examined, exploring the creative design processes of third year students of the Department of Interior Architecture and Environmental Design at Bilkent University in Ankara, Turkey. During this procedure, the reinterpretation and formulation of the given task, and the activity of focusing on the user-identification phase were taken into consideration. The sample was comprised of 15 subjects who were selected by random sampling among 46. This study is primarily qualitative, but is supported greatly by quantitative data. Findings obtained through 'observation', 'product assessment', and 'protocol analysis' ('retrospective interview') are used in order to develop a model to enhance creativity (Hasirci and Demirkan, 2007).

The third year of university education can be considered as the completion of a learning cycle for the interior architecture students. When the students reach that stage, they have learned the discourse of design, formed a certain approach or style, and can clearly state them while or after dealing with a task. This would especially be compatible with the method of protocol analysis used while the students make creative decisions regarding the design problem given to them. Vertical and lateral techniques were used together in the solving of creative problems, as until the third year, the students have already acquired this skill. The vertical methods could be seen in actions such as, some students constantly asking the instructors for their opinions to check whether s/he was on the correct path or not, relying heavily on safe methods used and proven by famous designers and architects. However, these kinds of behavior were occasionally counterbalanced by lateral techniques such as, the use of intertextual associations between movies, books, or design solutions in other domains. The formation of a concept for the solution of the design problem necessitated this type of a relation from the start, enabling all students to use lateral techniques at each stage of the process and achieve more creative results.

The hypotheses to be tested were as such, 'There is a relationship between the type and quantity of representation, and creativity': Three-dimensional representations such as, perspectives and models were found to lead to higher creativity levels compared to two-dimensional depictions such as, layouts/ plans. Thus, more importance should be given to sketching, so that this significant skill of designers can fully develop in a way that enables the students to easily represent what they visualize in their minds. Finally, while verbalization during the design process and among classmates can be constructive, as also supported by Eastman et al. (2001), excessive reliance on verbalization in critiques appears to weaken the skill of sketching (Goldschmidt, 1992a and 1992b; Verstijnen et al., 1998).

'The creative quality/ characteristic of the decisions made can be increased by way of first understanding the creative process that involves cognitive components': Placing the creative process under the microscope was helpful in understanding preferred imagery and representation styles and quantity, time spent at different stages of the process, underdeveloped skills, behavior, in addition to student-student and student-instructor relations, and associations between creative processes and products. Understanding these relations can be helpful in developing the curriculum to aid the skills necessary to experience more creative processes conducive to produce more creative products in the design studio.

'There is a relationship between the observed creative traits and product creativity': This relationship can easily be seen in the observations. Those students who did not only work on their projects, but also spent time on asking others' opinions and discussing their projects were among the most creative ones. A constructive interaction between the students was observed to be helpful in developing their ideas. The students in each group completed the phases with similar timing and submitted the project almost simultaneously. The arrangement of the studio environment affected the behavior of the students, and three students mentioned becoming more motivated while working individually in a group arrangement of tables.

'There is a relationship between imagery and representation amounts and creativity': This assumption appears verified, in that, the students who have used more imagery were more creative [$\chi 2=24.75$, df=15, $p<0.05$]. Two of the most creative students used more than 70% imagery (highest percentage), and one of the least creative students used less than 30% imagery (lowest percentage). The relationship between creativity and imagery use seems to be not significantly independent (7 students stated that they used 70% imagery and 30% representation). Total creativity and imagery use were found to be highly correlated [correlation coefficient=0.623]. Total creativity of the product and imagery use in a project were also found to be highly correlated [correlation coefficient=0.584].

'A deliberately applied user-identification stage may improve the quality of design products': This in turn, may broaden designers' perspectives, and thus enhance creativity. The students who were found to be more creative in their products by the instructors declared that they visualized the space by identifying with the user or customer, and stated that this is the way they think when they are first introduced to a project. Both 'visualization' and 'identification' processes seem to have had useful outcomes in terms of creativity.

Most students thought that their studio-work deserved a higher grade than what they believed the instructors would give them. The 'instructors' grades' and the 'students' expected grades' were found to be significantly different [$t=4.63$, df=14, $p<0.00$]. A common response from the students to the question of the environmental features that would make the students work more efficiently and creatively, was, that it should be a more flexible environment on various levels. They believed that first, constraints related to time, due dates, and grades should be minimized. In addition, noise inside the studio has been mentioned a number of times as a factor that negatively influenced the design process. The students also mentioned a wish for inspiring posters, projects, pictures, and models on the walls and in the studio environment, in addition to a comfortable space within the studio with collection of design books and magazines that would help the students in their projects. This is consistent with the findings in countless research on the character and quality of the environment creativity is most likely to flourish (Kristensen, 2004).

Most students emphasized the importance of the process as well as the product. They stated that the emphasis is placed on the product and their efforts are not recognized if they cannot produce a successful product. However, the students may not be able to make use of the research that they carry out by representing the findings and inspiration sources on their projects, or not be able to express –visually or verbally- how they plan to use this new information. Both situations identify a lack of communication that has to be resolved in order to gain progress throughout the semester. Thus, it appears that the sketching and research techniques necessitate improvement.

The first year design studio

Following this study, using the same assessment forms but without the videotaping of the students' processes, a study was carried out with first year design studio students in the first semester of the 2006-2007 academic year in the design faculty of Izmir University of Economics (IEU). The aim was to observe the creative design process of students newly introduced to the design approach, and investigate any differences between students who had acquired a design language and the ones who had not.

In this studio, there was a total of 49 students from each department of the design faculty (equally distributed between the departments of Fashion Design, Industrial Design, Communication Design, Interior Architecture, and Architecture students). 25 students from the group were randomly selected from the studio for the retrospective questionnaires on their creative processes. The most creative projects selected by their instructors were chosen due to the initial selection of the household object by the student (in which there is recognition and insight as well as chance involved), the full understanding of the requirements of the project (nothing missing or incorrect), originality (for both the student and the society), interactivity of the toy, and workmanship, in addition to the creativity assessment criteria in the evaluation sheets. The project chosen for the study involved dismantling a household object and turning it into an interactive toy. The project lasted two weeks (a period of 16 studio hours), and the students were not allowed to take their projects home, so that all of their work could be observed in the studio. The students' design process and work were

assessed by the instructors using the creativity assessments sheets in the previous study.

The aim of this study was to analyze the creativity of students who were in their first year of design education, and investigate their own perception of handling the creative process. The same hypotheses were investigated, and the findings were in keeping with the previous study. However, the lack of a full understanding of the design process was obvious. Early introduction of lateral thinking techniques and the vague nature of the creative design process in the design studio is believed to be useful for more creative outcomes.

The first hypothesis was, 'There is a relationship between the type and quantity of representation and creativity': Three-dimensional representations such as, perspectives and models were not as refined as the third year studio, however, simple sketching and small scale models were again found to lead to higher creativity levels compared to two-dimensional depictions like top views, as students could not visualize all dimensions of the project. Thus, more importance should be given to the use of log-books, which were made part of the curriculum not only in the design studio, but also in a course on drawing and representation techniques. The students who kept log-books are good for sketches, scrap pieces of information on which they could extend their thoughts, and learn to build concepts were more creative. The skill of visualizing that is already not easy for the students and representing the visualized again became evident in this study.

'The creative quality/ characteristic of the decisions made can be increased by way of first understanding the creative process that involves cognitive components': The vertical and lateral thinking methods were also considered in the creative process, and should be integrated within the assessment of the 5R stages. A calculated technique of balancing vertical and lateral thinking can be integrated into the design curriculum.

'There is a relationship between the observed creative traits and product creativity': The students who talked to other students within the studio studio, who asked for opinions from the instructors but developed those ideas with outside information were found to come up with more creative products. Although the tables were not arranged in groups, the students were free to walk around and talk to others about their projects. In these conversations, ideas were developed and the creative process was furthered.

'There is a relationship between imagery and representation amounts and creativity': There was a relationship, however, it was the opposite of the previous study. This may be due to first year students' lack of experience regarding the transition from imagery to external representation. [$\chi 2=38.18$, $df=24$, $p<0.05$]. That is, the students who used more representation produced more creative products. For the question asking the amount of design the student has shaped in the mind, and the amount represented on a kind of medium, the students an equal number of students (28%) stated that they formed 30% in their mind, and 70% with sketches, models, and other externalization techniques. Among the students who completed projects that were found to be the most creative, 66.66% had stated that they used 70% representation and 30% imagery. The instructors agreed that the students who used more tools for externalization had more creative products. This is due to two factors. First, the student has the opportunity to see parts that are not working on a sketch or model, and secondly, s/he can better communicate the ideas to the instructors and friends so that feedback is more fruitful. 80% of the least uncreative projects were from students who stated that they did not like to draw or make models for externalization of their ideas. Thus, in terms of shaping and communicating ideas, 2D or 3D representations of projects are important. As is the previous study, imagery was mostly used in the 'readiness' stage, and representation in the 'revelation' and 'recreation' stage. However, the students who made more use of external representation could see their processes more clearly, be able to communicate more openly with their instructors, and incorporate divergent thoughts within the process.

'A deliberately applied user-identification stage may improve the quality of design products': The students were told to identify with the children who would be playing with the interactive toy especially after the first more divergent stages had passed and the students had begun narrowing down their options in order to find an appropriate solution to answer the creative problem. Students who had made use of this way of thinking, could be easily told apart as while they were explaining their projects, they would identify the age of the child, his or her abilities, and actually begin playing with

the toy themselves. Others were trying to solve the problem in the easiest and most convenient way using vertical thinking techniques. This took more time and resulted in less creative products.

80% of the students stated the importance of more time and less students in the studio for factors that would enable them to work more efficiently. 75% of them stated the same for factors that would enable more creativity. 3 of the students have mentioned the importance of the log-books in terms of helping them collect their ideas together. One student stated that it was his "inspiration book". The students have not been introduced to the "concept" yet as a theme to collect elements of their design together and enable a harmonious completeness, but 28% of the students stated that they found movies, magazines, books, music, the internet, nature, and the sea inspiring. Though some students have figured methods out on their own, the majority suffered some difficulty. Thus, there is a need for an introduction to concept definition and utilization in the first year. This might enable the students to have a more efficient "readiness" stage where they spend the most time but may not produce much. 44% of the students stated that they were the most creative in the initial stages, and the remaining 56% stated that the revelation and recreation stages they were the most creative as they had little time left to complete their work. According to the instructors, the students were more creative in the beginning stages and more efficient in the final ones. This could be observed from the processes of the students.

As in the previous study, the students believe that their hard work should be rewarded even if the product is not that appropriate. Although the creative process is very important, and taken into consideration by the instructors when evaluating the product, the purpose of the creative process is to reach a creative product that answers the requirements of the project or the needs of the users/ clients in other contexts. Regarding the expected grade of the students, 90% of the students stated that they deserved a full grade because they tried their best. More intermediate stages in a project and provision of an awareness of expectancies may aid better communication in the studio. As in the previous study, the instructors' and students responses were significantly different [$t=16.01$, $df=24$, $p<0.00$].

In the first weeks, the students had difficulty in understanding the project requirements as well as the way of thinking within the creative design process involving a more divergent technique. This comes from a tradition of solving tests which involve only convergent thinking as there is one specific answer. Preparing for the university entrance examination in Turkey shapes the whole education system, and by the time the students reach university they have gotten so used to the convergent way of thinking that they have trouble dealing with ambiguous design problems. That is why during the creative process, the students frequently asked for approval. It has been observed that during the course of the semester, the students got used to the uncertainty of a creative design problem.

In the following weeks, not only did they learn design terminology which enabled them to effectively communicate their ideas, they developed a certain foundation on which they could elaborate. Knowledge of the domain that was previously mentioned is clear at this point, where a creative result that is also appropriate is not possible without any prior knowledge of the field. Further implications for these studies would be to investigate the specific instances at which vertical and lateral techniques are utilized within the 5R stages, in order to be able to make use of it in the design studio. Further implications for these studies will be to do follow-up studies with the same IEU sample group in order to see variations in the approaches of students in different departments. This understanding can be carried on to the analysis of creative processes in other contexts.

CONCLUSION

It is crucial to understand creative decision-making process for the purpose of improving products both in education and practice. These studies aim to understand the process of creative decision-making to enhance the design studio process. Focusing on imagery and difference enhances the potential for reaching ideal creative solutions (Eisentraut, 1999). In order to create that difference and to free oneself of the constraints of traditional solutions, one must consider alternatives and practice bracketing of safe and obvious solutions. While relevance in vertical thinking refers to parts of the pattern from within itself, allowing irrelevant influence from outside of the creative problem solving process in lateral

thinking shakes the established grounds of patterns and gives way to creative solutions. It enhances our ability to see things differently, and to challenge paradigms, assumptions, prejudices, and worldviews. Although this sort of approach may seem to reach creativity at the expense of security in society, this is not the case, as an autonomous goal is trying to be achieved within certain partly controlled contexts. However, visionary people, processes, or products do not come along under totally safe and secure circumstances.

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SERVICE-SCAPE AND WHITE SPACE: WHITE SPACE AS A STRUCTURING PRINCIPLE IN SERVICE DESIGN

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Abstract

In design a lot of attention is given the material design object. In the traditional rhetoric of design where function meets form, it is often instrumental functionality and the form of the material/content that is referred to.

In some design fields, such as graphic design, the material design object incorporates the white space, the space between the content. For graphics design white space has been appropriated as an important part of the design process, and can be used to as one factor to distinguish between genres of, e.g., newspapers. Implicitly graphic designers use white space to create readability, structure, as well as aesthetics to their designs.

In service design, a concept similar to white space have not been acknowledged and used as an aspect of design. Service design comprises a set of methods supporting the modelling of service experiences, such as service-scape, service portraits, service interface, etc. These focus on the content of the service experience, without especially highlighting the importance of white space for designers.

In this paper we suggest that white space can be used as a structuring principle in service design. We exemplify the concept and how white space is conveyed with service design modelling techniques.

The case, a package delivery service, has undergone a change process where some parts of the delivery chain have been pushed towards self service, and simultaneously transformed into a more mass-customized genre of service. Moreover, the contact with delivery personnel has been even more limited than it is today. The new package delivery service thus restructures white space of the service, and highlights design aspects of the service.

We conclude that white space can be used as a concept for service designers to use as a structuring principle in designing service experiences, and that the challenges for future research lie in finding relevant modelling and analytic techniques for designers to enable them to actively work with white space in their designs.

Introduction

In design a lot of attention is given the material design object. In the traditional rhetoric of design where function meets form, it is often instrumental functionality and the form of the material/content that is referred to. Attention is forced away from the intangible issues of non-use or the form of non-content.

In some design fields, such as graphic design, the material design object incorporates the white space, the space between the content. For graphics design white space has been appropriated as an important part of the design process, and can be used to



as one factor to distinguish between genres of, e.g., newspapers. Implicitly graphic designers use white space to create readability, structure, as well as aesthetics to their designs.

In other design disciplines, such as service design, a concept similar to white space have not been acknowledged and used as a conscious aspect of design. In these design disciplines the methods focus on the design content, without especially highlighting the importance of white space for designers.

In this paper we will present aspects of white space in service design through an example case that suggests that white space can be used as a structuring principle in service design.

Framework

A service most of the time is described as being intangible, heterogene, and perishable. Moreover, it is considered that there is inseparability between production and consumption when it comes to services. Edvardsson, Gustafsson & Roos (2005) argues that this is an outdated definition, and that services rather are characterized by performance, processes and deeds. Lovelock & Gummesson (2004), e.g., agree partly with this and argue that for a specific service in a specific context, individual characteristics are more important than others, but they should not be viewed as a compulsory whole. When talking about service organizations, the term product-service system, PSS, is often used, to point towards a systemic point of view (Edvardsson, Gustafsson, Johnson & Sandén 2000). With that perspective the term servuction is often used, to differentiate from production. Even though these definitions are criticisable there is a consensus that services are processes over time carried out in space by people with the help of technology and objects.

Buchanan (2001) defines four orders of design. They are distinguished by their design object. The design objects are signs, products, actions and thought. The corresponding design disciplines are graphic design, industrial design, interaction design, and environmental design. In classical Swedish design theory the classification finds support from Paulsson & Paulsson (1957), as well as Hård af Segerstad (1957). Service design primarily deals with actions, the service milieux and the mindset of people.

Service design is, in contrast to service development, described as a human-centered approach and an outside-in perspective (Mager, 2005: Holmlid & Evenson, 2006; Holmlid, 2005). It is concerned with systematically applying design methodology and principles to the design of services (Evenson, 2005; Holmlid & Evenson, 2006).

Service design integrates the possibilities and means to perform a service with such qualities, within the economy and strategic development of an organization. A service designer can "visualise, express and choreograph what other people can't see, envisage solutions that do not yet exist, observe and interpret needs and behaviours and transform them into possible service futures, and express and evaluate, in the language of experiences, the quality of design" (Service Design Network, 2005).

As a discipline, service design should not be viewed in isolation, but in the context of service development, management, operations and marketing (Edvardsson, Gustafsson & Roos, 2005; Mager, 2005; Edvardsson, Gustafsson, Johnson & Sandén, 2000). Together these form the provisions for good service performance. User orientation, contextualization and other service development challenges are at the heart of service design (Edvardsson, Gustafsson, Johnson & Sandén, 2000; Kristensson, Gustafsson & Archer, 2004; SVID, Bruce & Bessant, 2002).

Service design activities appear throughout a service development process (see e.g. (Holmlid & Evenson, 2007; Moritz, 2005; Evenson, 2005; Mager & Evenson, 2006; Grönroos, 1990; Scheuing & Johnson, 1989). In these processes service design contribute with a set of modelling techniques for service experiences. Among these modelling techniques can be mentioned service-scape, customer journeys, service interface, etc (Bitner, 1992; Evenson, 2005; Zeithaml, Parasuraman & Berry, 1990; Shostack, 1984; Moritz 2005; Mager, 2005; Holmlid & Evenson, 2005). These focus on the content of the service experience, without especially highlighting the importance of white space for designers. Tschumi (1990), in e.g. his Manhattan transcripts (Tschumi, 1994), highlights space, movement and event, in order to transcribe things not normally include in architectural representation in the 70's. In the Manhattan transcripts he directed a small set of

representations to present the complex relationship between space and its use. In representations of services similar conceptual representations can be made, given that services are usage of space over periods of time deliberately directed by actors with certain objectives.

Modeling and prototyping are central in service design as in many other design disciplines. These activities are closely related to service development activities, such as documenting the servicescape (Bitner, 1992), performing blueprinting (Shostack, 1984), and defining touchpoints (Zeithaml, Parasuraman & Berry, 1990). Modeling techniques from other design disciplines can be used, such as personaes, scenarios, enactments, etc.

Given the nature of services as being processes over time carried out in space, two tentative categories of white space would be physical white space and time white space. If we also consider that actions are carried out within these processes, we could anticipate that non-activity could be regarded as white space. In service design one important focus for design work is the service evidence and the service interface. For these we can anticipate that specific aspects of white space will be important. For example, for a form or a receipt the white space of graphical design is crucial.

Example case

The case takes as its starting point the delivery of postal packages to non-company clients. We used three modeling techniques, an action model, a physical model and an actor model, to understand the role of white space in the service performance. The modeling techniques were used for a traditional package delivery service and a delivery service with a higher degree of self-service.

Traditional package delivery service

There are several different ways that traditional postal package delivery services function. We will base our description of a typical process from Sweden.



Figure 1. Traditional package service delivery. Photo: Mats Ramkvist. Source posten.se

Action model

The action model, when taking into account only the steps in the procedure, indicates three white spaces (see figure 2). The grey areas are the action related white-spaces.

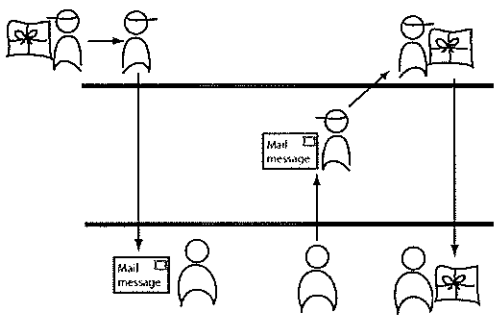


Figure 2. Traditional package delivery, action model

When introducing a time-aspect the white-spaces remain, but we are given a possibility to understand the amount of time of the white-spaces (see figure 3).

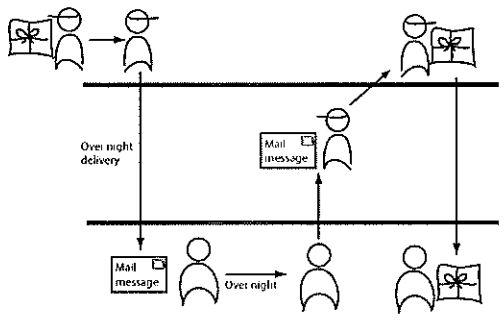


Figure 3. Traditional package delivery, action model with time-aspect

Physical model
In the physical model (see figure 4) the service points and white spaces are defined by the layout of the office space. In the figure the bright green area are the desks where a customer meets the service personnel and the green ellipsis around these areas are pre- and post-service areas. These areas are seldom occupied by waiting customers, and are thus regarded as white spaces. The marked red areas are white spaces due to the placement of doors. The green area overlapping the two red circles defines the space where the cueing ticket is picked up. This area is also regarded as a pre-service area, and as a white space; you are not standing there unless you are getting your cueing-ticket.

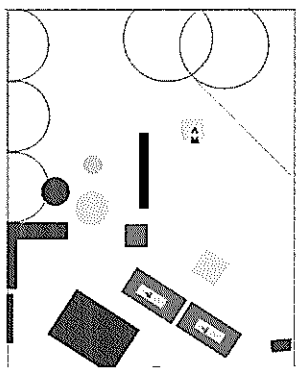


Figure 4. Traditional package delivery, physical model

Actor model
The actor model for a traditional package delivery service shows that there is both direct and mediated contact with employees of the delivery service (see figure 5). The mediated contact consists of a mail sent to the recipient. The form in this mail is used when picking up the package at the post office, as a token of identification.

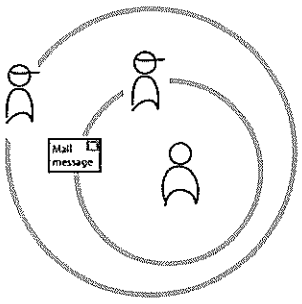


Figure 5. Traditional package delivery, actor model

Packstation package delivery service

In Germany an innovative delivery system recently was developed and implemented, with an increased degree of self-service. Instead of picking your package up at a post office, packages are delivered to a self-service station, a Packstation. The Packstations are available around the clock. When the package is delivered to the Packstation the customer receives an SMS/Email. With the registered chip-card the customer identifies herself and is allowed to retrieve her package from the Packstation.

If the particular Packstation the customer have registered for delivery is full, the postal service will decide a new delivery point for the package. This could be a Packstation nearby, or a post-office. The customer is informed about this change.

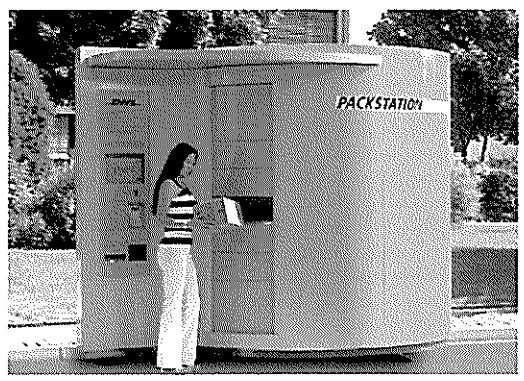


Figure 6. The packstation (source: Siemens press picture)

Action model
The action model for the Packstation shows some features of the service-process (see figure 7). The action and time-related white space is visible as grey areas in the model.

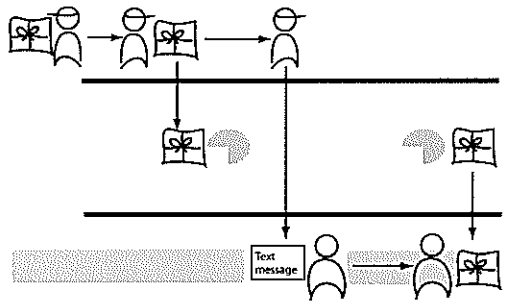


Figure 7. The action model for the Packstation delivery

The white space indicated consists of periods of waiting for the customer. The first period of waiting ends when the customer receives the text message (SMS or email). Until then the customer does not know all the steps of the logistics chain.

Physical model

The physical model for the Packstation shows some features of the service-scape (see figure 8). The dark green area indicates the customer-active area, where the chip-card is inserted, payment is made etc. The light green area on the Packstation indicates the pick-up area, which also can be viewed as the final step in the delivery process. The light green area on the ground is the area where a customer moves in and out of the self-service situation, this is a pre- and post-service area. The red area on the ground indicates a possible trail for a line of customers.

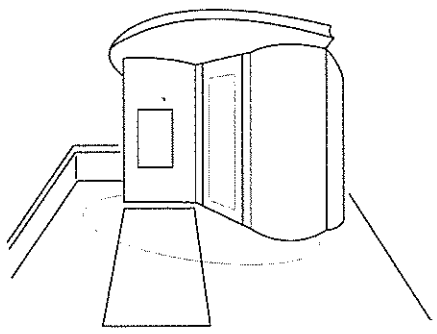


Figure 8. The physical model for the packstation. Dark green indicates an active service contact point, light green indicates a service area, and red indicates white space.

The main physical white spaces are the pre- and post-service area and the trail for a line of customers. In this example the open angle of the Packstation allows for both a line of customers and a restricted space of service action. The pre- and post-service area will be used only by the customer picking up a package.

Actor model

The actor model for the Packstation puts the customer at the centre (see figure 9). There is no direct contact between any individual of the postal service and the customer. All contact is mediated through technological means.

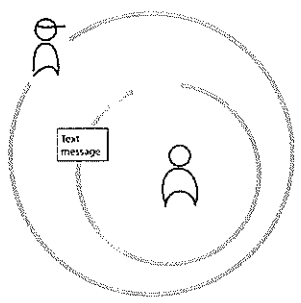


Figure 9. Actor model for the Packstation

Discussion

The tentative definition of white space for services comprising physical and time aspects, is not enough to capture important aspects of white space for service design. In comparison between the two examples there is a difference in social content of the service performance. The actor models capture these social aspects to a certain degree. That is, the increased degree of self-service introduces a social white space. As a consequence service designers need to rely more on the design of infrastructure and self-service terminals for service performance as well as brand value management. In the traditional delivery service, the brand values and the service performance was upheld, and adapted, by employees in direct contact with customers. As a consequence service designers here need to rely on personnel resources, such as service mindedness, situated adaptability of service performance, etc. In the transition between service systems, the decreased social contact with employees of the service organization will be experienced as a social white space. Similar development can be found in the banking sector, where bank offices have been totally restructured as a way of demanding more usage of self-service technologies as well as an effect of the increased self-service possibilities.

There can also be noted a qualitative difference between white spaces in the two examples. One distinguishing factor is who has control of the white space. In the action model this can be distinguished in the following manner (see Figure 10).

The model shows that the amount of customer control over white space is larger when using the Packstation delivery, than using a traditional delivery system. In the Packstation example,

at the precise moment the customer receives notice that the package have arrived through the text message, she is in control over the period of waiting before picking up the package.

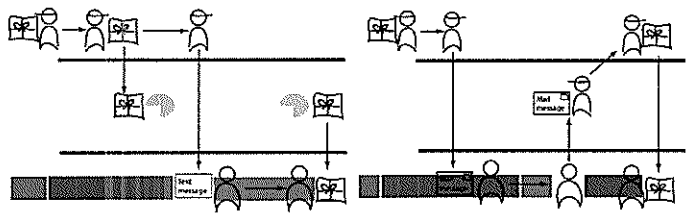


Figure 10. White-space and control. Packstation example to the left, traditional delivery to the right. Blue indicates that the customer has control, green that the customer have shared control, and red that the customer have no control.

In the traditional package service this is not the case. When the customer receives the notice, when picking up the mail at home after work, she might be required to wait over night before the post-office is open again. During this period of waiting she is in no control over the white space. Similarly, she is in no control of the waiting period due to locating the package at the post-office, which is performed by the service personnel.

Moreover, in the traditional package service delivery process the overall time span from arrival of the package to the post-office consists of delivering the mail message to the customer and the period of waiting between that and the opening hours of the post-offices. A conceptual comparison of the two different delivery methods shows that with the Packstation the customer can pick her package up before she would know that the package had arrived at the post-office in the traditional delivery process.

Working with the white space of the traditional package delivery system as a focus for design we suggest two possible ways. One could 1) focus on shortening the time before customers getting notice of the arrival of the package, through an SMS, or 2) finding ways to increase the opening hours for offices where packages could be picked up.

In the design field that deals with graphic as a design object the white space is a natural part of the design representations and expressions, which is not the case for service design. In service design representations, such as blueprints, the white space can sometimes be identified, but there is not necessarily any relationship between amount of represented white space and the white space in actual service performance. Some of the modeling techniques used above can be developed to integrate white space as part of the representation and design expressions.

Conclusion

Based on the white space concept presented and the case, white space should be considered as an integral part of the design object of services. Based on the discussion we conclude that deliberate design work with appropriate methods and tools treating white space as an integral part of the service design object, provide new means for finding structuring principles for specific design challenges.

The challenges for future research lie in finding relevant modelling and analytic techniques for designers to enable them to actively work with white space in their expressive design work.

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UNDERSTANDING THE ORDER IN DISORDER: ANALYSING PROFESSIONAL IDEOLOGY OF INDUSTRIAL DESIGN IN TURKEY THROUGH DISCOURSE

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Abstract

Industrial design, which is a fairly young and largely unknown profession in Turkey, is slowly establishing its identity and redefining its conditions of existence. During this "evolution" process, many contradictions surface resulting from the unique characteristics of Turkey.

One of the key elements that form the core of this newly found identity is professional ideology. In this paper, authors endeavour to lay down a conceptual framework for investigating the professional Ideology of Turkish Industrial Design, through a rigorous analysis of the discursive expressions of Turkish designers in the biggest communicative medium that is used by them: ETMK Platform E-mail Group.

Apart from economic and educational development, such a study will contribute greatly to our understanding of the concept of "Turkish Designer", not merely as a professional but also as a "social" entity within the complex network of socio-cognitive and discursive relations.

Keywords: industrial design in Turkey, professional ideology, discourse

The historical development of industrial design (ID) in Turkey and the socio-economic factors that affect this process have been investigated by various scholars (Asatekin, 1979; Er, 1993; Er, 1998; Er and Bayazıt, 1999; Er and et al., 2003). Using these valuable works as anchor points, the professional development process that ID undergoes in Turkish context can be sketched to some extent. However, it must be admitted that there are many gaps in this picture which must be filled.

Most of the above mentioned investigations evaluate ID in its economic and/or educational context. However, one of the most significant missing pieces in this story of professional development is an analysis of industrial design and designers as social entities.

According to Abbott (1988), the history of professions is the history of the "jurisdictional disputes", that is, different professions literally "fight" for gaining control of specific domains of knowledge. During these processes, nearly every profession –as a social creature- forms a core system of values and beliefs upon which they can build their sovereignty and social identity. Naturally, such a system can only be established by the conscious and unconscious collective acts of the individuals engaged in a certain profession, namely professionals, who -by definition- form a social group.

This core system of values forms the "basis of social representations that are shared by the members of this social group" (Dijk, 1998:8). That is, such a system tells those individuals who they are, what their shared values are, what their relations with other social groups are...etc, illuminating

the basic economic, social and cultural interests and beliefs of a particular social group.

In this sense, such social representations can be defined as "ideologies". More specifically, when we are investigating the ideology of a certain professional group[1], this particular ideology can be defined as a "professional ideology". Therefore, understanding the ideology of a profession is crucial in understanding the professional development.

As ideologies are social entities that are constantly evolving and changing in time, it is meaningless to mention about a static and given concept of professional ideology. Professional ideologies are produced, defined and reproduced in time, within different social settings. Looking through this perspective, one of the most prominent elements that has role in these definition, articulation and reproduction processes is the professional discourse. That is, individuals acquire, produce, reproduce, express and exchange ideological patterns by and within discourse. Needless to say, it is crucial to analyze discursive manifestations of a professional group in order to understand their professional ideology. However, it must be noted that ideologies cannot only be limited to discursive manifestations.

Within this context, the aim of this introductory paper is to lay down a conceptual framework for such an analysis of the professional ideology of Turkish Designers through an investigation of their discursive manifestations in ETMK Platform E-Mailing List, which is the biggest communication platform, that has been used by Turkish Industrial Designers since 1999. The reasons for choosing such a medium will be clarified in the following sections, yet it must be taken into consideration that this e-mail group is one of the few mediums in Turkish Context that such a large number of industrial designers can meet, communicate and exchange ideas.

[1] Members of a certain profession form a solid social group as they obviously have similar activities, goals and interests and with which many or most members may identify. Given the conflicting nature of interests between different professional groups, the domain of professions is a suitable candidate for the formation of ideologies or more explicitly "professional ideologies".

While establishing such a conceptual framework, firstly the controversial concept of "ideology" will be discussed. Such a discussion is necessary as there are volumes of work and definitions for this theoretical instrument, most of which are not complimentary but rather contradictory. Thus, it is crucial to clarify that why the authors have chosen a certain definition among this ocean of different approaches and theorizations. After establishing this conceptual foundation; authors will express their method of analysis and will introduce the medium[2] over which they conduct their study concerning the discursive analysis of the professional ideology of Turkish Industrial Designers. A brief discussion will follow the presentation of the findings of the research.

Ideology: A Conceptual Framework

"Nobody has yet come up with a single adequate definition of ideology, and this book will be no exception" (Eagleton, 1996:1). In parallel with the starting words of Terry Eagleton's seminal book, "Ideology: An Introduction", this limited introduction will be no exception either. Again, as Eagleton states, the term "ideology" is not merely a word, rather it is a text, "... woven of a whole tissue of different conceptual strands; it is traced through by divergent histories..." (1996:1). In this introductory study, it is impossible (and needless) to trace the whole historical development of the term "ideology" , since Destutt de Tracy's "invention" of this concept in 18th century. However, it can be useful to provide a very short explanation of the authors' perspective, through which they interpret this relatively vague term.

Although there are many different theories regarding this controversial concept, historically, two main streams of thought can be identified. The classical notion of ideology can be traced back to Hegel. This oldest school of ideology continues with thinkers such as Marx, Engels, Lukács, Gramsci, Althusser and some later Marxist thinkers. The classical notion is basically based upon the concept of "false belief" that conceals the real social relations. Furthermore, this lineage of thought theorizes ideology around concepts such as illusion, mystification, distortion, true and false cognition which are generally

[1] ETMK Platform E-mail List

associated with different ideas of power and dominance (Eagleton, 1996:3). According to Dijk (1998), there are –roughly- four main characteristics of this classical tradition:

> **1)** Ideologies are false beliefs
> **2)** Ideologies conceal real social situations and serve to deceive others
> **3)** Ideologies are beliefs that others have
> **4)** Ideologies presuppose the socially or politically self-serving nature of the definition of truth and falsity (Dijk, 1998:2)

The other strand, which is less pejorative, deals with the role of ideology within social life and can be classified as being sociological rather than being epistemological (Eagleton, 1996; Dijk, 1998). This approach was developed mainly in the second half of the 20th century and has a "positive" content, that is, this group of theories is not occupied with demystifying the hidden networks of repression and power mechanisms. Quite the contrary, they seek to "understand" the place of ideas in their "social" context as they are. Here, Hall's definition (1996) can help us to understand the main points of this second approach:

> By ideology I mean the mental frameworks –the languages, the concepts, categories, imagery of thought, and the systems of representation – which different classes and social groups deploy in order to make sense of, figure out and render intelligible the way society works (Hall, 1996:26).

The definition of ideology upon which authors will build their arguments –which is ra version of Hall's definition – depends on a long term multidisciplinary research project that has been started by Teun Van Dijk and his colleagues in University of Amsterdam in 1993. This versatile approach can be adapted to different contexts easily. Moreover, it successfully creates a theoretical apparatus that can be used both in social and cognitive levels, that is, this conceptual tool can not only be used for explaining macro level structures but also ties these macro level structures to the very lives and social actions of the individuals. Furthermore, Van Dijk's model possesses a theoretical explicitness which many other approaches lack, where they only "remain at a level of abstraction" (Van Dijk, 1998:8).

Van Dijk (1995) makes a definition of ideology that has significant similarities with Hall's (1996) definition:

> Ideologies are basic frameworks of social cognition, shared by members of social groups, constituted by relevant selections of sociocultural values, and organized by an ideological schema that represents the self-definition of a group. Besides their social function of sustaining the interests of groups, ideologies have the cognitive function of organizing the social representations (altitudes, knowledge) of the group, and thus indirectly monitor the group-related social practices, and hence also the text and talk of members (Van Dijk, 1995:248).

Following this definition, the main points of Van Dijk's socio-cognitive theorization of ideology can be summarized as follows (Van Dijk, 1995; Van Dijk, 1998; Van Dijk, 2001):

1) "Ideologies are cognitive": It must not be forgotten that although ideologies are social and/or political entities, they have a profound cognitive element. Ideologies are shared social representations of group members, yet each member or actor uses and applies ideologies in specific, personal occasions. They are "belief systems", that is, they involve mental entities such as ideas, values, thoughts, judgments yet at the same time they serve to regulate those elements in a social level.

2) "Ideologies are social": Every single group – both dominant and dominated- has ideologies that they identify with. Those ideologies regulate goals and actions of a certain group in social arena. Apart from dominant and dominated ones, other social groups such as professionals, action-groups (environmentalists, anti-globalists...etc), organizations and intuitions (the military, bureaucratically bodies...etc) also have ideologies.

3) "Ideologies are socio-cognitive": Ideologies act as "interfaces between the social and the cognitive" (Van Dijk, 1995: 245). Similar to the usage of language, although there is a meta system or grammar (ideology) that sets rules on the usage of language, each individual uses the language differently in a personal level. While ideologies act as a schema that help

group members to make sense of social reality ,to regulate their relations with other groups and their daily acts in social situations (Button, 1991); they also operate in a cognitive level involving beliefs, values, attitudes and opinions. At social level, ideologies help groups to establish frameworks regarding their social, political and economic benefits. On the other hand, they provide each group member a "set of instructions of action" which they can re-interpret in every social occasion, such as deciding or not deciding to participate in a demonstration against globalism as in the case of an environmentalist.

4) "Ideologies are not true or false": Van Dijk does not evaluate ideologies on the basis of truth or falsity as opposed to classical approaches. Rather, he seeks to understand ideologies to analyze their functions in serving a certain group's interests.

5) "Ideologies may have various degrees of complexity": Ideologies do not always come in the form of a well established, total system that governs the social acts of individuals. Quite the contrary, they may be inconsistent pieces of a bigger "-ism" such as communism or leftism. As long as they serve as an interface for controlling social action, they can be mixed, vague, inconsistent and not well defined. Furthermore, different members of a certain group may have different views of the same ideology. For example -depending on the social role of an individual- ideologues and leaders in a certain group may have a more complex understanding and articulation of that specific group's ideology.

6) "Ideologies have contextually different manifestations": Personal ideological manifestations of group members can be quite varied and sometimes be very contradictory. However, this does not mean that ideologies themselves are inconsistent. Depending on various factors, people may have different expressions of the same ideology under different circumstances. Moreover, ideologies are not deterministic: "They may influence or monitor social discourse and action, but they do not 'cause' or 'determine' these, nor are they the only mental systems controlling discourse production and comprehension" (Van Dijk, 1995:247).

7) "Ideologies are general and abstract": Van Dijk's theory states that ideologies are context free abstract systems. Only, their expressions in different situations and context may vary. This notion helps us to understand why group members –more or less- have consistent discourse in a variety of social situations.

The Ideological Discourse Analysis: Categories, Definitions and Descriptions

The theoretical framework, that has been summarized in the previous sections, was used to illustrate the ideological landscape of ETMK Platform E-mail List, which is the biggest communication medium used by "Turkish" Industrial Designers. However, it must be noted that this limited study is only a starting point in an ongoing investigation that will pave the road to a more explicit and detailed mapping of the professional ideology of industrial designers in Turkish context. The reasons for choosing ETMK Platform as the target of such an ideological discourse analysis can be summarized in 5 points:

1) ETMK platform has been the largest communicative medium that is used by Turkish industrial designers with its 1080 members, since 1999.

2) The list encompasses not only Turkish industrial design professionals but also industrial design students, academicians and some other professionals-albeit only a minority- who are coming from different backgrounds such as graphical design, interior architecture, architecture... etc and who are involved with industrial design in different contexts. Therefore, ETMK Platform inherits the variety which is crucial for such an ideological analysis.[3]

3) Ideology is basically a shared group belief that is the source of this specific group's social representations as mentioned in the previous sections of this text. Although elites, ideologues or leaders of a certain group may affect a group's ideology more profoundly than other members; the group ideology is not limited to their ideas. On the contrary, production and evolution of a professional ideology is a collective act

[3] It must be taken into consideration that it is not possible to correctly identify the background of every member of ETMK platform. This is due to the fact that people may use different personas in virtual communication. However, the majority of members can be verified to be coming from industrial design background.

that continues simultaneously in many different layers of a group. Unlike other discursive sources such as architecture and design magazines or interviews of Turkish designers in daily newspapers which only contains the ideas of an "elite minority" of Turkish Industrial Designers or academicians; e-mail groups are open to every member of Turkish Industrial Design community.

4) Although there are other e-mail groups that involve a large body of industrial designers such as Dexigner and Ideology, ETMK is the oldest one. Therefore, it is easier to track the evolution –if there is any- of the professional ideology.

5) One of the key elements of a successful ideological analysis is uncovering hidden expressions behind the discursive manifestations. Such a masking generally results from contextual constraints. For example, as racism is a universally detested phenomenon, racist people generally obscure their true emotions about minorities in public discussion. Since, ETMK Platform is a closed group[4] that excludes employers, academicians and professionals from other disciplines such as engineering; members of this list can openly discuss and share their beliefs and opinions regarding their profession without such contextual constraints. For instance, an industrial designer may not want to express his/her true opinions about engineers or his/her employers in a magazine interview which is open to a larger and more diverse public.

As mentioned previously, this analysis is only a small part of an ongoing study on the professional ideology of industrial designer's in Turkish context. To this end, writers rigorously read and analyzed 4051 e-mails which have been sent to the list in 2004, 2005 and 2006[5]. From its establishment in 1999 to the beginning of 2007, a total of 7736 e-mails have been sent to the list. Thus, authors' analysis covers 52.37% of all mails which is slightly more than the half.

[4] It must be noted that ETMK Platform is not a totally closed group. Although mainly formed by industrial designers there are some engineers, architects, employers ... etc in this mail group. However their presence is negligible as a contextual constraint as they are only a minority.

[5] 1538 e-mails in 2006, 1312 e-mails in 2005, 1201 e-mails 2004.

The content of the 4051 e-mails, which are evaluated for the analysis, greatly varies. Apart from discussions over professional matters, there are also various other topics sent to the list such as job-ads, event, meeting and exhibition announcements, obituaries, inquiries over professional/technical problems or any other popular topics including the current social and economic problems of Turkey. This variation was expected, regarding the nature of e-mail groups. Thus, writers screened some 4051 mails and eliminated the ones that have non-ideological content relying on Van Dijk's (1998) and Ruth Wodak's (2002) conceptual categories for ideologies:

1) *Ideological discourse defines who and what we are:* The self-identity descriptions of an ideology are generally positive. Also such discourse defines "the others", the ones we exclude from our group. Generally, a negative description of the others is one of the most crucial factors of our self-identity. Also, such discursive manifestations clarify the admission procedures of a group: What is required to become a part of Turkish Industrial Design Community? As Dijk states (1998); these kinds of self-identity expressions generally occur in groups who feel that their very existence is threatened by some other groups or factors.

2) *Ideological discourse defines our relations with other groups and our relative social position:* As mentioned in the previous category, a positive self representation is generally constructed over a negative other presentation. This negative presentation of other groups also defines "our" group's place in social landscape.

3) *Ideological discourse defines what we do:* This kind of activity description is common for professional groups since a "profession" is generally defined as "formally rational abstract utilarian knowledge" (Murphy, 1988:245). That is, a profession is a way to do something or accomplish a task. This kind of discourse also includes the expected social roles of a specific professional group. These activity descriptions are generally followed by positive definitions of social goals, which make those activities meaningful and respectful in front of the public.

4) *Ideological discourse defines our norms and values:* Typically, professional ideological discourse focuses on what is right or wrong for a certain profession including professional ethics. For example, as originality and innovation are in the locus of

industrial design profession; there are various topics in ETMK platform involving debates over idea-theft and intellectual property rights.

5) *Ideological discourse generally involves resource description.* As social resources such as knowledge, expertise, jobs, reputation, status, income... etc are as scarce as economical resources, conflict between different groups over the acquisition of such resources is inevitable. For example, industrial designers and graphic designers were fighting over the ownership of certain areas of expertise such as the design of interactive displays and information systems for years, whereas a totally new professional group, interaction designers, emerged to claim their rights over the same domain of expertise at the end of 80's.

In the light of these hypothetical categories, the writers have determined the e-mails which had ideological content. According to these criteria 183 e-mails in 2006, 287 e-mails in 2005 and 176 e-mails in 2004 were found out to be ideological in content, making a sum of 646; which was 15.95% of all mails in these three years. Furthermore, these 646 e-mails have been sent under 21 topics in 2006, 21 topics in 2005 and 19 topics in 2004, making a total of 61.

The Analysis: A Summary of Results

As stated in the previous section, every ideology needs "negative others" upon which it can postulate a positive self-identity. The professional ideology of Turkish Industrial Designers is no exception. It can be argued that, there are 4 main "big" negative others of Turkish industrial design: Turkish industry and/or employers, foreign designers, other professional groups, especially architects and mechanical engineers and finally the consumers (or the public).

One of the key elements of a discursive analysis is repetition. As ideology is -roughly- a shared belief system, it is crucial to identify the key themes that are shared and expressed by the majority of the group members. Among 61 topics that were analyzed; there are 11 topics posted concerning negative reactions about job-ads which thereby had the greatest frequency.

Since one of the most important characteristics of a professional ideology is the definition of activities of a professional group; this situation is not surprising. In ETMK Platform, most of the mails regarding job-ads are negative reactions against the employers who are perceived to be oblivious about industrial design profession's activity areas. That is, according to the most of the members who posted e-mails within these topics, majority of the Turkish enterprises are unaware of the "superb" professional qualities, talents and various services that industrial designers can offer (Gunes, 2006; Bıcı, 2006; Gencoğlu, 2006; Yalım, 2005; Oral, 2005; Gencol, 2004).

Furthermore, many list members also think that most of the Turkish companies "do not respect"(Yildiz, 2006) the "merits" of industrial designers , and do see industrial designers as CAD technicians whose value is evaluated according to their specific knowledge on using certain software packages such as AutoCAD and 3d Studio Max (İçgüdel,2006; Karakaş,2006; Gunes, 2006; Kuday, 2006; Örsel, 2005; Topcu, 2005). These "disrespectful" companies who do not appreciate the importance of designers are also oblivious to the fact that ID is one of the most "difficult" professions (Borand, 2004; Gunes, 2004; Neci, 2005). In parallel with this topic, most of the industrial designers who post mails to the list have complaints about their positions in the organizational structures, their working conditions, job descriptions and salaries (Kuday, 2006;Gürkaya, 2006; Helvacıoğlu, 2006 ; Gencoğlu, 2006; Yeşil, 2006).

The second most frequent topic is the arguments and criticisms about design competitions. It would not be wrong to connect this debate to the general image of Turkish companies who are mostly perceived to be exploiting designers and their talents.

Naturally, not all the competitions are accused of transgressing designers' rights. However, the statements of the writers of ETMK Platform regarding the companies that arrange the accused competitions seem to be nourished from the "negative other-representation" of Turkish enterprises. For instance, in a topic about a design competition organized by Starbucks, writers harshly criticize the company for not granting proper prizes for the winners (Bağlı, 2004; Asatekin, 2004). In another topic, Durmuş (2005) accuses Starbucks being "malicious" as he declares "A so-called giant world-wide company is again organizing a makeshift competition to exploit the designers and for paying them 'nothing' for their designs". On the other hand, some list members think that

some companies organize these kind of competitions just to have as many design alternatives as possible for the price of a few. Also, they see designers as "fatheads" and "goofs" (Erkan, 2004; Durmuş, 2005; Tunçer, 2005).

Apart from these negative other-representations; list members do have another great nemesis that shapes their socio-cognitive landscape: foreign designers. The large Turkish corporations –who do have in-house design teams and who are thought to be having a better idea about defining what a designer is- are thought to "admire" and respect foreign designers –especially Italians- as the true bearers of aesthetic taste and judgment (Gürsu 2005; Örsel, 2005; Tartan, 2005). Although debated in various mails under different topics; the locus of the argument crystallizes in a topic titled "O Sole Mio Bellona". Among 61 topics that were investigated, this is the longest one considering number of mails and participants. Shortly, the topic begins with the depiction of a TV advertisement of a Turkish furniture company, Bellona; showing superbly talented Italian designers creating "miraculous" sofas. As the argument develops, list members claim that large, famous Turkish enterprises are aware neither of the potentials nor professional talents of Turkish industrial designers. Furthermore, it is believed that they have no trust in Turkish designers at all (Oral, 2005; Usakligil, 2005; Yağız, 2005; Asatekin 2005). Even one list member characterize this TV-ad as an "ignorant attack made on Turkish design and the proud of Turkish people" (Yağız, 2005). Moreover, Aksu (2005) finds "especially Turkish SMEs" worthless and identifies this "worthlessness" as the key factor of the underestimation of Turkish design by those companies. Even, Turkish industry is illustrated as an "imitator of foreign firms and products" which is incapable of creating novel products (Helvacioglu, 2005). These notions also appear in the debates regarding job-ads over and over again.

Interestingly, most of the list members that post e-mails under this topic see this situation as the reflection of a xenophilia[6], which they see as one of the inherent qualities of Turkish culture, and which has "infected" Turkish modernism for years (Kuday, 2005; Yeşil, 2005; Uşaklıgil, 2005; Yağız, 2005; Akman, 2005; Güneş 2005). Despite some counter arguments; most of the participating arguers reach an agreement as the focus shifts from unconscious companies to the unconscious Turkish public and their unawareness of design profession. According to some industrial designers (Yagiz, 2005; Gürşimsek, 2005; Kuday, 2005; Ürgen, 2005; Gürsu, 2005) this "unconscious" policy to employ foreign designers is a reflection of the marketing strategy that targets an oblivious public who lacks the proper understanding of design culture. Therefore one of the key responsibilities of industrial designers is not only "educating" the industry but also "injecting" design culture to the public.

Naturally, "Turkish design" and an emphasis on a conscious reinterpretation of Turkish cultural values emerge as the dialectical twin before the foreign designers. According to Oral, Uşaklıgil and many other ETMK Platform members (2005) "Turkish Design" must be promoted for creating a global brand such as "Italian", "German" or "Finnish" design.

The three ideological negative "big others" of Turkish Industrial Design seem to form a vicious cycle in the mental realm of Turkish Industrial Designers. It can be argued that, this vicious cycle with its elements continuously referring to one another –thus obscuring the real referents- leads to a specific state of alienation from the public and the industry, which deeply affects the "self-identity" of Turkish Industrial Designers. A feeling of insecurity makes them to feel obliged to "unite against industry and others" (Trupia, 2006) for defending their rights. However, at this point, the reactions seem to be impulsive rather than rational.

Another common notion that maps the shared beliefs of Turkish industrial designers is a common mistrust directed against Turkish Design Education and Educators (Aydin, 2005; Baltaci, 2005; Topçu, 2005; Tartan, 2005). The arguments about design education are very detailed. While some of points in these arguments deserve a more detailed analysis, they are mostly well beyond the limits of an ideological inquiry, especially within the categorical limits that has been set. Nonetheless, the attitudes of the list members against design education is rather paradoxical as they constantly mention about the superior "qualities" and "talents" of Turkish Designers specifically during discussions about the "malicious foreign danger".

[6] Admiration of foreigners

Last but not the least, the final ideological enemy of Turkish Industrial design is other professionals that intrude on the expertise and professional domain of "educated" industrial designers. Not surprisingly, most of the professionals that fit into this category are either mechanical engineers or individuals coming from other design disciplines such as architecture, interior design and graphics design. However, as there is no legal regulation that grants a license or superiority to the educated industrial designers; Turkish industrial designers seem to have difficulties about defending their professional positions, at least in front of law. These notions melt into larger and multi faceted arguments regarding the boundaries of the very nature of industrial design profession. Thus, without loosing the current flow of our discussion, it will be sufficient to say that those "other" professions establish a crucial part of the "positive" self identity of industrial designers.

Conclusion

The initial findings of this limited study support Er's (2007) claims about the nature of the development process of industrial design in Turkey. According to Er (2007), Turkish Industrial Design faces a "profound crisis" upon its encounter with Turkish industry –mainly formed by SMEs[7]- which are undergoing their own "authentic" economical modernization processes. The main reason of this "shock" is the deep dissonance between the Turkish Industry and the Turkish Industrial Designers who are educated and conditioned to "operate" under the well defined conditions and processes of western-like modern economy. Furthermore, endowed with a cultural mission to educate both the public and the industry about the merits of "good design", the Turkish Industrial Designer fails to recognize the real core of the problem (Er, 2007).

Within this perspective, it is interesting to observe the harmony and consistency between Er's socio-economic analysis and the cognitive "mapping" of the collective mind of the Turkish Industrial Designer. Industry and public are still continuing to be the "big others" or negative representations around which industrial designers form the social projection of their professional group identity, namely their professional ideology.

However, it must be noted that this study is only a limited introduction for beginning such a complicated analysis. On the other hand, social theoretical categories such as ideologies –because of their ever evolving nature- are impossible to analyze as a "whole" like every other social phenomena. Ideologies are multi layered web-like structures, that is, to isolate an ideology from its neighbour ideologies is nearly impossible. For instance, a complete investigation of the professional ideology of Turkish industrial design can only be finalized by establishing some links with systems such as capitalist ideology and Turkish modernization. It is clear that such a task is too complex to undertake. Thus, we can only have a rough illustration which may pragmatically enable us to have a slightly better understanding of a professional group within the boundaries of this study.

Finally, it must be taken into consideration that (sometimes) trying to find a correspondence to all of the hypothetical ideological categories which authors used as a foundation for their analysis can turn out to be impossible (or meaningless). For example, a complete mapping of the activities of industrial designers was not provided as professional groups are greatly defined by what they do and definition of some of those tasks (like creating innovative products which is the core of the profession) is needless to be repeated. Thus, every such analysis must be evaluated within their specific context and criteria.

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[6] According to the data provided by Small and Medium Industry Development Organization of Turkey, small and middle sized enterprises form 98.2% of Turkish companies.

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AESTHETIC OF DISORDER: NEW CONCEPTIONS IN ARCHITECTURE AFTER THE 1990s

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Abstract

The concept of order takes central role in the definitions of architectural design. On the one hand the creation of order is the ultimate aim of design, on the other hand the concepts such as; purpose, reason, predictability, systematization, formality etc. related with order effective on design process in the creation of order. This is valid for each period of history of architecture. To reach ideal order of their own period, designers have struggled to create methods, rules, models for the determination of design process. They have created types, norms, models, and systems. In this way, a variety of diverse orders such as natural order, human body's order, mechanical order, scientific order etc. have received as models by architects. But especially after 1990s, opposite concepts such as arbitrariness, randomness, informality, formlessness etc. replaced the mentioned concepts which are related with order in contemporary architectural theory and practice. Architects and groups including Zaha Hadid, Sanford Kwinter, FOA, Nox, Cecil Balmond, Greg Lynn, Daniel Libeskind have argued a new architectural order. For the legitimization of their own discourses, they used these concepts which are related to disorder with some contemporary scientific and technological developments. What is commonly believed that the scientific revolution is to have had a source for architecture of new era. It is common to refer to chaos theory, complexity theory, fractal geometry, and the recent developments in biology.

Thus, this paper intends to explore how the concepts related with disorder, of which origin is in science, have been used to create a new architectural order and to investigate these struggle signs of the changes in the understanding of traditional order in architecture by the analyses of architects' writings and oral explanations.

Keywords: order, disorder, science, architecture

The concept of order takes central role in the determinations of architectural design since antiquity. Vitruvius defines the fundamental principles of architecture in the second chapter of Book I of The Ten Books of Architecture; "1. Architecture depends on Order, Arrangement, Eurhythmy, Symmetry, Propriety and Economy. 2. Order gives due measure to the members of a work considered separately, and symmetrical agreement to the proportions of the whole."[1] He determines the concepts related to order as main instruments in the creative process of end-products and explains the rules of order. Vitruvius was obsessed with the perfection of human proportions as a model for architecture in the determination of these concepts and rules. Vitruvian stylistic thinking became a guide for the creative process until the end of nineteenth century. A variety of diverse orders such as natural order, human body's order, mechanical order, scientific order etc. have been received as models by architects like in Vitruvian myth. Also, Alberti's the concept of *concinnitas* in his De re *aedificatoria* of 1452, which was the first Renaissance treatise, exemplifies the relation between living nature's order and architectural design. He writes in Book VII, Chapter V that;

> "...as in an Animal, the Head, the Feet, and every particular Member, should be exactly proportioned to all the other Members, and to all the rest of the body; so in a Building, and especially in a Temple, all the Parts should be made to correspond to exactly, that let us consider which of them we please, it may bear its just Proportion to all the Rest."[2]

In the seventeenth century, geometry and mathematics became normative in architectural design by the effective of Galileo's scientific discoveries. Architects like Claude Perrault accepted that the order of nature could be understood by mathematics

and geometry. They believed the elements of mathematical sciences provide the most perfect imitation of natural order.[3] In the eighteenth century, inspired by Newton's empirical science, architects regarded the simplicity and mathematical rationality of nature as a guide for architecture. Simple and well-defined geometries became only a practical tool for the reduction of building process into a technological process.

In the nineteenth century which is the period that many new theories were produced to reconstruct a new architecture, metaphorical relations to natural order became main instruments in the creation of architectural order under the guide of stylistic design thinking. With Gottfried Semper, this interest on natural order, by gaining a scientific character, transformed into a tendency towards the laws and rules explaining this order; "The art of building creates original forms, which are not determined by models in nature. It creates them in accordance with the same laws which nature follows and which are founded on purposiveness."[4] Like Semper, Viollet-le-Duc asserts that architects are forced to go forward just as nature does, by using same laws and same main logic of its order. For Viollet-le-Duc purposiveness and functionality are basic concepts for understanding the logical order of nature.[5]

At the turn of the century, architects believed that modern architecture could not be constituted by Vitruvian thinking of order. They were in struggle for finding new sources to create a new architectural order and presented different theoretical projects under the names of Jugendstil, Moderne and Art Nouveau. They had a tendency towards natural order and contemporary technologies. With Adolf Loos, architecture completely went away from stylistic thinking. Purposiveness, functionality, exactness, rationality, utility, homogeneity became basic concepts in the creation of architectural order. In the hegemony of modernism, they were accepted as main guiding concepts to demolish the old order and their dominant roles keep up to today.

After 1990's, opposite concepts such as informality, formlessness, complexity, heterogeneity, arbitrariness, randomness, uncertainty etc. replaced the mentioned concepts which are related with order in contemporary architectural theory and practice. Today, this change, beginning with Robert Venturi's *Complexity and Contradiction in Architecture* and Colin Rowe and Fred Koetter's *Collage City* and continuing with Mark Wigley and Philip Johnson's *Deconstructivist Architecture*, has reached a state that these concepts are the main elements of the language of a new architecture. Such that; while in 1966 Venturi says;

> "I welcome the problems and exploit the uncertainties. By embracing contradiction as well as complexity, I aim for vitality as well as validity. Architects can no longer afford to be intimidated by the puritanically moral language of orthodox Modern architecture. I like elements which are hybrid rather than 'pure', comprising rather than 'clean', distorted rather than 'straight-forward'..."[6]

Since the 1990s, these concepts have been normally used in the presentations of projects of architects and groups and in writings of architectural theorists including Zaha Hadid, Sanford Kwinter, FOA, Nox, Cecil Balmond, Greg Lynn, Daniel Libeskind, Jeffrey Kipnis, Charles Jencks.

Although their architectural discourse seems to be constructed on a general critics of Modernism, it can mostly be said that these struggles are based on architectural form and oriented towards to construct a new aesthetic expression. Architectural theorist Jeffrey Kipnis writes in the article titled *Towards a New Architecture: Folding* that;

> "If it (new architecture) is not to repeat the mistakes of Modernism, it must continue to avoid the logic of erasure and replacement by participating in recombinations. As far as possible, it must seek to engender a heterogeneity that resists settling into fixed hierarchies. Furthermore, it must be an architecture, ie. A proposal of principles ... for design. Finally, it must experiment with and project new forms..."[7]

Designers also legitimize their orientation to mentioned concepts by ordering the relationship between them and some contemporary scientific and technological developments.

What is commonly believed that the concepts and theories of contemporary science and technology is to have had a source for architecture of new era. Architects have emphasized the

new characteristics of today's world and asserted that a new architectural aesthetic language appropriate for the new world should be created. Most referred concepts are dynamism, complexity, uncertainty in their characterization of the today's world.

To understand and to explain how the concepts related with disorder are placed in architectural discourse and how their relationships with science and technology are constructed in a struggle for the creation of a new architectural order are very problematic. Because of contradictions, similarities, differentiations, deformations and indefiniteness in the meanings of concepts, the general situation in the contemporary architectural discourse can accurately be explained by investigating single examples. In this paper, these investigations are explained under two main concepts; "informality" and "dynamism" which match discussions on end-products and design process in contemporary architectural discourse.

Informality

Form has been a paramount concept in architects' interest in the concepts related with disorder for the last several decades. Architects have been interested in the concepts such as informality, formlessness, heterogeneous, and fragmented and conflicting formal systems related with disorder. This is mainly architects' interest in formal orders different from the known. In other words, architects have been in struggle for the creation of formal orders which is not determined in the Cartesian System. In this context, they have superficially taken new theories of science such as; chaos theory, complexity theory, fractal geometry as reference. Using computer technology, they constitute some diagrams which are used to control the formation process. Architect Alejandro Zaero-Polo asserts that architecture may respond to the productive or moral imperatives of the contemporary world by proposing formlessness and indeterminacy as an aesthetic program. For Zaero-Polo, this is a viable solution to the crisis of high modernism.[8]

Jeffrey Kipnis investigates, in the article titled *Forms of Irrationality*, what is (the form of) irrationality? and defines a form process by the example of Peter Eisenman's Biocentrum Project. He asserts that some scientific concepts have a crucially determinative role in the formation of the project: "In the Eisenman Biocentrum project, the initial formal conditions were created by extruding forms drawn from biological symbols. These were then operated on with an amalgam of processes drawn from DNA replication and fractal geometry."[9]

Daniel Libeskind explains the project of *The Victoria & Albert Museum Boilerhouse Extension* by focusing formal concepts such as; labyrinth, spiral, folding, non-cartesian system. He accepts the labyrinth organizational leitmotif constituting a heterogeneous whole.[10] He also explains the structure of the building by referring to fractal geometry as a formal tool;

> "the structure and cladding of the new extension are formed by the 'fractile', a new kind of tile pattern whose economy allows a multiform language to emerge out of an elementary geometric piece,...**This pattern offers endless variation in formal articulation** and the relationship between surface and structure..."[11]

Patrick Schumacher confirms that the most magnificent characteristic of today's new architectural language is its 'complex and dynamic curvelinearity'.[12] With this context, some concepts and some conceptualizations in the explanations of Zaha Hadid Architects' projects disclose the elements of this new design language; incompleteness, seamlessness, strangeness, indeterminancy parametric design etc.

In architectural design, informal effects are mostly produced by the method based on the concept of 'folding.' Folding has been generally used formally with geometrical character although it is discussed with its philosophical root by some architects. It is mainly accepted as an instrument constituting heterogeneous formal orders. Architect Greg Lynn accepts folding as a method for creating a continuous but heterogeneous system including the integration of differences. He writes that; "If there is a single effect produced in architecture by folding, it will be the ability to integrate unrelated elements within a new continuous mixture...A folded mixture is neither homogeneous,..., nor fragmented,...,but smooth and heteregeneous".[13]

Also, Peter Eisenman explains his many projects including, Rebstock project, Alteka office building, Center for the arts, through the concept of folding. He defines the idea of



fold both as an aspect of singularity of the whole and as an instrument to introduce new social organizations of urban space[14] and to reframe existing organizations[15] in Rebstock project. He mentions the folding of different ingredients (lines, continuous surfaces) and a transition between different parts of the programme.[16]

Alejandro Zaero-Polo accepts folding as a method in the application of his aesthetic program based on formlessness and indeterminacy to the process of production, like in Yokohama International Port Terminal project.[17] The usage of the concept as formal tool is clear in the Libeskind's explanation of *The Victoria & Albert Museum Boilerhouse Extension* mentioned above.

Dynamism

The tendency towards the concepts related with disorder in contemporary architecture is connected with architects' interest in motion based - dynamic process of natural order. Defining the social, cultural, economic etc. characteristics of today's world with complexity and dynamism, architects has sought to implementing a new formation of dynamism into architectural design. They have referred to the concepts such as; generic, becoming, morphogenesis, folding, continuity, mutation, fluidity etc. in the definition and the generation of design process which is mostly reduced the process of a form creation.

Patrik Schumacher confirms that Zaha Hadid Architects is forging a new fluid and adaptive language of architecture inspired by natural systems. He expresses Zaha Hadid Architects' this interest as an ambition towards a new organic language.[18] This is concretized via the new digital modeling tools; continuous form-variation.[19] Zaha Hadid Architects' interest in 'laws of nature', 'biological models', 'organic life' is connected with their concentration on controlling the design process by new conceptual apparatus based on new biology. Schumacher mentioned the transformation of the fluidity, pliancy and adaptability of natural systems into architecture.[20] He speaks about bio-mimetic inspirations in their designs;

> "In order to expand our repertoire of geometries, structures, and kinetic systems the design-work is preceded by a bio-mimetic research effort. We are foraging into the world of organic life ... From the various biological models we are extracting geometric systems, envelope systems, structural systems, kinetic systems, sensory systems, systems of aggregation, and systems of communication. It is important to note that this analogical transference from organic life into architectural artefact is mediated by the science of biology. Thus we are furnished with concepts, classifications, and measures that can be transferred alongside the organic model. The science of biology has a rich and nuanced conceptual apparatus for the description of complex morphologies in their relation to functional capacities."[21]

The aim is "to come closer to the compelling beauty of living organisms."[22]

Greg Lynn also explains his concern on motion based processes by determining a metaphorical relationship between organization in biological systems that grow and the process of form creation. He defines dynamic architectural design as time-based manner.[23] To manage a 'time-based' (evaluative) process, Lynn utilises the 'calculus-based' form creation process which is determined by parameters, vectors etc. [24]

Peter Eisenman applies to the concept of 'becoming' in the definition of the building's concept. According to Eisenman, "the building does not represent an essential form but a form 'becoming.'"[25] He suggests a form definition not in Cartesian system, but in continuous development. In order to produce such a continuous formation, Eisenman manipulates the concept of 'folding' as a tool.

Jeffrey Kipnis mentions in the article titled *Towards a New Architecture* that in geometry and science which are basic sources for contemporary architecture, principal concern is towards morphogenesis. Kipnis, like the other designers, focuses on the generation of new formal orders with this bio-based concept.[26]

Maurice Nio and Lars Spuybroek are interested in stability of dynamic systems and their abilities to keep order in a movable situation. They establish a metaphorical relation between human body and architecture in point of their tendency to

development. They speak about 'bio-technical mutations', 'bio-rhythm'.[27]

In recent years, architects have been looking for a new language of architecture, that has been explained under two main concepts in this paper. This new language of architecture includes the concepts related with disorder. It seems to be based upon the injection of some scientific concepts and methods and technological outputs into architectural design. Scientific and technological revolutionary developments providing to solve complex processes of nature and to understand dynamic nature at micro scale have attracted attention of architects as a source of a new architectural language. Although they confirm this interest by different reasons, it is mostly related with their formal anxieties. They have usually reduced theories and concepts of science to the determination of formal order and a design process in architecture. This situation is not new for architecture, similar assertions, struggles, demands, expectations with different emphases were valid for architecture of the beginning of the twentieth century. In this period, architects completely struggled to create a new architecture by the use of scientific knowledge such as; 'non-dimensional geometric forms, four dimensional space' and 'dynamic processes of nature'. One of the differences between two situations is today's architects have an opportunity to concretise their understandings by computer technology. At the extreme level, they have completely produced some projects in digital space. This is real that new concepts have been concretely injected into existing architectural theory and practice.

NOTES

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DISCOURSE ON THE INTERDISCIPLINARY DANCE FLOOR

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Abstract

There is an increasing recognition of the importance of interdisciplinary research, this approach could potentially solve many of the worlds 21st Century research challenges. This is particularly true in research associated with design. This paper reports on Designing for the 21st Century a £6.5 million interdisciplinary research initiative supported by the UK's Arts & Humanities Research Council and Engineering & Physical Sciences Research Council. Between 2005 and 2009 this initiative is exploring design's new emergent position, the roles that the 21st Century designer might perform and the new knowledge and understanding needed to underpin these developments. The paper starts by reviewing the structure of this initiative, its aims and the two phases of research activity, which it is supporting. The interdisciplinary journey taken by 21 Research Cluster projects funded through Phase 1 of the Initiative is then explored; this is described as a five stage process. The paper then reviews four emergent positions for design disciplines in the 21st Century and four new roles that the designer might perform.

Background

In the UK, as in other countries, there is an increasing recognition of the importance of interdisciplinary research. So many problems, issues and opportunities that confront society can only be explored through such an approach. In response, many universities are restructuring departments, schools and faculties to reflect the need to research in this way. These developments on the ground are influenced by shifts in research funding policy, with bodies such as the UK research councils steadily increasing the proportion of funding assigned to interdisciplinary research programmes. In the words of Research Councils UK (RCUK), the body that represents all research councils in the UK (RCUK, 2005): '...novel interdisciplinary research is needed to solve many, if not all, of the next decade's major research challenges.'

These developments apply to all disciplines but are clearly highly relevant to current developments in the discipline of design. In the UK the Cox Review (COX, 2005) has recently reported on the role design and creativity have to play in building the UK's national competitiveness. Like many reports before, the review concludes creativity and design have an important role to play, but only when integrated with technology and business, i.e. driven by an interdisciplinary approach.

If we examine design in the 21st Century we can quickly see why this might be the case, all around us what we are designing is changing. New technologies support the creation and embodiment of new forms of product and service; new pressures on business and society demand the design of solutions to increasingly complex problems, sometimes local often global in nature; customers, users and stakeholders are no longer passive recipients of design, expectations are higher, increased participation is often demanded.

Design practice needs to be highly adaptive and innovative to meet the needs of this rapidly changing operating environment. Generating the new knowledge and understanding needed to support these developments requires a collaboration of

minds and provides some clear challenges for those engaged in design research.

Overview of the Designing for the 21st Century Research Initiative

This paper reports on the "Designing for the 21st Century" research initiative, which is currently exploring design's new emergent position, the roles that the 21st Century designer might perform and the new knowledge and understanding needed to underpin these developments.

This five year programme funded by the UK's Arts & Humanities Research Council (AHRC) and Engineering & Physical Sciences Research Council (EPSRC) aims to support interdisciplinary design research in universities across the UK.

The AHRC and the EPSRC both started considering a programme directed towards interdisciplinary design research in 2002. Following consultation with representatives from the UK design research community the Designing for the 21st Century Initiative was formally announced in January 2004 with a call for Phase 1 research cluster project proposals.

The AHRC and EPSRC have each committed £3.25 million to fund the initiative activities between Jan 2005 and Dec 2009. The total budget of £6.5 million has been split between two phases of research. £1 million has been used to support the Phase 1 research cluster projects; £5.5 million is being used to fund Phase 2 research projects. Across both phases the Initiative has the following aims:

- To foster the formation of a new diverse community with a common reference framework and shared understanding of theoretical concepts, cultures, methods and languages.

- To stimulate new ways of design thinking able to meet the challenges of designing for 21st Century society.

-To support leading-edge design research that is self-reflective, socially aware, economically enterprising and internationally significant.

The Phase 1 research cluster call, announced in March 2004, was launched to support cross-sector and cross-disciplinary networking activities through the formation of research clusters. In doing this, the aim was to build new relationships within the design research community, particularly between design disciplines and groups sharing common ground but with limited previous opportunity for collaboration.

In June 2004, 129 proposals for Phase 1 research clusters were submitted. 21 of these proposals were selected for support by a commissioning panel in September 2004. Between January and December 2005 each of these funded research clusters organised a series of workshops, seminars and meetings to support the development of design understanding. Table 1 provides an overview of each of the Phase 1 research cluster projects; more detailed information on each is available at www.design21.dundee.ac.uk or by accessing the relevant url in column 4 of Table 1.

Cluster title	PI	Institution	URL
Design and Performance	Dr Calvin Taylor	University of Leeds	www.emergent objects.co.uk
Non-Place	Prof Richard Coyne	University of Edinburgh	http://ace.caad.ed.ac.uk/NonPlace
Technology & Social Action	Dr Andy Dearden	Sheffield Hallam University	www.technology andsocialaction.org
Group Creativity in Design	Dr. Hilary Johnson	University of Bath	www.creativityin design.org.uk
The Healing Environment	Dr Jacques Mizan	King's College London	www.the-space-works.org
Spatial Imagination in Design	Dr Jane Rendell	UCL	www.spatial imagination.org
Nature Inspired Creative Design	Thorsten Schnier	University of Birmingham	www.nature-inspired.org
The Emotional Wardrobe	Prof Martin Woolley	University of the Arts	www.emotional wardrobe.com
Spatiality in Design	Dr John Stell	University of Leeds	www.leeds.ac.uk/SiD
Discovery in Design	Prof Ian Parmee	UWE	http://www.ip-cc.org.uk/did/
Design Imaging	Gordon Mair	University of Strathclyde	www.dmem.strath.ac.uk/designimaging/index.htm

Cluster title	PI	Institution	URL
Design Performance	Dr. Jillian MacBryde	University of Strathclyde	www.dmem.strath.ac.uk/desperf
Synergy Tools	John Wood	Goldsmiths College	www.attainable-utopias.org/ds21
Screens and Social Landscape	Prof Gunther Kress	Institute of Education	http://www.lkl.ac.uk/research/design.html
Outdoor Spaces for Young People	Prof. Lamine Mahjoubi	UWE	http://environment.uwe.ac.uk./publicspaces/
The view of the child	Judy Torrington	University of Sheffield	http://vkp.leeds.ac.uk/Drive/gotobuilding.jsp?building=416559
Interrogating Fashion	Sandy Black	University of the Arts	www.interrogatingfashion.org
Sensory Design	Brent Richards	University of the Arts	www.designlaboratory.co.uk
Designing Physical Artefacts	Prof Mark d'Inverno	University of Westminster	www.interdisciplinary.co.uk
Ideal states	Prof Alastair Macdonald	Glasgow School of Art	www.idealstates.co.uk
Complexity in Design	Prof Jeffrey Johnson	Open University	www.complexityanddesign.net

Table 1: Summary of Phase 1 research cluster projects.

During the second half of 2005 the Phase 2 research call was drafted and the Phase 2 research call was announced in January 2006. This was launched to support more substantive interdisciplinary research projects of between 12-24 month duration. Funding of up to £400,000 was available for each project. In April 2006, 65 proposals for Phase 2 research funding were submitted. Following a detailed process of peer review over the summer of 2006, a commissioning panel met in September 2006 to consider project applications. 20 projects were selected for Phase 2 funding. Table 2 provides a very brief overview of each of the 20 Phase 2 research projects, more detailed information on each is available at www.design21.dundee.ac.uk

Project title	PI	Institution	URL
Personalised Fashion Products	Sandy Black	University of the Arts	
Branded meeting places	Prof Richard Coyne	University of Edinburgh	http://ace.caad.ed.ac.uk/NonPlace
Practical Design for Social Action	Dr Andrew Dearden	Sheffield Hallam University	www.technologyandsocialaction.org
DEPtH: Designing for Physicality	Prof Alan Dix	Lancaster University	
Embracing Complexity in Design	Prof Jeffrey Johnson	The Open University	www.complexityanddesign.net
Inclusive New Media Design	Dr Helen Kennedy	University of East London	
Services in science and technology-based enterprises	Lucy Kimbell	University of Oxford	
Stress Computation Visualisation, and Measurement	Dr Wanda Lewis	University of Warwick	
Design Synthesis and Shape Generation	Dr Alison McKay	University of Leeds	
Design Performance: ScoreBOARD	Dr James Moultrie	University of Cambridge	
The Welcoming Workplace	Prof Jeremy Myerson	Royal College of Art	
People-centred Computational Environments	Prof Ian Parmee	University of the West of England	http://www.ip-cc.org.uk/did/
Affective Communication, Personalisation & Social Experience	Prof Chris Rust	Sheffield Hallam University	
Bike Off 2	Adam Thorpe	University of the Arts	
Emergent Objects	Prof Mick Wallis	University of Leeds	www.emergentobjects.co.uk
Democratising Technology	Lois Weaver	Queen Mary, University of London	

Project title	PI	Institution	URL
2020 Vision - The UK Design Industry in 2020	Prof Alex Williams	University of Salford	
Sustainability for Metadesign	Prof John Wood	Goldsmiths College,	www.attainable-utopias.org/ds21
Multimodal representation of Urban Space	Prof Wolfgang Sonne	University of Strathclyde	
The design and refurbishment in schools	Dr Andree Woodcock	Coventry University	

Table 2: Summary of Phase 2 research projects

This paper reports on different aspects of the Designing for the 21st Century Initiative. Firstly, the process followed by the 21 Phase 1 Research Clusters during their 12 months of operation is reviewed. The ensuing insights into design's emergent position are then explored.

Phase 1 research clusters: The interdisciplinary journey

Each of the 21 research clusters supported during Phase 1 of the Designing for the 21st Century Initiative has explored a predefined theme. Each of these explorations represents a journey in building interdisciplinary understanding. Outlined below are some observations on the different approaches that have been taken in undertaking of this work. These are based on the various reports and presentations that have been made by key researchers from the clusters during 2005 and 2006, from the direct observations of the authors in their roles as Initiative Director and Initiative Co-ordinator and from the results of a survey carried out in July 2005 by Maria Panagiotidou a PhD candidate based at the University of Dundee.

These insights are useful at two levels. Firstly, they tell us something about the challenges associated with building an interdisciplinary understanding of design and its knowledge needs. Secondly, they also provide useful insights into the role design based approaches can play in facilitating interdisciplinary discourse. As researchers this knowledge is useful as we will all probably find ourselves working increasingly in collaboration through different forms of network projects in the future.

The original project proposals for each of the Phase 1 Research Clusters provided a plan outlining the process and methods that would be followed in establishing an interdisciplinary discourse into the topic under investigation. During 2005, the clusters held 126 events. 70 of these events were different forms of workshops, 8 involved exhibitions, 18 were symposia or conferences and 30 were meetings focused on planning cluster debate.

Although not made explicit within a majority of the research cluster proposals these activities were designed to guide members of the cluster through a journey of interdisciplinary enquiry. Reflection on the collective activity of all 21 research projects during 2005 suggests 5 generic stages within this iterative journey. An overview of this process is provided below with a summary of the key challenges associated with each stage and descriptions of some of the techniques used by cluster leaders to overcome difficulties.

Stage 1: Identifying Common Goals

Each of the research clusters began trading in early 2005 with a set of goals that had been developed and laid out in the original proposal documentation. An early challenge for each of the cluster leaders was defining the topic of enquiry in an open way that stimulated interest from a wide range of disciplines. Different strategies were used for achieving this. The *Emotional Wardrobe* cluster very carefully chose a very charismatic title to describe their work. Some of the clusters sought to build a very large network of collaborators beyond the originating project team, using the cluster to build new connections. This was exemplified by the *Interrogating Fashion* cluster whose early events saw cluster membership grow substantially to 38 members, all united by an interest in the paradoxes of fashion. Others mindfully kept cluster membership more focused. The *Ideal States* team realised that by focusing their enquiry on the health-related issues of western Scotland, their exploration could be bounded and interaction between collaborators could be more focused, but with a clear intention to gain generic insights for broader application in other situations.

Figures 1 & 2 show the results of two questions that formed part of a survey sent out by Maria Panagiotidou to the members of research clusters in July 2005. Maria sent out a total of 509

questionnaires and received 163 replies. In her questionnaire cluster members were asked a series of questions about why they had joined cluster activities and how they were benefiting from the experience of participating in the cluster communities. Figure 1 demonstrates that the main driver for joining a research cluster was passion for the topic. Figure 2 shows the importance of peers and colleagues in spreading information about cluster activities.

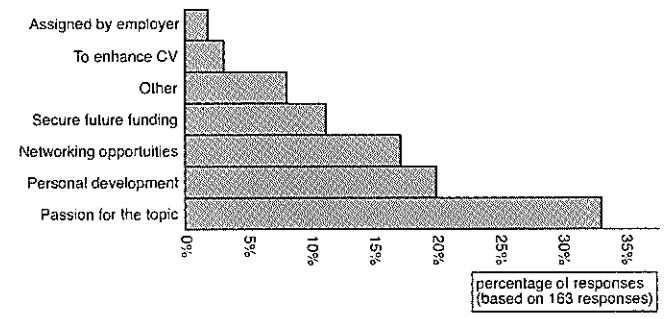


Figure 1. Chart showing the main factor driving individuals to join a Phase 1 research cluster.

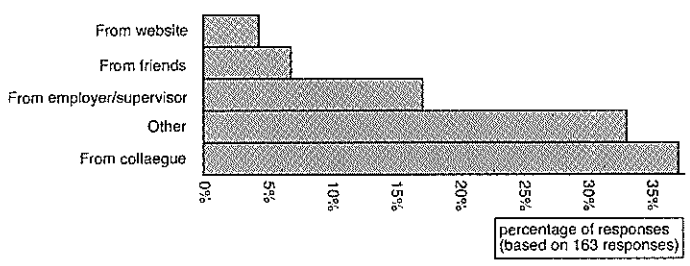


Figure 2. Chart showing the main route by which members of research clusters found about is existence.

Stage 2: Pooling different approaches

Most of the clusters enjoyed the involvement of technology orientated disciplines such as computing and engineering alongside those homed within an Art & Design environment and other areas such as Management, Psychology, Dance, Medicine, Language and Bioscience. All participants shared a passion for the topic under review but had to build respect for the diverse qualitative and quantitative research approaches taken by different cluster members in exploring territory. In most of the research clusters this was marked by an early conflict between rigour and holism. Many of the cluster members represented disciplines grounded in qualitative research methods and practice based modes of enquiry, others developed new knowledge and understanding through quantitative methods. It proved important to spend sufficient time to explain these approaches amongst cluster members. The *embracing complexity* cluster used a programme of 'Complexity Master Classes' to build understanding. Others chose to explore different standpoints by engaging in practical tasks, the *Emotional Wardrobe* cluster for example used a series of workshop activities throughout the 12 months of the cluster operations.

A key observation from this stage is the importance of individuals actually being able to communicate their methods and practices to others, to work in an interdisciplinary manner we must first of all understand our own disciplines. This is an interesting challenge for those engaged in design research where so many methods and approaches are still emergent and poorly articulated.

Stage 3: Building a coherent view

Mapping existing knowledge and understanding within each zone of enquiry was a challenge for each research cluster. As Andy Dearden leader of the Technology and Social Action cluster commented (DEARDEN, 2006):

The early workshops were open-ended struggles to establish coherent clusters of issues from a diverse group that extended from Indymedia activists, through trade-unions to open-source software developers.

Much knowledge and understanding could be extracted from published sources, and a number of the clusters have collated very useful lists of relevant past research material. For example, the Design Imaging cluster who have built a profile of the role of the different human senses in design. For most participants the large body of existing knowledge came as a surprise, as Professor Ian Parmee leader of the Discovery in Design cluster noted (PARMEE, 2006).

Most [participants] were largely unaware of the extensive body of existing design research although being active in their particular areas. The workshops therefore represented an opportunity to

position and understand their design activities within a more global context in terms of associated research.

In some areas of design practice where knowledge was emergent or highly tacit and consequently not codified in a written form researchers within these clusters organised task orientated activities to help participants build an integrated view of territory.

Stage 4: Distilling key insights and questions

One of the core aims of the research cluster activity from the research council's perspective was to help identify the spread of research interests and project ambitions of the design research community to help frame the Designing for the 21st century's Phase 2 project call. Within the workshops and events being organised within each cluster this became a key area of focus in the latter part of 2005. Obviously this was a complicated area to navigate as distilling key insights and questions inevitably meant mediating between the interests and aspirations of individual cluster members. To assist in this process the Initiative Director organised a two and a half day workshop in Glasgow in November 2006 for representatives from each of the 21 research clusters. At this event presentations were made by investigators from all 21 of the research clusters. Delegates also participated in workshop activities designed to help develop an overview of future research ambitions. One of these activities involved mapping potential future research projects from each cluster onto a large floor based 3x3 matrix with axis representing project risk and project priority. Use of this method allowed over 120 future design research projects to be profiled and explored. Figure 3 shows the outcomes from this mapping process.



Figure 3. Images showing how a map of future project possibilities was built by cluster representatives during the November 2005 Reflection and Projection Workshop (Images courtesy of Gus Colvin).

Stage 5: Planning outputs and cluster closure or continuity

Each of the clusters was given funding to operate for a 12 month period. A majority of the clusters used this support to pay for a cluster co-ordinator, to develop a web presence and to pay for organising events and the associated travel costs of delegates. Having demonstrated the potential for research in the topic of enquiry a majority of the clusters used the latter part of their period of operation planning future endeavours. For most this has meant identifying and applying for a portfolio of future grants to support further research. 15 out of the 21 clusters developed bids for the Phase 2 funding round, of which 8 were successful. Interestingly of the 78 Principle and Co investigators associated with successful Phase 2 projects 37 were involved in Phase 1 cluster project activity. Many identified opportunities for funding through other sources, one of the legacies of interdisciplinary discussion being the opportunity to see a broader range of funding sources for supporting research. It will be interesting to map how the interests of the Designing for the 21st Century cluster members manifest themselves in future research bids to councils beyond the AHRC and EPSRC over the next 3-5 year period.

Insights for design

Each Phase 1 research cluster has had its own zone of enquiry and has helped build new knowledge about the act of designing in the 21st Century. When examined at an Initiative level a number of themes emerge from this collection of activity, it will be useful to summarise these as four new emergent roles for the designer.

Emergent positions for design disciplines in the 21st century

Close inspection of table 1 shows the wide variety of topics covered by the discourse within the Phase 1 research clusters. Some of these clusters were located in the context of a particular design discipline, for example *Interrogating Fashion*, others explored generic issues shared by all design disciplines, for example *Nature Inspired Design*. Others examined design's role in resolving issues confronting society, exemplified by the *Healing Environment*. Review of work within all 21 clusters suggests four emergent positions or scenarios for design disciplines (a scenario being a story of what happened in the future). These are described in the following four figures.

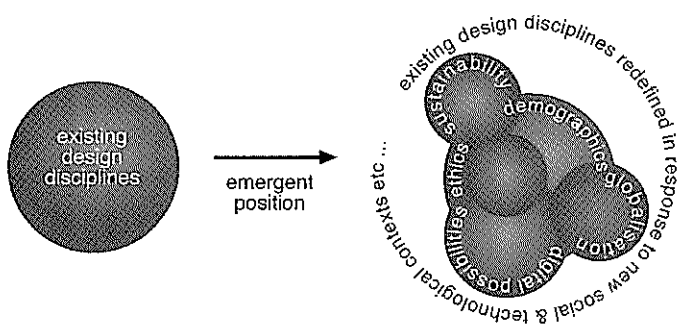


Figure 4. Emergent position 1 – Redefinition of existing design disciplines

One of the research clusters, *Interrogating Fashion* explored the emergent contexts within which fashion design is now operating and the strategies that the discipline of fashion design might follow to make the most valid future contribution. Such a research discourse could be happening within every design discipline, for example, product design, graphic design, engineering design and so on. We have a lot to learn from *Interrogating Fashion* about how to conduct such a debate. Outlined in Figure 4 is a graphical representation of how the boundaries of a design discipline might expand in response to the demands of new contexts associated with 21st century society. Many of the new contexts for every design discipline could be common, a lot could be learnt from comparing the strategies that each might adopt to deal with changing operating contexts.

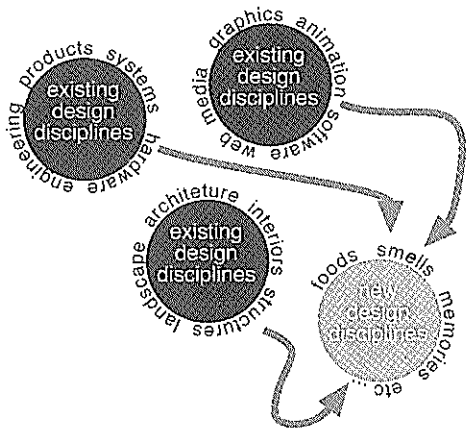


Figure 5. Emergent position 2 – Development of new design disciplines

The next emergent position for design, development of new design disciplines is shown in Figure 5. This position embodies some of the debate generated within clusters like *Design Imaging* and *Sensory Design* clusters. Both these clusters (and others) suggested the emergence of new design disciplines based on the observation that we are designing new types of object, product & system in the 21st century, in the case of *Sensory Design*, potentially the design of the gastronomic experience. These new approaches find their routes in existing design disciplines but roadmaps for future discipline development needs to be identified.

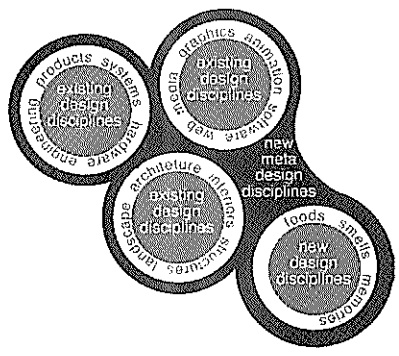


Figure 6. Emergent position 3 – Development of meta-design disciplines

Figure 6 suggests the development of meta design disciplines that act as bridge between existing approaches to design. This development captures the spirit of discourse within clusters like *Synergy Tools* and perhaps the *Emotional Wardrobe*. Here we see 21st Century design being dependent on the evolution of new meta design disciplines that help navigate between existing discipline silos. Again driven by the need for new design approaches to address 21st century issues like sustainability, heath and security.

Finally, Figure 7, explores the development of design outwith design (outwith being a quaint Medieval term associated with being beyond the city walls). Many of the research clusters found themselves with a least one foot in this camp. Clusters like *Ideal States, Technology & Social Action, Embracing Complexity in Design* all explored how design knowledge might be exported and imported across the traditional borders of design. How might design inform healthcare and vice versa, in

the Ideal States cluster Professor Alastair MacDonald explicitly explored design's contribution to healthcare beyond the design of product, environment and communication material. He suggests that design tends to person-centric, healthcare he suggests is not person-centric as we might think but pathology-centric, if we want to understand the export market for design we need to understand the currencies, concepts and values beyond the walls.

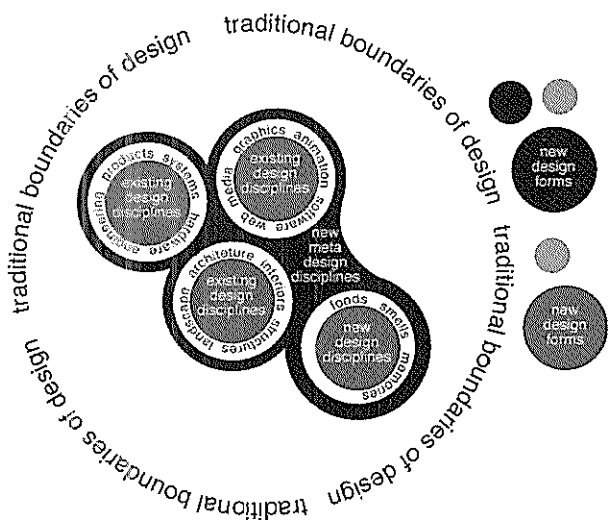


Figure 7. Emergent position 4 – Development of design outwith design

Emergent roles for the designer

Alongside these emergent positions for design disciplines the clusters also suggest many new emergent roles for the designer in the 21st Century. These are probably best thought of additional roles not displacement activities for the widely recognised skills of conceptualisation and synthesis. The four roles described below give a flavour of where the designer might be heading.

Designer as communicator of value

This brings to mind the work of the *Design Performance* cluster, here researchers explored conceptual approaches for assessing design's economic contribution, based on examination of the tangible and intangible impact of design investment. This exposes a core challenge for the designer, communicating their value in resolving issues, particularly outwith the walls of design described in Figure 7. Here the contribution will invariably not be a new product or building or physical entity that can readily evaluated.

Designer as facilitator of thinking

Again another core addition to the designers growing portfolio of skills in a 21st century context. We can see from the clusters that others are being empowered to design. The *View of the Child* captures a child's perspective in the design process. How do we design, design to allow extended participation. The 21st Century designer will need to know how to mobilise and energise the thinking of others.

Designer as visualiser of the intangible

Perhaps more of an extension of existing roles than an entirely new one, the contemporary designer already visualises and synthesises future possibilities but still this role is associated with physical entities. In the emergent positions for design, so many of the challenges might be associated with the visualisation of the abstract and intangible, perhaps the visualisation of systems, relationships, emotions, experiences and networks. The work of the *Designing Physical Artefacts* cluster and others centred on translating concepts from one form to another, particularly the physical to the digital and back again. *Spatial Imagination in Design* explored the translations of the intangible in the mind.

Designer as navigator of complexity

The interdisciplinary world is a world of complexity and ambiguity, work from clusters like *Embracing Complexity in Design*, demonstrated the role design could play in helping us understand complexity in contemporary design, but also the role an understanding of complexity theory might play in helping designers understand their own roles. Certainly the designer with the skills of communication, visualisation and facilitation described above is well placed to act as an interlocutor between disciplines and will ultimately help navigate between issues and solutions.

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GIVING VOICE TO EQUITABLE COLLABORATION IN PARTICIPATORY DESIGN RESEARCH

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Abstract

An AHRC funded research project titled Experimenting with the Co-experience Environment (June 2005 – June 2006) culminated in a physical environment designed in resonance with a small group of participants. The participants emerged from different disciplines coming together as a group to share their expertise and contribute their knowledge to design. They engaged in storytelling, individual and co-thinking, creating and co-creating, sharing ideas that did not require justification, proposed designs even though most were not designers ...and played. The research questioned how a physical environment designed specifically for co-experiencing might contribute to new knowledge in design?

Through play and by working in action together the participants demonstrated the potential of a physical co-experience environment to function as a scaffold for inter-disciplinary design thinking, saying, doing and making (Ivey & Sanders, 2006)[1]. Ultimately the research questioned how this Dr Elizabeth B.-N. Sanders outcome might influence our approach to engaging participants in design research and experimentation?

Introduction

Since participatory design methodology began to take shape [2] the prevalent view of experience as something individual has expanded to include the experience of collective creativity – defined as co-design by Sanders (2002) and co-experience by Battarbee (2003). Throughout the 1980s, understanding of the

[1] This paper deals with one aspect of the Co-experience project Ivey & Sanders (2006) Designing a Physical Environment for Co-experience and Assessing Participant Use to be published in Wonderground (2006), the Design Research Society International Conference Proceedings fully explains the project, includes illustrations from the probe returns and pictures of the co-experience environment. The co-experience environment can.

[2] The historical starting point for the dialogue on user participation began in Scandinavia in the 1960s, and aimed to increase the value of industrial production by engaging workers in system development. This resulted in the Collective Resources Approach (Norway, Sweden and Denmark) in the 1970s. The territory has since been populated by design research conducted in the design industry and academia primarily in the USA, Finland, Sweden, the Netherlands and the UK. One of the first design participation conferences was organised by The Design Research Society in 1971 with proceedings edited by Nigel Cross.

value of user life experience to designing gained momentum and by the'1990s the search was on for new tools and methods of generative, as opposed to evaluative, inquiry' (Sanders 1999:1-2). Methods and tools that acted as *scaffolding* built within and around the design process to support the user as a participant in generating design vision.

> "Scaffolds are communicational spaces that support and serve people's creativity, enhancing the conviviality of their lives. In the future, designers will be the creators of scaffolds upon which everyday people can express their creativity" (Sanders, 2003: 37).

A 2004 contextual search and review into methods and tools to support collective creativity revealed that research based on co-designing or co-experience took place in physical spaces that did not appear to be specifically designed for this activity. Kristensen (2004:7) also referred to the limited address of the physical context of creativity. Consequently, Experimenting with the Co-experience Environment, an AHRC funded research project was launched in 2005 and aimed to create an experience prototype - a physical environment designed specifically for co-experience (Ivey, 2005) that was concerned with the physical/spatial and social aspects of experience (Buchenau & Fulton, 2000). In essence, it was a 'scaffold' designed in resonance with participants - a physical environment where people from different disciplines came together to share their experience and contribute their knowledge and understanding to designing.

The co-experience research questioned how the design of a physical co-experience environment might contribute to new knowledge in design and was conducted using action research methodology. The three conditions (Swann, 2002:55) required by this research strategy are that the subject matter be situated in a social practice subject to change, the project proceed through a spiral of cycles of planning, acting, observing and reflecting in a systematic and documented study, and that it be a participatory activity of equitable collaboration. According to Swann, in employing action research methodology, there is often a shortfall in addressing the third condition.

Rather than a participatory activity of equitable collaboration, participant involvement is conventionally imbedded in the research as data, analysis or findings and participant contribution is anonymously acknowledged. The co-experience environment project was configured intentionally for a small group of participants with shared expertise to allow the research, in the longer term, to explore equitable collaboration in participatory design research. As the research progressed, the participants agreed to reflect on their engagement and to collaborate in disseminating the research outcomes.

This paper deals with one aspect of the co-experience project. It gives voice to the participants who, for the most part, are academics engaged in research in their own fields. Their writing style and their tendency toward personal view are perhaps an interesting departure from what might be perceived by some as normal for an academic paper. It is too early to say conclusively whether or not giving voice in this way represents a value or equity in participatory design research. An exploratory exercise, the outcomes offer an insight with regard to the value of equitable collaboration and the findings provide tentative proposals that might influence our approach to engaging participants in design research and experimentation.

Co-experience and Equitable Collaboration: Selecting Participants and Designing

Pre-knowledge, gender and age were the three main criteria for selecting participants. It was crucial that all participants shared expertise in a particular area to establish a common base for the group who emerged from diverse sectors - accounting and finance, applied computing, architecture, design, fine art, law, and town and regional planning. Ultimately the group was comprised of three female and three male participants and spanned two of Peter Levine's age classifications (Schmitt, 1999:228), the Us (34-52) and I Generations (24-33) with all group members sharing expertise in the field of environmental sustainability.

A simple probe[3] pack was designed for the initial phase of the research, using the criteria established by the Luotain Project

[3] The probe approach (Gaver et al 1999) is a method for engaging in a visual based distance- dialogue with users to provide insight for design creativity.

(2002) as a guide.[4] The guiding principles for the design of the co-experience environment were the four phases of creative thinking with their convergent and divergent characteristics (Schmitt 1999:146). According to Csiksezentmihalyi (Schmitt 1999:147) the convergent phases require familiar, comfortable surroundings with the divergent phases better suited to novel, beautiful surroundings. Without revealing the guiding principles or the participant cohort, the probe package was sent to each participant to establish individual perspectives on their thinking/working environments. Where did the participants think/work and what characteristics of their environments were evident in their probe returns? Essentially a record of individual experience, the probe returns – a combination of image and text - were analysed for similarity and difference and collated to construct an overview.

The findings revealed a high degree of similarity, identifying six main themes in the participant's private thinking environments. Perhaps unsurprisingly for a participant group with expertise in environmental sustainability, nature was a determining factor in their thinking environments. Characterised (in descending order) as nature, activity/motion, visual characteristics, social interaction, time/privacy, and sound present or absent in their surroundings, these characteristics were interpreted and proved elemental in developing the design concept for the co-experience environment– a design concept[5] that was guided by an empathic connection to the participants, cothinking with them through their probe returns (Fig. 1).

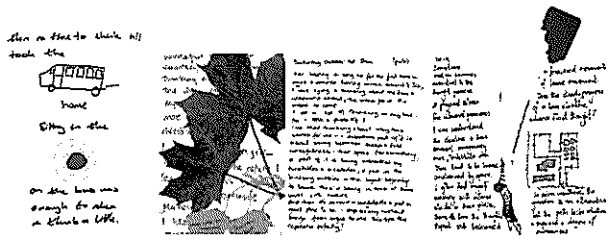


Figure 1. Sample pages from the participant probe returns. The returns were analysed for similarity and difference and collated to construct an overview and inform the design decisions for the co-experience environment.

On the 6 December 2005 six[6] participants met together for the first time as a group and used the co-experience environment for a three-hour period. Following a short briefing and individual exploration of the space, they were called together to play a bespoke game designed to accommodate an element of play (Ivey 2001) as well as to create common understanding and structure activity (Brandt & Messeter 2004). The game was essentially a dice and a set of cards (Fig. 2). The participants took turns throwing the dice, which randomly prompted them to select a series of instructional cards, take another turn or tell a story.

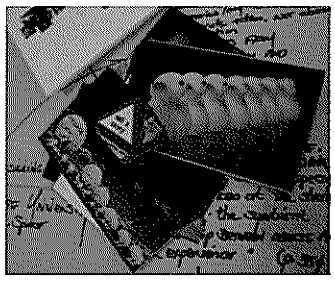


Figure 2. Co-experience game, cards and dice.

[4] The Luotain project guidelines recommend probing twenty to thirty individuals. The Co-experience Project contacted forty-two people with expertise in sustainability and sent probes to eight people.

[5] The design decisions for the co-experience environment were rooted in the participant probe returns though it is not possible within the scope of this paper to be explicit with regard to each design decision. For more detail please see Ivey & Sanders (2006) Designing a Physical Environment for Co-experience and Assessing Participant Use to be published in Wonderground 2006, the Design Research Society International Conference Proceedings for more detail. The paper communicates the methods used to create the co-experience environment, prompt coexperience and assess participant use of the co-experience environment. The paper will also be available from www.creativekit.co.uk and www.maketools.com

[6] Three of the eight participants planned for the experiment declined forty-eight hours before the experiment began. The experiment could progress without difficulty with six participants but not five. Yue Li, project assistant for the design of the co-experience environment met the criteria for participant selection. She agreed to act as the sixth participant, remaining highly professional throughout. The integrity of the experiment was maintained.

Using different cards at different times the, participants selected the places (Fig. 3) in which they wished to work individually, in pairs and ultimately as a group, ending with a walk-about debriefing, a social buffet and a take-away card that asked the participant to 'make something that was a reflection of their co-experience' and to feedback at a later date.

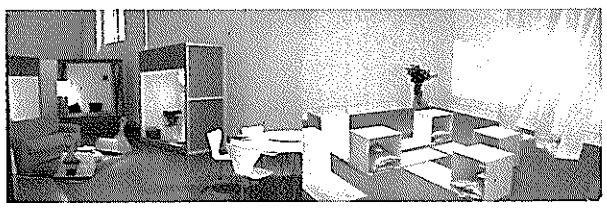


Figure 3. Views of the Co-experience Environment 'comfortable, familiar' zone on the left and the 'novel, beautiful' zone on the right.

Here the participants take another turn at storytelling[7]; their reflective vignettes give voice to their experience as a participant in the co-experience environment research.

Elizabeth Kirk: Contribution and Curiosity

I chose to participate in the co-experience project for two reasons - a desire to contribute something to the broader research community and curiosity. What could I, a lawyer with the drawing skills of a tipsy spider, contribute to a design project?

Co-experience Probe - I assumed that we'd meet and talk about ideas for design, but the probe pack disabused me of that notion and left me none the wiser as to what I could contribute. If anything I was a little intimidated. We seemed to be encouraged to draw or make things and use these things to illustrate or compliment a diary. Yet I had only words to contribute, or at most the pictures I could paint with them.

Worse was to come – we had to complete our probes within a set week which turned out to be one of my busiest weeks of the year, so I didn't even have time to paint pictures with words. I felt as though I was skimping on my contribution and that the designer would have nothing to work with from my probe, so I tried to cheer it up with some simple drawings using the coloured pens we had been given and hoped that what I submitted would be of use.

But I made a discovery of my own while keeping my diary - it made me think about how I used time. I had always been careful to manage time and use it effectively, squeezing as much as I could out of each day, but my diary showed me that squeezing was a bit of an issue for me. I needed space to think – physical space and space in time.

I had gained something but not what I had expected. I thought I would learn about design, instead I submitted a paltry probe with poor pictures and not much else. This was going a bit against the grain – a lawyer never asks a question if they don't know the answer and every research project is carefully set up to ensure that the findings are manageable. I hadn't quite met the standards of a good lawyer.

Co-experience Environment & Activity - It was with some trepidation then that I went to the co-experience experiment. And yet again I found I was being asked to do something different – play a game that appeared unrelated to the task at hand. Lawyers are used to playing games, but not of this sort. We were telling tales unrelated to work. Again lawyers are used to telling tales, but we were asked to reveal something of ourselves, something a lawyer never does. Nor do lawyers talk about issues unrelated to the case at hand, which is what the co-experience environment asked of us - at least at first.

Then came "the real work" we were sent off to find a space to work in to design something[8]. I sprinted off, absolutely

[7] All writers received a briefing paper in June 2006 which included the aims and objectives for the paper, the EAD conference website, a draft abstract, timetable, writing plan, writing prompt and a walkthrough video of the coexperience space as an aide memoir.

[8] At the end of game play the participants held six game cards to be used throughout to prompt co-experience activity. The game cards contained pieces of information that the participants were to use, either individually or in pairs, to explore design opportunities in their field of environmental sustainability. These cards were designed to align activity with phase model guidelines 'for how a creative process may consist of different phases; preparation, incubation, illumination and elaboration or evaluation' (Kristensen, 2004: 8).

sure that everyone would want to work in the same space as I did and I wanted to have a spot for me. When I got there no one else had joined me in the new space[9]. All the other spaces looked like extracts from rooms, this was an extract from outside and utterly beautiful. It was easy to relax and get down to thinking, easy to find some inspiration on the walls when thoughts were thin and, most of all, it had the most fantastic wiggle space. I could wiggle and shuffle and change position to my hearts content while I worked. Why was no one else here? Well, who cares? I enjoyed working there.

We came back and had to share our ideas. Can you imagine a lawyer being asked to share his/her intellectual property before all contracts are in place? But I did - beguiled by the space, the play and the wiggle room into sharing and enjoying the fun of the conversations.

Part three of our participation in the experiment involved discussing our individual ideas with a colleague and coming up with a project that combined some elements of each idea. Again, in the surroundings and the ambience this was easy as was sharing these joined up ideas with the broader group. And now, at last, everyone came through to the new space and used the furniture in their own way. It was refreshing and relaxing and an enjoyable place in which to interact.

Outcomes - We debriefed and enjoyed some hospitality and then departed. I returned to the coexperience space as many times as I could that week. It was a good place to think and work. It made me think again about the need for space in my life, open space, quiet space and simply breathing space in which to think without deadlines, teaching prep or phone calls. As it happened I was also in the housing market and the co-experience space made me reassess what I wanted in a living space (to great effect I might add – I love my house!). I reconsidered organisation of my work and the need to create space in time for thinking. I even reconsidered how I travel to work. Now I cycle as often as possible: a more sustainable mode of transport than driving.

Lastly we had the 'take home make it' task to complete. Now I was in the swing of the co-experience project I saw this as an opportunity to have fun while getting ideas across. Others who looked at what I had made suggested I had not taken the process seriously, but I had - a serious point can be made in a humorous way. Now that is something that is lacking in legal research on environmental issues. And that is something to pursue. If I take anything away from this to my own research it is to remember to have fun in doing it, and remember that writing can be entertaining as well as informative.

So I started this process curious, I thought it would be good to give something to the wider community and I ended up reflecting on how I think and work and on what it takes to make both living and working sustainable for communities and for me personally.

Ian W. Ricketts: Refreshing View

I am an engineer by training and a computer scientist by trade. I collaborate in a range of research projects with colleagues from a variety of specialties but almost all are scientists. They include anaesthetists, biologists, dentists, general medical practitioners, nurses, pathologists, physicists, psychologists, statisticians and surgeons. So not only do we share a common language, but we also share a similar approach to research. When I am not at work I enjoy a little excitement in my life. I sail and race a single-handed dinghy that has more sail area than is sensible and consequently I swim quite a lot. I also own a sports/tourer motorcycle, which has taken me to the Alps for the last two summers.

Recently life at work had been dull and so an invitation to collaborate with a group of folk including non-scientists, under the leadership of a designer based in a School of Art & Design, promised to be an adventure that I could not refuse.

The motivation was not solely one of a search for excitement. I was also looking to refresh my view of research. I have spent the last twenty years leading research projects and I thought it would be stimulating to engage in a role in which my research

[9] Elizabeth was the only participant who chose to work in the 'novel, beautiful' space during this divergent thinking phase and consequently the only participant to support Csiksezentmihalyi's (Schmitt, 1999:147) hypothesis at that point in the co-experience activity.

expertise was not immediately relevant but in which I might be able to contribute as a team member. I hoped it would give me new insights, which I could bring back to my other research activities.

I am based in a school of computing and my teaching roles include teaching first year undergraduates about software development using the JAVA programming language, introducing third year students to Human-Computer Interaction and fourth year students to Industrial Team Project Management. I also contribute to a joint degree in Interactive Media Design with colleagues in the School of Design, but my involvement does not require me to extend beyond computing. Via the Co-experience project I hoped to explore aspects of design, which as yet I had not explored, and which I hoped would offer further opportunities for collaborative research.

An almost inevitable consequence of growing older in academia is that life becomes busier and it gets increasingly difficult to set aside time to explore new opportunities. Engaging in the Co-experience project required me to make time available to explore and hopefully develop an outline research proposal. Lastly I thought it would be fun (and so it was).

Co-experience Probes - Prior to meeting with my fellow collaborators I was asked to contribute an insight into how/where/when I developed my research ideas. To assist in gathering these insights a 'probe' was provided in the form of a disposable camera to capture images of those environments that I found to be most productive and a range of items to help document the research opportunities as they happened e.g. colour pens, sticky paper, small notebook, etc. The accompanying advice was to use the probe materials if they helped but not to be constrained by them. I am completely unfamiliar with the use of this approach to capture events. I spent some time trying to use of probes and after some false starts I finally resorted to a much more familiar tool of drawing a Mind Map of my 'Research Opportunities'. I understand that my response to the probe, together with those from other contributors, informed the design of the space in which we subsequently met and collaborated.

Co-experience Environment & Activity - So the day came when we met as a group in an environment constructed purposely to assist us in our collaboration. Following introductions, and an exploration of the range of workspaces, we participated in a game to build relationships based on sharing personal stories prompted by the random turn of a card. This 'ice-breaker' was both entertaining and effective. After a relatively short time I felt at ease with my fellow collaborators and having exchanged some of our experiences I gained useful insights into their interests and motivations. Each collaborator then suggested a research area, which we discussed in small groups and then refined, based on the feedback provided in those discussions. Subsequently potential opportunities for pairing of proposals were identified and the two collaborators discussed what opportunities there were for implementing the planned research.

Outcomes - The research idea we developed collaboratively has not yet emerged as a funded project but the benefit of using this style of collaboration to generate ideas has resurfaced. I recently attended a UK research council event at which twenty-five people (out of 120 applicants) were brought together for one week to explore and assemble competing research proposals for a fund of £1.5M. The event was termed a 'sandpit'. The group I contributed to was awarded a grant of £0.5M. I believe that group's success was in part due to what I gained from Experimenting with the Co-experience Environment and I expect there is more to come from my relatively small investment.

Lorna Stevenson: Creative Accountability

A posting on Hermes, our University's weekly distribution of messages to staff and students triggered my interest and involvement. I'd recently had some fairly invasive medical treatment and was very open to trying new experiences and trying to think about aspects of my life in new ways.

Co-experience Probes - Elements of the wording of the invitation intrigued me – social interaction, sustainability, and cultural probe package. On receiving the probe and hearing what was required of me, I felt excited – excited by what I might learn about myself, excited by the possibilities of 'being creative' (the discipline of accounting is not positively known for its creative members), excited by the prospect of working with new people on a new project,

and excited by the idea of working with non-accountants on 'real' academic research.

However, I also felt a little daunted by the contents of the probe – the creative materials such as coloured card, colouring pens and camera are not a part of my daily work materials. Nonetheless, the project's edict to 'have fun and to make it fun' gave me enormous comfort; and so too did my belief that I understood intellectually what was required of me. Thus I would ensure that my contribution met the brief, as I understood it, even if it wasn't what was expected.

The analogy of the probe as being like an instrument sent in by scientists to collect data from distant planets was also a good way of the researchers conveying their expectations.

I deliberately thought about what I was doing that week, and attempted to note when I was thinking and which aspects of my environment were impacting on my thought processes. It is a challenge to attempt to convey an impression of what thoughts one is having and why – possibly more so if one is not familiar with the one conveying, their habits, daily routines and way of being.

I am particularly interested in accountability – as a teaching topic, in terms of my own conduct, and as an area of research. It seems to me that the study and practice of accounting is inextricably bound with ideas of accountability, and through this, with sustainability. Thus, with hindsight, I believe that accountability was a major element in how I interpreted and delivered on the brief.

In this context then, several elements of using the probe are worth highlighting.

- The extent to which, through using it, I became aware of how my environment influenced my thoughts – this was new for me. I did know that I find it difficult to think if I perceive an environment as noisy, however I was not much aware of any significant aspects beyond this.

- The challenge involved in trying to convey my perceptions of which aspects of my environment affected my thinking in an unambiguous (relatively) way.

Co-e*xperience* *Environment & Activity* - On the day we interacted with the created environments. It was very interesting to see the analyses of the probes, the findings that had been derived from them, and especially the spaces designed from the process. I enjoyed thinking about which (if any) aspects of my probe return were manifest in the spaces.

I didn't really know what to expect from the day, beyond being asked to interact in the created spaces and to respond on that basis. I was certainly unnerved by some of the 'game' requests, e.g. tell a story, but in retrospect I recognise that the game was a clever way for us as a disparate group to necessarily a) get to know a little about one another and b) have a focus for engaging with the spaces created.

I was pleased and surprised when I realised that a friend and colleague was also involved in the project as I looked forward to seeing their contributions and unpicking them in terms of how I understood the person. We agreed to hold our next work meeting in the co-experience space and that too provided insight into both my colleague and into the space itself.

Our initial task on the day was to think for half an hour alone on an allotted task. I made a beeline for the bed space[10], expecting to have to fight off others who would want it. I loved the comfort it afforded and the ability it offered me to sit in a way other than normal i.e. with raised legs.

Outcomes - In conclusion, I am more aware of the qualities of space I like to work and think in and I pay more attention to space when I am now thinking and working. The experience was wholly enjoyable, fun, involved learning and meeting new people, and resulted in my seeing in a new way. This for me is a true test of whether learning has occurred.

Mark *O'*Connor: Architectural Perspective

As an Architect with experience of both practice and teaching

[10] Prior to the co-experience activity we felt that perhaps the bed was too intimate a space for anyone to choose. It was so satisfying to see Lorna making such a determined bid for the space especially as it had been inspired mostly by her probe return.

I was intrigued by this project exploring the impact of shared environments on users. During the exercise participants were asked to consider the experience from the position of their own discipline. On reflection it occurs that architects rely heavily on co-experience in the design and realisation of complex building projects, as these require the co-operation, communication and co-ordination of many disparate individuals and groups for successful completion.

Co-incidentally, during this period the second year Architectural students, with whom I was working, were asked to participate in a project that provided insight into coexperiential processes. Student groups of twenty were asked to design, manufacture and build a demountable structure for outdoor performances.

Group size was an issue: twenty individuals initially proved dysfunctional and broke down into task specific groups of four and five. However, as the structure/artefact developed it appeared to affect group behaviour. Its physical presence seemed to hold clues and prompts, creating a framework that helped organise language and actions. With this device, in the final stages of construction the entire group was able to function as a single cohesive unit.

Co-experience Probe - Observations of this project accorded with many of those made of the Co-Experience Environment, the first stage of which was the probe, a lovely bag of bits to play with. At first, irresolute about what to do, the exercise came to life when I started cutting the pages of the sketchbook. The probe then became an investigation of the space within a book, holding pages at different angles and in different lights to observe variations in the translucence of and shadows cast by combinations of cut sheets.

This outcome was strongly influenced by the working environment, a comfortable corner of a spacious room, lit by strong directional light. While thinking about the probe, I had been pacing in the space and developed an awareness of the effect of the light on the pages. This behaviour, the process of making and the physical environment became increasingly intertwined in the act of making the sketchbook.

This stage was very useful in forcing me to observe and understand my working practices. Notable was a curious nesting behaviour, a calm centre from which paper, scissors etc. radiated out in a confused arm length clutter. Also, the importance of movement to my thought process became apparent - I now have a greater understanding of cloisters.

Co-experience Environment & Activity - I was curious on entering the Co-experience Environment. The communal part of the process was staged within a room set up to allow different patterns of interaction. I found myself constantly looking for clues to the design decisions that led to the creation of the environment and wondered, as a participant whether or not this design educated curiosity was an advantage or disadvantage.

After familiarising ourselves with the environment our first group task was to get to know something of each other. This process was highly structured, using a dice game set at a round table (without hierarchy) taking turns where each person might have to tell a story. Use of a game was interesting; contests like tug-of-war demonstrate the potential for games to channel and focus human activity. Here, venue and game generated a structure that helped reduce social uncertainty and allowed people to relax and bond in the shared discomfort of enforced storytelling.

The game generated individual design tasks carried out, initially alone, in a location of our choosing within the space. My choice was quite formal, almost a café table within an enclosed defined area somewhere between the very domestic arrangements and the beautiful minimalist space provided. I find group situations difficult and my choice of enclosure may have been a reflection of this.

After further work in pairs, the group assembled in the minimalist space for the final stage. Here the sitting area was designed using seats stripped of explicit meaning while affording the possibility of use in a number of configurations. These seats were placed randomly with no suggested pattern of use. Interestingly this seemed to imply an initial group task to discuss the seats and agree a common method for using them and so almost to agree a group identity that would help establish the pattern of discussion whether formal or informal (Fig. 4).

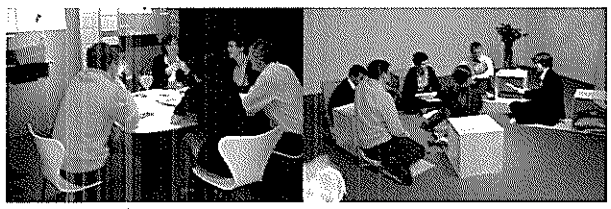


Figure 4. (Left) game play in the 'comfortable, familiar' zone. (Right) Participants selected the 'novel, beautiful' zone for their final group discussion.

Outcomes - Ultimately a very engaging experience and one that I think will inform my design thoughts. As an architect I am inherently convinced that environment impacts on behaviour, but was very interested to observe this so clearly in both the individual and group stages. I gained some insight into the difference between individual and group working environments e.g. movement is normally important to my thought process, but was entirely suppressed during the group stage possibly through consciousness of disruption to others.

Introduction of activities like the game set in specific physical environments was thought provoking. In particular, combinations of both structured and informal settings/ activities seemed to offer essential variations of group support at different stages.

Yen – Chiang Chang: Thinking and Working

The basic theme of my PhD research is the concept of sustainable development. The university campus is my usual thinking\working place – I think as I move about the ampus and frequently work in one of the university libraries. After receiving the probe package I encountered an advertisement "great design need not cost the earth" posted on a wall near the university precinct. This triggered me to think of whether the campus was designed to meet the needs of the present, without compromising the needs of generations to come.

Co-experience Probes - Using the camera and a notebook from the probe pack I began to record my observations regarding the over use of paper on campus - universities are said to be one of the biggest paper consumers. Water, was another issue worth addressing, as was the absence of a recycling facility on campus. These observations led to some recommendations for improved paper and water use. For example, embedding a spray mechanism in all campus taps might improve performance regarding water usage sustainability.

Co-experience Environment & Activity - The experiment was to be carried out at Dundee Contemporary Arts and I did not realise that the location of the area designated for the experiment was a flexible open space used for research in the Visual Research Centre. I thought that the coexperience experiment would be part of an exhibition so I arrived early and this gave me extra time to understand the location.

After a brief introduction and a period of exploration we were called together to play the bespoke game that was a good exercise for 'ice breaking', since all of the participants were from various backgrounds. A better way of learning about others is by listening to others' stories - I had the opportunity to tell three stories in relation to my personal experiences, even though I would have preferred to sing![11]

At the second stage of the experiment, we were sent away individually to think and design. My idea was for a poster that would be understood by 9-14 year old children and could be placed in a public place such as a telephone box. Keeping in mind that children may be more attracted by pictures rather than words, I drew three pictures to more easily pass the sustainability message to children. It is recognised that where a person works might have an influence on his/her views and therefore, each participate was free to choose their own work location within the co-experience environment. I selected to work at a coffee table because I am used to working with a cup of coffee at my side.

For the next stage, I worked with an architect, Mr. Mark O'Connor. We firstly spent some time discussing our individual missions,

[11] The game is essentially a dice and a series of instructional cards. The dice is thrown and instructs the player to pick a particular card or to 'tell a story'. An early prototype of the dice included an instruction to 'sing a song' but prototype testing revealed that players were mostly uncomfortable with this and it was eliminated from the coexperience game. In the debriefing sessions we spoke openly with the participants about the different design iterations for the co-experience experiment

identifying the similarity and concluded with Mr. O'Connor making a pictorial representation of the two missions. This experience emphasised the importance of drawing consensus when working as a team and suggested that teamwork is more interesting and stimulating than working alone.

At the end of the experiment, three groups were asked to sit down and express the outcomes of their work. This was more of an 'information gathering exercise', from the participant's point of view. This experience demonstrated how difficult it is to achieve a consensus within a group, in particular, where various backgrounds, interests and viewpoints exist. In the end, the experiment was thought to be 'interesting' and 'inspiring'. For myself, it was refreshing to be involved in this project as it provided the opportunity to be involved in something quite different from my taxing legal research.

Outcomes - As I understood, one of the central focuses of this experiment was how different environments affect people's thinking. The fundamental assumption was built upon different people from various backgrounds with variable thinking approaches. What if there had been a group of people from a similar background or interest? Would the outcome have been different? With this question in mind, my response to the 'takeaway make it card' was a power point presentation where I used the analogy of differing tactical and strategic approaches used by competing badminton teams as a way of addressing my questions. My findings seem to suggest that, even if an individual member of a group came from a similar background and held a common interest, they would still hold an individual view. To this end, the outcome refers back to the research question that co-experiencing can contribute new knowledge in design.

Conclusion

The Role of the Environment in Experience - It was new for most of the participants to think about and be explicit about how the physical environment influences their thinking. They began to cogitate, using visual and linguistic modes to express the role of their environment in their thinking. Lorna explained that "I am more aware of the qualities of space I like to work and think in and I pay more attention to space when I am now thinking and working". Mark, the architect, was quite explicit about how the physical environment or artefact influences thinking and designing. As a designer and design educator he acknowledges a familiarity that he questions. The non-designers demonstrated a noticeable tendency to experience the experience. The unfamiliarity of the co-experience experiment appeared to 're-move' all of the participants to reflect on their life experience and make a discovery.

One might argue that their experience was heightened because they were confronted with the unfamiliar. Presented with something familiar, one tends to respond with familiarity – a discourse of informed use. However, when presented with something with which one is not so familiar (as long as it is not too scary), one responds with curiosity - a discourse of discovery. For the participants this lead to the creation of new experiences.

The role then for the physical environment in experience is for it to be designed in a way that 're-moves' participants from their everyday experience and offers them the opportunity for a discourse of discovery.

Experience Takes Place in Space and in Time - The focus of the co-experience environment was to explore the physical/spatial and social aspects of experience and that it did. But it also became clear through the experiment that the temporal aspect of experience is equally important although perhaps more difficult to control. Experience is situated in a larger contextual frame of space and time – experience becomes an experience and people do not perceive space and time as being separate. A physical environment can stage a timed experience, but this experience steeped over time becomes an experience (Forlizzi, 2002) and unfolds in meaningfulness. The integrity of time and space is revealed in Elizabeth's statements; "I needed space to think – physical space and space in time". "I reconsidered organisation of my work and the need to create space in time for thinking".

The participants in the co-experience experiment told stories at different times – stories about their past, stories about their design vision and ultimately in this paper, stories about their whole experience to date. In essence the co-experience environment timed people together in a 're-moving' experience and over time they have connected their experience of the co-

experience environment into their daily lives (e.g., Elizabeth and her new house, Ian and the UK research council event).

They came with an idea that they would do something different or learn from this experience. This idea was confirmed; their experience was the foreground.

Scaffolding, Experience and Collaborative Equity in Participatory Design The scaffold for the co-experience environment consisted of many steps over time including:

- an invitation to enter the experience.
- completing the probes, which invited curiosity and provoked reflection.
- once participants came to the environment, they were curious to see what had become of their returned probes.
- the bespoke game was at first uncomfortable, but the participants quickly recognized it as being essential for getting to know one another through storytelling.
- they interacted through design activities in the co-experience environment, both alone and together.
- some of them returned to the environment over the next week.
- they completed their take-away 'make it' task and met again two months later to share outcomes.
- they reflected on the experience as a whole and continued their participation as co-authors of this paper.

Scaffolds for experiencing must consider both space and time. They work best if they are connected directly to the past, current and future lives of people and include a level of unfamiliarity that does not inhibit. It is essential that if familiar environments are used as design scaffolds that they do not conflict with participants' received ideas of place and space. In the re-design of existing physical environments for coexperiencing, the researcher needs to build a bridge for the participants to allow them to quickly comprehend changes in the context of use.

Designing for experience environments may have to consider the different approaches that participants use for reading environments and guide the participant to use the full range of their sensorial reading ability. A coherent environmental narrative - similar to product narrative - should be imbedded in the design of the co-experience environment, so that participants can fully experience the environment.

The participants' experiencing of the co-experience environment went far back and beyond what happened to them in the three hours they spent in the environment. In reflecting on their experience, they told a story about the entire experience as it happened over time, starting with their response to the initial invitation to join the adventure, then moving to the probe package and onwards.

We have learned that:

- non-designers enjoyed the process and they could quickly apply their new experiences to their daily lives traditional researchers are open to new paradigms of research (e.g. they learned that having fun in doing research is a positive thing).

- probe assignments and seemingly unrelated game playing is provocative. These activities made the non-designer participants feel "unnerved... intimidated" but also "intrigued and curious". It was surprising how different this way of thinking was for them.

- we need to be aware that people respond to open-endedness in many different ways. We, in turn, need to be open to letting them interpret our instructions in such a way that they are able to respond (e.g. Ian's Mind Map).

- we learned that immersing non-designers in the design process through the coexperience environment was successful. It caused them to think about thinking, to open up their thinking and to be more deliberate about where/how they use their time and space. It also revealed to them new ways to approach research.

We know that for design research to attend to the complexity of real world scenarios it needs to work with interdisciplinary teams of people and engender collaborative equity. Through this research we explored different approaches to scaffolding the interdisciplinary design experience, experimenting with

methods that can be used to bring together people who might wish to collaborate. It suggests a process for introducing what it is that design research does to a wider research community and offers an approach to establishing a dialogue of interdisciplinary learning and understanding.



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FLOW AND THE OPTIMAL EXPERIENCE OF THE AMATEUR DESIGNER-MAKER AND DO-IT-YOURSELF ENTHUSIAST

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Abstract

Although 'do-it-yourself' (DIY) activity has played a key role in the development of the material culture of late twentieth century Britain and America, it has been paid a limited amount of attention by academics and researchers. This study reviews attempts to understand DIY activity, and finds that the problem of defining the field, together with a tendency to focus on the results of DIY, rather than the process, has hampered enquiry. DIY ranges from simple home maintenance through to the production of sophisticated artefacts, and whilst utilitarian and rational motivations partly account for the former, little work has been carried out on the self-actualising potential of the making of objects in home workshops. To some extent these activities are united by their inclusion in the category of leisure, and this research considers how people attempt to regain sense of personal agency through these amateur craft pursuits. Csikszentmihalyi's 'flow' model is applied to accounts of amateur making in order to more fully understand the motivation behind 'extreme DIY', and an understanding of amateur making as an autotelic, or intrinsically rewarded activity is reached.

Introduction

The roots of the project lie in research carried out during 2003 and 2004 into the Mirror Dinghy. The Mirror Dinghy was conceived in 1962 by Barry Bucknell as a kit boat for amateur woodworkers. Users could order a kit boat that was then assembled at home in garages, or even living rooms, and could be sailed within weeks of starting the project. Over 70,000 of these boats have now been built, and are distributed worldwide. Bucknell was the first popular 'do-it-yourself' (DIY) expert, appearing on television programmes throughout the 1950s and 60s, and he played a major role in the popularisation of home improvement as a leisure activity. The research found that the self-build design of the Mirror dinghy coincided with a rise in interest in DIY, and that with increases in disposable income, greater leisure time, and improvements in lifestyle, the boat served as a unique introduction to the sport of sailing for thousands of people. It marked a confluence of a variety of historical factors: changing social and cultural conditions, developments in manufacturing technology, the importance of newspaper and magazine publishing – and even television celebrity. The research explored the growth of do-it-yourself in post-war Britain and proposed that the general increases in the levels of skill and ambition of domestic householders – and a change in the perception of do-it-yourself from an activity borne out of necessity, to a means for self-actualisation – created the conditions in which the Mirror dinghy could thrive as new product.

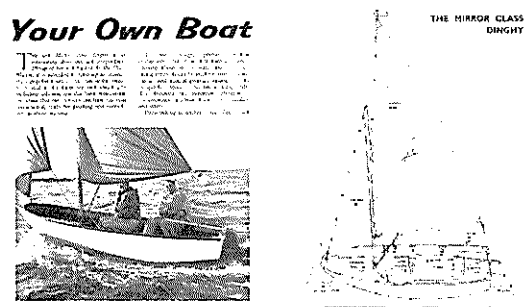


Figure 1. The Mirror Dinghy featured in a 1963 introductory book to sailing, (John Mills (ed), The Uffa Fox Book of Sailing, Longacre Press, 1963. pp146-147).

Accounting for DIY

One observation that became apparent early on in the research was how little work had been carried out in the area of do-it-yourself and amateur making activity, particularly in the UK. Judy Attfield (2000: 73) acknowledges that 'DIY is an aspect often mentioned in passing, but still not accorded much attention by design historians', whilst Paul Atkinson (2006), editor of a special issue of the *Journal of Design History* devoted to studies of DIY, believes one of the reasons that do-it-yourself has rarely been examined in published studies is the problem of definition. There is uncertainty about where it should sit in relation to the discourses of art, design and craft. The phrase DIY means different things to different people. The common-sense understanding of the term DIY (in both the UK and the USA), and the angle taken by a large proportion of the published research on the area (Attfield, 2000, Clarke, 2001, Dent, 1997, Gelber, 1997, 1999, Goldstein, 1998, Melchionne, 1999, Putnam and Newton, 1990, Watson and Shove, 2006) is a reference to home improvement activity. In other words the carrying out of tasks normally associated with the building trade, by amateurs in their own home, and in their own time. However, over the past thirty years the term DIY has taken on a much broader range of meanings.

At its two extremes, the term DIY can used to describe the most prosaic of home maintenance activity – applying a coat of emulsion to a wall, or putting up basic shelving or as a description of home-grown political protest – from underground publishing and alternative music, through to the organisation of anti-corporate protest movements. An example of 'radical DIY' is described on the Indymedia website, whose mission is 'to create and distribute a paper that reflects the lives we actually live ... the lifestyles, ethics, skills and ideas that enable us to live with increasing independence and self reliance from the dominant culture.'[1]

Aside from these more general definitions, the areas of DIY addressed by studies in Material Culture, Design History and Leisure Theory tend to be bounded by considerations of either home improvement, or the making of objects. Historically, the content of popular DIY magazines published in the UK during the 1950s and 1960s[2] is further evidence of the flexibility of the term. The subject matter of magazines such as *Practical Householder* moved from, in the 1950s, instructions on house maintenance and basic building jobs to, by the early 1960s, a catalogue of design ideas – technical drawings detailing the design and construction of household furnishings, such as lights and wardrobes (Jackson, 2006).

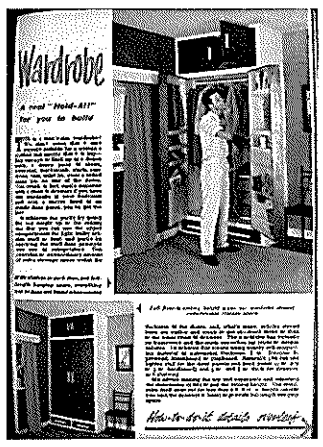


Figure 2. Plans for a self-build wardrobe featured in Practical Householder c.1963, U.K.

It is also possible to further distinguish between those activities that require the relatively simple assembly of pre-manufactured components (as in the Mirror Dinghy), and skilled activities that require high levels of creative input – the difference between assembling flat-pack furniture and constructing a unique object from unprocessed raw materials.

Atkinson (2006: 3) attempts to reach a finer gradation of do-it-yourself activity by employing a series of sub categories – Pro-active DIY; Reactive DIY; Essential DIY; and Lifestyle DIY. For Atkinson 'Pro-active DIY' contains significant elements of self-directed design input, the motivation being personal pleasure or financial gain, whilst 'Reactive DIY' consists of making

[1] http://portland.indymedia.org/en/2002/02/7832.shtml accessed 28/11/06

[2] Magazines consulted for this research included Practical Householder and Do-it-yourself, both published in the UK from the mid 1950s, with Practical Householder running until the early 1990s.

activities mediated through the use of kits or templates, the motivation ranging between a way of occupying spare time through to personal pleasure. 'Essential DIY' is defined as home maintenance activity carried because of economic necessity or a shortage of skilled labour (though such activities may also be personally rewarding), whilst 'Lifestyle DIY' consists of home improvement undertaken as emulation or conspicuous consumption, and where the use of one's own labour is by choice rather than necessity. The articles contained in the *Journal of Design History* special issue demonstrated this diversity by examining subjects as varied as DIY nuclear fallout shelters (Lichtman, 2006), inter-war women's magazines (Hackney, 2006), punk fanzines (Triggs, 2006) and amateur boatbuilding (Jackson, 2006).

Whilst this recent work takes a catholic view of the subject, earlier research tended to settle on those aspects that conform to Atkinson's definitions of 'essential' and 'lifestyle' DIY – in other words home maintenance and home improvement. The historical background to the emergence of these aspects of DIY, has been relatively well documented over the past decade by studies originating in both USA and the UK (Atkinson, 2006, Dent, 1997, Gelber, 1997, Goldstein, 1998, Jackson, 2006). A common feature of each of these studies is the idea that DIY activity is motivated primarily by external, rational and economic factors, and all find that increasing home ownership, the post-war labour shortage, and growing efforts by manufacturers to make the raw materials of DIY suitable for amateurs, served to make DIY desirable and accessible. The experience of war for both men and women had led to an unprecedented level of self-help and resourcefulness. The pre-war practice of renting accommodation had given way to home ownership and, as householders could no longer call on landlords to carry out minor repairs, they often took on minor maintenance jobs for themselves. By the 1950s as an economic boom took hold in both Britain and the United States, there was a labour shortage, and it became difficult for householders to find tradesman to carry out some jobs. Besides, many householders began to move beyond simple maintenance to home improvements. Spurred on by magazines and television programmers, thousands of people set about modernizing their homes. Manufacturers and retailers responded by developing and marketing new building products aimed specifically at the amateur market – they were easy to use, and importantly, they were easy to buy. Products that had previously only been aimed at tradesmen began to be sold in smaller quantities, and in forms that were easy for an amateur to understand and use. Power tools were designed with the home workshop in mind, and products such as the electric drill were marketed as versatile do anything products that brought even the most complex tasks within reach of the home handyman.

Understanding the Everyday

The tendency to focus on home improvement activity leads to a consensus in these studies over the utilitarian aspects of do-it-yourself. Studies that explore the contemporary context for DIY, and attempt to investigate what Atkinson terms Pro-active DIY –work that contains significant elements of self-directed design input, with the central motivation being personal pleasure– are few and far between. Writing from within the discipline of American Cultural Studies, Kevin Melchionne (1999) attributes the neglect of do-it-yourself as a worthy object of study to a lack of interest in the ordinary. Melchionne ventures that, in comparison to youth culture and political activism, 'do-it-yourselfing, at least in the incarnation of home improvement, is the purview of the most politically uninteresting group out there' (1999: 254).

Essentially, Melchionne uses the study of DIY to highlight what he sees as the prejudice of conventional cultural studies against the everyday and the material, complaining that 'Cultural Studies is above all Media Studies' and as a consequence fails to engage with the domain of objects (1999: 254). With the emphasis of conventional Cultural Studies on the spectacular and the representational qualities of texts, Melchionne argues that the discipline is in danger of neglecting the material culture of everyday life 'even as it flourishes beneath our noses' (Melchionne, 1999: 255). His central theme is that:

> Do-it-yourselfers make things. They do not just interpret them. Creativity resides not just in the construction of the meaning of the commodity, but, more importantly, in the physical formation of the final product (Melchionne, 1999: 249).

However, Melchionne's conclusions all but negate any possibility of the consumer carrying out DIY for personal

satisfaction. His argument tends to privilege the rational economic benefits of home improvement, suggesting that 'do-it-your-selfing is something that, under other conditions, one might have someone else do' (Melchionne, 1999: 250).

Viewed from the perspective of the United Kingdom, and the growing wave of interest in material culture studies and the ethnography of the everyday, Melchionne's concern about a lack of interest in the very day feels less compelling. The project to 'flatten' the study of design history – to encompass a more diffuse range of goods, treating the visual as subordinate to the social, and challenging aesthetics as the determining factor in the study of designed objects, is now well established in the UK. In addition, as Attfield points out, the rediscovery of 'things' by design theoreticians has confirmed the turn away from the immateriality encouraged by theories of representation that reduce all meaning to language. (Attfield, 2000: 7). Although the Cultural Studies project opened up the study of the everyday as a legitimate academic activity, it has since been criticised for its lack of detailed ethnography – the paucity of empirical data leading to accounts that are characterised as 'thin', with insufficiently contextualised interpretations (Murdock, 1997: 60). Musicologists worry about a failure to address the music itself –its structure, its content, and form (Tagg and Clarida, 2003, in Pitre, 2003)– whilst design historians are concerned about the failure to address the materiality of objects and the user experience. The desire for 'thick' description has led many researchers toward the ethnography formerly grounded primarily within the discipline of anthropology. This approach is able provide more finely grained research which takes account of particular local dynamics. Case studies are central to this approach, and are, as Graham Murdock has put it, used 'as a basis for puzzling out the complexities and nuances of current cultural collisions and encounters, and as an antidote to facile generalisations and comparisons' (Murdock, 1997: 66).

Design historians have benefited from work carried out in the field of Material Culture Studies, and work from this area that considers how people express or objectify their self-identities through the materiality of domestic space, (most notably Clarke (2001), Miller (1990, 2001) and Pink (2004)), forms a useful backdrop to this research. In each of these studies a rich account of everyday activity is derived from detailed ethnographic fieldwork and – in the case of Pink, who is trained as a traditional anthropologist – video evidence. Pink's work on gender, domestic objects and everyday life was partially funded by Unilever Research, and occupies an interesting middle ground between applied research and an academic study.

In spite of this turn towards a qualitative understanding of the everyday, it appears that apart from a few minor exceptions, published studies in the area of DIY and home-based making activities have tended to neglect the *experience* of the making process. The ESRC/AHRC funded research project led by Matthew Watson and Elizabeth Shove (2006) goes some way to answering this question, but their focus on the relation between product and practice, tends to limit the scope of their research with regard to this project. Their emphasis is on the acquisition and ownership of tools, and the associated concepts of need and utility, the development of competence and skill, and the dialogue between person and property. Although extensive, the span of their study does not address what it *feels* like to make things, and why this experience is so compelling that many will spend large amounts of their free time carrying out activities that others would regard as alienating work.

Work and Alienation

In order to answer these questions it is helpful to consider the relation between work and leisure, and to identify the motivations for making at home – drawing in concepts of self-actualisation, intrinsic reward and optimal experience. The further that amateur making activities move from house maintenance and home improvement to the making of objects, the less that utilitarian economic and rational factors help us to understand motivation. If we use Maslow's hierarchy of needs to position do-it-yourself, then in this example house maintenance might be considered to be positioned fairly near the bottom of the pyramid, whilst the self-directed making of objects is closer to Maslow's idea of self-actualisation, which is positioned at the top – it is the motivation that comes into play when all other needs have been met. Even though Maslow's hierarchy is not without its critics, the concept of self-actualisation provides a useful model for understanding certain forms of human behaviour. For Maslow, the characteristics of self-actualisers include spontaneity in ideas and actions, creativity, and in an interest in solving problems – and solving

problems is often a key focus in their lives (Maslow, 1970). These traits are familiar to anyone who has examined the behaviour of amateur makers in any detail.

In order to understand these motivations further, it is also worth considering the relation beween constrained and free work. In *The Art of Work* (1988) Roger Coleman describes the constraints inherent in extrinsically rewarded work. *The Art of Work* is a semi-autobiographical book, and many of Coleman's ideas are drawn directly from his experience of working as a craftsman.[3]

Coleman gives a powerful and familiar description of the limitations imposed by extrinsic reward, in this case whilst he was working as bench joiner (1988: 143). The joiner is constrained by his employer, the building firm. He has no choice about what he makes, how he makes it, or the length of time he is allowed to spend making an item. Consequently, he also has no control over the standard he is able to work to. Poor pay and a bonus system ensure he has little choice and little power over his working life. For Coleman, the alternative to employment as a joiner was work as an independent self-employed craftsman, which grants more freedom and control to the worker. He can set his own standard and determine his own hours. If he designs the work himself he can also choose his materials and invest the work the qualities he thinks it ought to have. However his customers are only willing to pay a certain amount for his work – and this is often less than the work is worth – so he ends up exploiting himself, much of the time:

> ...working long hours for little financial reward, worrying about money and the quality of my work, and trying to balance the pressure of bills against my own desire to work creatively (Coleman, 1988: 144).

Owing a heavy debt to the writings of William Morris, Coleman's book is shot through with a romantic view of pre-industrial society, and presents a highly moral and rather limited view of the meanings and consequences of mass production. However, some of the concepts he draws from his accounts of pre-industrial societies do offer valuable insights for our modern understanding of free time. Describing the attitude of the 'great Renaissance artists' he writes: '...work for them was not the alienating self-denying anti-autonomous activity that we see' (1988: 141). He justifies this assertion by discussing the idea of surplus value, arguing that in pre-industrial societies, surplus value was expressed as free time (1988: 141-150). In these societies, ritual activities abound – activities that may, in another context well be regarded as work. This 'work' acted as a way of making free time more significant – a ritualised, social and cohesive activity that was part of natural and instinctive creativity. In contrast to this, as industrialisation took hold, and as the division of labour became the key to increasing productivity and the efficient use of labour, the surplus value produced by the crafts was no longer available as free time which could be reinvested into social 'well-being' but was instead stripped away as profit. In other words, rather than being invested in the work itself, this surplus value was instead invested in machines to replace skill, and the trades and crafts were rapidly and inevitably dehumanised.

For Coleman there are two alternative motivating forces for work. He describes them as:

> Profit: Something extracted from labour and raw materials via a reductive process in which everything is expressed as money. Or art: a constructive process in which labour and raw materials are converted into complex cultural goods which have the ability to provide for a broad spectrum of physical and spiritual and emotional needs (Coleman, 1988: 148).

As an alternative to this rather pessimistic view, Coleman proposes a world that depends not on 'finalised, finite designs, but on open procedures in which people can participate in designing and making their own surroundings' (Coleman, 1988: 149). In effect Coleman was making an early case for customised consumption – the principle that the involvement of the consumer in self-directed completion of the production process (which is itself incorporated into the

[3] In his long and varied career since graduating from art school in the 1960s, Coleman has worked as a performing artist, joiner, political activist, designer-maker and self-sufficiency expert. At the time of writing Coleman is now the Professor of Inclusive Design and Co-director of the Helen Hamlyn Research Centre at the Royal College of Art.



act of consumption), can overcome the alienation inherent in mass production and its corollary, mass consumption.

Intrinsic Rewards and Optimal Experience

There is a parallel between Coleman's embryonic ideas put forward in the late eighties, and a much more recent study by Colin Campbell. The idea of 'interpretive consumption' –the theory that the meaning of mass-produced objects is somehow 'completed' by the act of consumption– has been commonplace in cultural and media studies since the 1960s. However, in an attempt to identify what he sees as a new model of consumer, Campbell has defined 'Craft Consumers' (Campbell, 2005). He argues for a category that could be described as consumer as 'self-actualiser'. This is in addition to Don Slater's consumer as 'hero' and consumer as 'dupe' (Slater, 1997), and Mike Featherstone's 'postmodern strategist' (Featherstone, 1991). For Campbell there is a category of consumer that 'consume[s] principally out of a desire to engage in creative acts of self-expression ...there is no assumption that they are trying to create, or even necessarily to maintain a sense of identity' (2005: 24). As Campbell points out, this is not to deny that consumption may relate to issues of identity. 'It is merely to reject the prevalent postmodern assumption that consuming is motivated by a desire to create identity'(2005: 40). Craft consumption involves the production of an object that is both designed and made by the same person, and involves the application of skill and judgement – it can be understood as a way of maintaining a sense of individual agency in the face of alienating mass production. Although this is a similar to the definition of craft used to describe pre-industrial production, the crucial difference is that the components used in craft consumption are themselves industrially produced. Campbell's craft consumption is also defined as having an autotelic or aesthetic dimension, which gives it a fundamental resemblance to play – or, to use the terminology of American psychologist and academic Mihaly Csikszentmihalyi, 'flow' (Csikszentmihalyi, [1975] 2000).

Flow is described by Csikszentmihalyi as a form of pleasure resulting from a merging of action and experience; a loss of ego that results from the participant being unable to reflect on their activity or consider the results – but nevertheless remaining in control of his or her actions and environment. The ideal conditions for the state of flow occur when the participant is challenged but not overwhelmed by the activity. Activities that are too demanding cause anxiety, and are unpleasant, whilst those that fail to stretch the participant are quickly perceived as boring, and are dropped in favour of more interesting activity. Flow takes place somewhere between anxiety and boredom. It is the essence of experienced creativity; deep concentration, problems forgotten, lack of self-consciousness, time forgotten and an experience worth having simply for it own sake and with no other reward.

Characteristics associated with optimal experience include being able to:

1. Merge action and awareness
2. Centre attention on a limited stimulus field
3. Lose oneself in one's activities – a loss of ego
4. Control actions and environment
5. Receive coherent demands for action and receive clear feedback
6. See the activity as self-rewarding, or autotelic

(Csikszentmihalyi, [1975] 2000)

Csikszentmihalyi uses the example of sailing in a fresh breeze to illustrate the idea of flow:

> It is what the sailor holding a tight course feels when the wind whips through her hair, when the boat lunges through the waves like a colt – sails, hull, wind, and sea humming a harmony that vibrates in the sailor's veins.(Csikszentmihalyi, [1992] 2002: 3).

In *Optimal Experience*, Csikszentmihalyi observes how artists become completely engrossed in the process of making a painting, the work filling their thoughts twenty-four hours a day. 'Yet as soon as the paint was dry, [the artist] usually stacked the canvas in a distant corner of the studio against a wall and promptly forgot about it' (Csikszentmihalyi and Csikszentmihalyi, [1988] 1992: 3).

Most artists recognise that their work is not going to make them famous or rich – so what, he asks, is the motivation for their continued practice as painters? Since the mid sixties Csikszentmihalyi's has devoted his career to understanding

the intrinsic rewards that are associated the making of art, the playing of sports, working in fulfilling occupations and, in fact, in most aspects of life. Csikszentmihalyi's project is to understand the intrinsic rewards associated with a multitude of everyday experiences. His aim, over the thirty years that he has developed his ideas, has been to apply the concept to as many fields as possible. Indeed, his ideas have proved to be so pervasive that they have been taken up by and applied by academics in fields as varied as education, business studies, sports psychology and sub-cultural theory.

Serious Leisure

It is reported by Csikszentmihalyi that the flow experience occurs more than three times as often in work as in leisure (Gelber, 1999: 9). One might also question the relevance of flow to leisure because most leisure activities in our culture are non-challenging – and flow depends on an optimal relationship between challenge and skill. In order to resolve this contradiction, it is worth considering the relation between work and leisure.

One of the central debates in leisure theory is the discussion about the place of leisure in relation to work – is leisure a relief from work, a compensation for the qualities deemed to be missing from the experience of work, or is the job experience so powerful that it spills over into free time, causing leisure activities to become a mirror of work? The historian Steven Gelber, who has carried out extensive research into hobbies and pastimes in early 1950s America, pins his study around the concept of 'productive leisure' (1999: 2) and the impossibility of separating work from free time – he is interested in the inevitable seepage between the two. He coins the phrase 'disguised affirmation' to describe the ways that work values are replicated in the home, whilst simultaneously compensating for its deficits: 'The productive leisure of hobbies has operated as a form of disguised affirmation, helping to sustain the overarching ideology of capitalism by serving up its ideals in the palatable form of domestic leisure' (1999: 11). In order to avoid a simplistic opposition between labour and leisure, he argues that if his thesis is correct 'people should embrace leisure that reflects values that originate in their work and avoid activities that contradict those beliefs' (1999: 15).

The publication of *Make* magazine (Parks, 2006), again from the United States, reveals that many amateur makers earn their living from a field related to their hobby, but use their leisure time to express ideas, and work in a way that the strictures and structures of their work disallows.



Figure 3. Make magazine – Volume 01, February 2005, (O'Reilly Media, Inc. U.S.A.).

The makers featured in this quarterly magazine engage in forms extreme hobbyism, examples of which range from the designing and building of a working roller-coaster in a domestic yard, to the making of an alarm clock that wakes the user by frying rashers of bacon. One of the most obsessive of these projects is the 'Handmade "G5 Cube" computer' - a perfect, but morphed reproduction of a Macintosh G5 computer casing that is capable of housing the user's old G4 cube. The *Make* motto 'If you can't open it, you don't own it', neatly expresses the desire amongst some consumers to regain control of the individual agency that is sacrificed when products arrive hermetically sealed, and impervious to any creative modification or repair by the end-user.

Sometimes described as being driven by a 'protestant leisure ethic' (Clarke and Critcher, 1985, in: Gelber, 1999: 11), extreme pastimes such as these have been described as 'productive', or 'serious' leisure. Serious leisure is substantial enough for the participant to engage in the long-term acquisition of a

range of special skills, knowledge and experience. The activity integrates participants into a sub-culture, and provides them with benchmarks by which they can measure their achievements (Pantzar and Shove, 2005: 2-3). People seeking flow in their pastimes will tend to make them more work-like, hence more challenging – always safe in the knowledge that they can quit if the challenge becomes overwhelming. Some leisure activities are work-like in that they are complex and demanding, and even, at times unpleasant. However, the fact remains that they continue to be intrinsically rewarded, and a component of this reward is optimal experience. The examples of craft or engineering found in *Make* magazine are, at times, more challenging and demanding, and contain a higher level of skill, than the professional equivalent. These activities are taken to an extreme, but remain within the boundaries of leisure, because they are self-directed and contain an element of freedom of choice. They are also rarely motivated solely by extrinsic rewards. An earlier example of these extremes can be found in the hot-rodding activities of West Coast American men in the 1960s who built vehicles in their free time, and in their home garages (Moorhouse, 1991). Their activities were so intense that during the 1960s a number of amateur car builders managed to hold the world land speed record (Diamond, 1996). Hot-rodder's frequently explained their involvement in hot-rodding in terms akin to a love affair, with words like 'fever' and 'addiction' often being used (Moorhouse, 1991: 188).

So, the intrinsic rewards associated with optimal experience are a powerful motivational goal, both in the craft activity of making objects, and in the case of sports equipment or vehicles, the ensuing experience of using the finished objects. Joe[4], who is the subject of the first of a number of case studies that will be carried out as part of this project, compares the experience of individually fitting the strips of timber on his hand made canoes, with the pleasure felt when he is on his own in his kayak, simply paddling out to sea.



Figure 4. Joe's homemade kayak (Whitstable, U.K. 2006).



Figure 5. Making the kayak.

Joe was originally in the Royal Navy, but has since learnt his making skills in the course of renovating his flat. It was the profits from the sale of this property that allowed him to invest in a small workshop, and begin making his canoes. Although he would like to sell his canoes, he acknowledges that the amount of work that he puts into them means that he would never recoup his costs, and regards the work as a hobby. Whenever he has a break in his paid work –which is unrelated to his canoe building– he comes to his small workshop and, as he puts it, 'enters into another world'. Joe's previous job working as a CAD operator for an engineering company 'had [him] going stir crazy', and although he now has a paid occupation that is more suited to his practical nature, he still regards the time spent in his own workshop as a form of therapy. The overall project of planning a new kayak requires some research and planning but, once the jig is built, a series of familiar processes ensue. These are demanding, but because Joe has developed skills the necessary to carry them out effectively, they do not cause anxiety. The fact that he is

[4] The names of informants for this study have been changed to protect their anonymity. Interviews carried out in the respondent's own workshop during January 2007.

working in the controlled and secure environment of his own workspace allows him to control his actions and environment and centre his attention on a limited stimulus field. His tasks provide coherent demands for action and offer immediate feedback. For Joe, making his kayaks allows him to lose his sense of self in his activity, and his sense of time becomes altered. Although the reward is partly constituted by the ownership of a beautiful new kayak, several of his canoes remain unsold, or have been given to fellow canoeing enthusiast for a fraction of their true worth. The reward for Joe is intrinsic to the process of making, and his account of the experience of making things has all the qualities of the Csikszentmihalyi flow model.

Conclusion

This research begins to uncover incentives for serious leisure pursuits that go beyond the rational and utilitarian, and provides alternatives to postmodern models of strategic identity creation and maintenance. By interrogating the moment-by-moment experience of making things outside of a professional context, it aims to show how consumers are able regain a sense of personal agency and self-fulfilment through their making activities.

Studies in consumption have consistently drawn upon the Hegelian notion of alienation in order the describe the state of unhappy consciousness that results from a world in which the production of objective culture has far exceeded our ability to incorporate it subjectively into our personal and social development (Slater, 1997). Put simply, in order to assimilate the objective world into our subjective consciousness we have to recognise that the world as made by us. If we fail to see this then we comprehend our material surroundings literally as being alien to us. Our agency, our capacity to act in an autonomous and creative capacity is reduced to our capacity simply to choose from a pre-determined range of objects. The desire to craft, to engage in creative acts of production, whether that be along the lines of Campbell's idea of making new things from pre-manufactured components, or the production of sophisticated artefacts from unprocessed raw materials, is borne of a desire to escape from the alienation of constrained work described so vividly by Coleman, and to regain the sense of personal agency that is denied by the so-called free choices of capitalism. By exploring the processes inherent in the self-actualising activity of making things, the addition of Csikszentmihalyi's model of optimal experience to these theories offers us a deeper understanding of amateur and the everyday.

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DESIGNERS DANCING WITH(IN) THE ORGANIZATIONAL HIERARCHY - THE IMPORTANCE OF NON-HIERARCHICAL POWER TO DESIGN

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Abstract

This paper confronts Mary Parker Follett's theoretical power discourse, developed at the beginning of the last century, with contemporary views of industrial designers. It presents Follett's non-hierarchical view of power and relations within organizations and discusses a Follettian perspective on relationships between designers and other members of the organization, proposing that one of the reasons for current views of design within the organizational reality may be difficulties of doing creative work within a hierarchical organization. We conclude by outlining an empirical investigation involving interviews with respected industrial designers in Sweden and the U.S to explore common perspectives and views on non-hierarchical power relationships in organizations and the extent to which they may facilitate the designers' work and the organization's possibilities to take advantage of the designers' methods and results.

I do not think that power can be delegated because
I believe that genuine power is capacity[1]

It is possible to develop the conception of power-with,
a jointly developed power, a co-active, not a coercive power.[2]

[1] Parker Follett 1995:111
[2] Ibid p.103

Many design management researchers have observed that top management's attitudes and relations towards design are extremely important (Borja de Mozota 2003, Bruce and Cooper 1997, Svengren 1995). Others have highlighted problems of communication between designers and other professional groups within the design management discourse (Johansson and Svengren 2006). Relations between the designers' discourse and the discourse of other professional groups that interface with designers are a source of possibilities and problems: Possibilities in the sense that designers often influence colleagues in a positive way, but problems because there is often resistance or other obstacles that result in design(ers) influencing the situation less than they otherwise might wish to do (Johansson 2006, Johansson and Svengren 2006).

How might the organizational setting adapt in order to be able to cooperate with and take advantage of the resources potentially provided by design? This question arises from the knowledge that design is often an underused resource as well as a great potential for industrial growth. Many dimensions of organizational change and adaptation might be beneficial. Here, we focus on power relations, and discuss the possibilities of non hierarchical power and what that concept might mean to the relations between designers and other organizational professionals.

We start by acknowledging Mary Parker Follett (1868-1933), sometimes called "the prophet of management" (Graham 1995), or "the mother of them all" (Linden 1995), who wrote at the beginning of last century, contemporary with Frederick Winslow Taylor (1856-1915), often called "the father of scientific management" (Copley 1923). Follett formed a counter-stream to the developing mainstream management theory and practice. She was very practical, yet also the originator of many theoretical concepts. We suggest that Follett's ideas –that are related to current management ideas such as empowerment (Eylon 1998), chaos theory (Mendenhall, Macomber et al. 2000), organizational learning (Carter 1992), organizational justice (Barclay 2005), and stakeholder theory (Schilling 2000)– constitute a discourse relevant to designer and design management. Specifically, we propose that her organizational view is of an organization that is more welcoming to creative work –and therefore for designers– than main stream organizational settings. We not only suggest that Follett is relevant to designers, we also make the assertion that the form of non-hierarchical power she proposed may be a necessity for designers' work.

Mary Parker Follett developed a concept of power that was non-hierarchical in the sense that it was not "power over another person" but rather "joint power over the situation" (Metcalf and Urwick 1941) pp.95-116). Follett believed strongly in social democracy, and described power as an energy that emanated from the circular response between people and ideas. Using a Hegelian dialectic technique, her concept blended extremes into a unique synthesis (Ryan and Rutherford 2000), that created a dialogue that changed those participating in it. This "circular response," as she labelled it, was the basis of her view of power, control and responsibility (Follett 1924/1995).

Designers often claim they have no power, or that they do not fit into the corporate culture and that their ideas are not heeded.[3] It may be that they feel this way because their method of working requires something other than a traditional hierarchical environment. An alternative arrangement might include non-hierarchical power relations of the kind that Follett proposed. We aim to elaborate and reflect on this theme using an exploratory study that includes interviews with distinguished designers in the US and Sweden.

In this paper, we begin by reviewing the discourse of Follett and her followers on non-hierarchical power. Next, we problemetize the relationship between Follett and the design discourse. In the third section, we establish the grounds for our ongoing empirical investigation with industrial designers in Sweden and The US. We conclude with reflections on contributions of our work.

THE DEPTH AND BREADTH OF FOLLETT'S WORK

Mary Parker Follett was born in 1868 into comfortable circumstances, and lived and died in the Boston area. By the time she died 1933 she had written a number of books: *The Speaker of the House of Representatives* (Follett 1896), *The New State: Group Organization the solution of popular government* (Follett 1918/1920), *Creative Experience* (Follett 1924/1951). In the last years before her death, she gave a serious of lectures that were compiled posthumously and published as *Dynamic Administration* edited by Fox and Urwick (Metcalf and Urwick 1941; Fox and Urwick 1973) and *Freedom and Coordination: Lectures in business organizations* (Follett 1949). As seen from the titles, she started in the fields of politics and public administration, then moved later to industrial management, or as we would say today "from political science to business management." The shift came from her experiences with the Boston Placement Bureau and Minimum Wage Board and provided her with the intellectual stimulus to develop her concept of integrating opposing points of view for overall control of the whole situation (Parker 1984).

Follett had a broad understanding of different intellectual streams, and like many intellectuals of her time, read across the disciplines and was well read in a spectrum of different subjects. In addition to the areas above, she was influenced by ideas from biology, law, history, economy, social work and religion (O'Connor 2000). Most often she used arguments based in psychology or philosophy. In psychology, she was specifically

[3] This is an observation made by one of the authors (Johansson) during her interviews, group discussions and informal conversations with about 40 Swedish designers as part of her evaluation of the Swedish governments design program. It might not be valid for American designers.



interested in German Gestalt therapy that had a holistic view of the human being, thereby being in opposition to the positivist and behavioural perspectives that came to dominate most of twentieth century psychology. Follett's view of the human being as a holistic entity was the ground for all her thinking on human relations and her concept of circular response.

In philosophy, Whitehead and Hegel had the strongest influence on Follett. Whitehead's process philosophy, stressing "becoming" over "being," underlay the Gestalt therapy mentioned above. Follett's teachers at Radcliff were Hegelians, and from then she took the dialectic view that she later used as a base for her discussion of conflicts (Ryan and Rutherford 2000). Conflicts, according to Follett, are a source of dynamic development where new *integrations* (or *synthesis* in Hegelian terms) are made.

Though she was academically respected (and a research institute was founded in her name in Japan in the 1920s), Follett never undertook a doctoral dissertation nor held an academic position as a professor. Instead, as was common with women of her social standing, she engaged in voluntary social work in a neighbourhood close to her home. Among other things, she was an advocate for vocational training (Morton and Lindquist 1997, Tonn 2003), and her home acted as a salon for intellectuals in the Boston area. She was also a member of a number of boards of both non-profits and corporations, and this gave her extensive insights into business administration.

Follett never labelled herself a feminist (Morton and Lindquist 1997). She was not a part of the suffragette movement at that time, but, instead, was active in a number of causes concerning opportunities for girls and women. However, a gender neutral perspective does not create a fair representation of her. If Follett had been a man she would not have done the voluntary social welfare work that was an important ground for her holistic world-view. Most likely, she would have needed an academic position as professor for her reading and writing, rather than being able to do it because of her financial independence. And that in turn might have changed the way followers related to her and her work.

Mary Parker Follett had neither strong opponents nor devoted disciples[4], something that distinguished her from Frederick W. Taylor, who had plenty of both. This, Drucker (1995) says, may be one of the reasons why she and her theories were almost forgotten for several decades after her death. Another reason why the ideas became silent, according to Drucker, might be that there were no grounds for integrative and holistic views in the US – integration was far from a policy on the national agenda after World War II and during the Cold War era of the 50s and 60s. These reasons, as Kanter (1995) points out, are not unrelated to gender. The way of holistic thinking, including merging private and professional spheres, integrating ethic into the whole life, and bringing citizenship into the company, are, instead, ideas that later were labelled women's culture (Morton and Lindquist 1997). Both cultural feminism and radical feminism have taken as point of departure that women's culture has been underprivileged and silenced in favour of male culture (see, for example, Tong 1998). Thus both the political and social environment may have contributed to the fact that Follett's ideas were not included and debated as part of the development of management theory until the latter twentieth century.

Follett's ideas were not totally forgotten[5]. Her concepts and ways of thinking have had a revival prompted by the much heralded publication, in 1995, of *Mary Parker Follett—Prophet of Management*, a compilation of her writings with comments by leading contemporary management scholars, including John Child, Peter Drucker, and Rosabeth Moss Kanter. Over the last decade, deep analyses relating Follett to recent streams of thought and management practices have emerged, including:

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[4] This is a simplification. British management theorist Lyndall Urwick (1891–1983) is recognized for integrating the ideas of earlier theorists, including Follett, but did not take her ideas further; instead he published them as they were.

[5] Fry, 8. R. and L. L. Thomas (2006). "Mary Parker Follett: assessing the contribution and impact of her writings." Journal of Management History **2**(2): 11-19, made a thorough search and found that between 1969 and 1990 Follett was cited in 148 articles written by 129 authors in 96 different journals and periodicals. Follett was also briefly cited in most of the major pre 1978 public administration and management texts. Most of the text references, they claim, cite her in a rather shallow context, without appreciating the implications of her work.

• Chaos and complexity theory (Mendenhall, Macomber et al. 2000): Follett clearly articulated principles of non-linear dynamics, although in behavioural rather than mathematical terms.

• Empowerment (Eylon 1998): Follett's writing points to the fact that it is not the giving of authority that is important for empowerment to succeed but the development of methods for allowing empowerment components such as responsibility, responsiveness, reciprocality, and synthesis to be present.

• Lifelong learning (Salimath and Lemak 2004): Follett was an ardent advocate of education, particularly through adult education, and education of executives, as being the root from which the tree of democratic social organization can grow.

• Organizational justice (Barclay 2005): Follett's perspective places justice as a context-specific and dynamic process, and provides opportunities for further exploration, including emotionality of injustice, integrative unity, and circular responses.

• Stakeholder theory (Schilling 2000): Rather than focusing on the boundaries separating groups, and the differentiation between their objectives, Follett focuses on the connectedness between the organization and other stakeholder groups and on integrating their interests.

While many of these concepts are applicable to designers working in an organizational setting, our interest is specifically in organizational power and the insights that Follett can bring to the current workplace. In the next section, we present the foundational aspects of her view of power, using her own words, followed by our interpretation that is intended to bring Follett's ideas into the purview of industrial designers.

FOLLETT'S NOTION OF POWER

Follett's notion of power is interesting for many reasons. It was grounded in a democratic view of society, stressing freedom over repression. As a non-hierarchical view, it stands in contrast to most managerial views of organizations that presuppose a hierarchy. To Follett, power was more equivalent to capacity than to coercion. Power was something that enabled actions and provided freedom rather than repression. From her social liberal and democratic standpoint, it was important that "power of the individual" did not constrain other people's freedom. With this view she bridged and constantly moved between the individualist and collectivist perspectives (Ryan and Rutherford 2000).

"The circular response" perspective– a relativist and relational view upon human relations and organizational change

> The most fundamental about all this is that reaction is always reaction to a relating... I never react you-plus-me; or to be more accurate, it is I-plus-you reacting to you-plus-me... that is, in the very process of meeting, by the very process of meeting we both become something different. It begins even before we meet, in the anticipation of meeting... it is I plus the-interweaving-between-you-and-me meeting you plus the-interweaving-between-you-and-me, etc. If we were doing it mathematically we should work it out to the n^{th} power (Follett 1924/1951, pp. 62-63).

The relational view that people were not something separate in themselves, but rather something in relation to other people, was the ground for Follett's thinking about both people and organizations. She gave the example that you might be one character with one person, but not the same with another one. You are and become in relation to other people. This perspective was far as it could possibly be from the positivist view that dominated the social sciences during the twentieth century. It was a true relativistic way of thinking.

This relational view, which Follett combined with a holistic view, was also applied to organizational reality. She saw organizations as something constantly in change, and as (Mendenhall, Macomber et al. 2000) note, she recognized and described in a non-technical way, the principles of non-liner dynamics in social systems, earning her the title of "mother of chaos and complexity theory." She viewed all interactions as having a potential for every participant to affect every other participant in the organization, whether the person was aware of it or not – a view that was quite different from the prevalent one of direct one-to-one cause and effect.

"Power with" instead of "power over" another person

> We should learn to distinguish between different kinds of power... It seems to me that whereas power usually means power-over, the power of some person or group over some other person or group, it is possible to develop the conception of power-with, a jointly developed power, a co-active, not a coercive power... I do not think the management should have power over the workmen, or the workmen over the management. (Follett 1995:103).
>
> Power is self-developing capacity (Follett 1995:113).

How to reduce power-over... One way of reducing power-over is through integration.

Follett, with a fundamental democratic view, was in opposition both to the conservative and the Marxist movements, and therefore saw "power over" another person as something that was to be avoided. She even said that "one person should not give orders to another one" (Follett 1926) thereby constructing the world as a non-hierarchical one. Instead of having "power over" another person, you should have "power with" or shared power.

This strong emphasis on "power with" or shared power made Follett view delegation in a specific way. Delegation was often– and is still–seen as a commodifying activity (Johansson 1998) where the authority and power is moved from one person to another. Follett commented that so is not necessary the case. You can delegate power without loosing it, but rather sharing the power. The crucial thing, Johansson says, is that power does not have the character of a commodity of a given size that can be moved back and forth. Rather, power has characteristics similar to feelings or emotions (of hate or love, for example) that can be expanded, and therefore does not necessarily leave one person because it is given to another. Follett describes that characteristic of power as one of "capacity."

> I do not think that power can be delegated because I believe that genuine power is capacity. To confer power on the workers may be an empty gesture. The main problem of the workers is by no means how control they can wrest from capital or management, often as we here that stated; that would be a merely nominal authority and would slip quickly from their grasp. Their problem is how much power they can themselves grow (Follett 1995:111).

In hierarchical organizations, power is distributed to positions rather than to persons. This is the foundation of Weberian organizational theory. Follett had a very different idea of power. She started with power as a force and a capacity. Delegating power therefore became a complex process. Not only that it, as said above, power could be delegated yet still held by the person; she also recognized that delegation needed to be accompanied with capacity or ability.

The law of the situation – Power over the situation instead of power over other people

> I think the solution is...to depersonalize the matter, to unite those concerned in a study of the situation, to see what the situation demands, to discover the law of the situation and obey that. That is, it should not be a case of one person giving commands to another person. Whenever it is obvious that the order arises from the situation, the question of someone commanding and someone obeying does not come up. Both except what the situation demands (Follett 1995:128).

Follett frequently referred to "the law of the situation", "to see what the situation demands" or "discover the order integral to a particular situation." Her approach is the opposite of Frederick Taylor's (1911) universal principles that neglected the situation at hand and demanded that the workers should rely on principles, orders, and instructions. Follett, on the other hand, said that the situation at hand had precedence over principles. Furthermore, it has to be so to such an extent that what is required for the situation at hand should be the ultimate order, with priority over other orders.

Follett also referred to the "power over the situation" as collective power. Here, instead of trying to get or give power between people, or competing for power, we can turn our focus towards the situation "at hand" –that we all are in– and try to develop (joint) power over the situation. The concept of "power over the situation" therefore becomes an alternative to

the individual competition that is so obviously at hand in most organizations today.

"Dynamic conflicts" – Conflicts as the ground for creative development

> There is a way beginning now to be recognized at least, and even occasionally followed: when two desires are *integrated*, that means that a solution has been found in which both desires have found a place, that neither side has had to sacrifice anything (Follett 1995:69).
>
> Let us take some very simple illustration. In the Harvard Library one day, in one of the smaller rooms, someone wanted the window open, I wanted it shut. We opened the window in the next room, where no one was sitting. This was not a compromise because there was no curtailing of desire; we both got what we really wanted. For I did not want a closed room, I simply did not want the north wind to blow directly on me: Likewise the other occupant did not want that particular window open, he merely wanted more air in the room (Follett 1995:69).

Follett had a remarkable view of conflict. In contrast to Taylor, who really feared conflicts and tried to avoid and instrumentalize them, Follett saw conflicts as the root of organizational development and something that should be handled openly. How conflicts were treated and resolved was important to her. She divided conflict resolution into three types: First, domination, which was something negative and related to "power over" rather than her democratic "power with," and second, compromise, which was also something negative because it required curtailing the wish or need of one or all of those involved. The third strategy of conflict resolution, she labelled integration, and provided the rather simple example in the quote above.

Follett's distinction between compromise and integration is also worthy of note. Her distinction is closely related to Hegelian dialectics where opposites may be resolved in synthesis. To reach a synthesis – or integration in Follett's vocabulary – between conflicting persons or organizations, a circular behaviour or response is needed. By looking at the situation at hand and the evolving situation, new possibilities for creative solutions might appear. In this way, the concepts of power, integration, circular response and the law of the situation are closely related to each other.

Power as creativity – or capacity to create new alternatives

> I think we may learn that a jointly developing power means the possibility of creating new values, a wholly different process from the sterile one of balancing. Not to rearrange existing values, but to bring more into existence is the high mission of enlightened human intercourse (Follett 1995:116).
>
> To confer authority where capacity has not been developed is fatal to both government and business (Metcalf and Urwick 1941 p.112).

The world of Follett was an ever-changing world, and the situation or the reality at hand was more important than holding on to universal principles. But also this reality was a consequence of human interaction. So the very base for power, one could say, was creativity and constant circular response in a looking for a more democratic and human world.

Our interpretation of Follett's power notion is that the line between power and creativity is blurred, making it impossible to separate the one from the other. And they both rely upon circular response, which was the ground for most of Follett's thinking. Also creativity for Follett was a mental capacity to create something new, whether it was a new idea or something else. Power and creativity were also related closely to her concept of integration. Power then can be seen as what is needed for creativity, a companion for creative thinking, and an outcome from creative thinking, making it possible to find integrative solutions.

Power as energy – including an emotional dimension

> Power might be defined as simply the ability to make things happen, to be a cause or agent, to initiate change. Perhaps the "urge to power" is merely the satisfaction of being alive...
>
> It has always seen to me that the violinist must get one of the greatest satisfactions of being alive; all of him is



> enlisted, he surely feels power. Probably the leader of an orchestra feels more (Follett 1995:101).

Power within an organization or between individuals is normally seen as something very different from electrical power. However, embracing Follett's texts on power, we have come to see power as something that has similar characteristics or qualities to electrical power: characteristics of flow, providing energy, and also sustaining activity. Power as energy also contains an emotional dimension because being full of power or feeling powerless are emotional states. This is a dimension too seldom recognized within the social science power concept.

Summary of Follett's non-hierarchical power concept

Follett's power concept begins with, and always returns to, the circular response. It is about responding both to the situation at hand and to other people. "Power with" is more important than "power over." Power is related to conflicts and conflicts should be handled with creativity in order to try to find an integrative solution rather than a compromise or domination. Therefore, her non-hierarchical power concept is a tool for creative and organizational development. This is a very different power concept from the one that is taken-for-granted in most corporations and described in management theories.

WHAT DOES FOLLETT'S NON-HIERARCHICAL POWER HAVE TO DO WITH DESIGN?

At a first glance, Follett has nothing to do with design. We do not know of any specific interest in design from her side. Nor does she write about design. So how come that we relate Follett to design? There are a number of perspectives that can be taken in order to relate non-hierarchical power to design. Before doing that, however, we would like to make explicit our view upon industrial design, so that the reader can see the meaning endowed/put into both concepts that we are trying to relate to each other.

What is design?

What is meant by "design"? The word is given quite different meaning in different context. For example, in Scandinavian popular culture, like TV, and magazines, design very much refers to exclusivity in form and colour, giving the artefact an art-like experience. This resembles what the sociologist design researcher Julier (2004) refers to as *high design*, a concept related to Bourdieu's philosophy and therefore related not so much to exclusivity per see as a contextual exclusivity – what is perceived as exclusive by a given group at a given time. This, therefore, also resembles the definition of design given by the Smithsonian's Cooper-Hewitt National Design Museum in US. This states simply, "Whether it's handmade or mass produced high end or low brow, good design is in the eye of the beholder" (www.cooperhewitt.org). Both definitions focus on the artefact and the relation to the result as well as the relation to the art discourse.

Another, quite different, definition is given by the Nobel laureate, economist and psychologist Herbert Simon (1964); his definition covers the design process of engineers, architects, and industrial designers. Design, for him, is the creation of the artificial separating it only from what has been created by nature and coincidence. Simon puts much focus on the design process and characterises it as epistemologically separated both from humanistic knowledge (concerned with insights), social sciences (concerned with analytical and critical knowledge) and the sciences (concerned with explanations of what is already existent).

Simon's notion of design is related to the etymological definition. If you search for *design* in the Oxford English Dictionary (19B9) you will find that the *verb design* comes from the latin *designare*, meaning "to mark or to point out something," implying that it is something that differs from the surrounding. The verb design can in English be traced back to 14th century and is related to "denote, signify, or show by a mark or token, to design, prescribe, appoint" i.e. to mark, but also to prescribe something or to tell how something should be or be produced. The lexicon also talks about design as "making a plan or a mental scheme for something to be realized, a preliminary idea, a project", and to "signify, stand for" i.e. being different and stand out from the context – something that still is the case if you regard design from a marketing perspective. In the latter meaning, the word design has been used in the English language since the renaissance and this is, according to Julier (2000), still

the base when discussing strategy and differentiation within industrial design.

The substantive "design", means, according to the same lexicon "a mental plan". Since the end of the 17th century it has been used for "a preliminary sketch for work of art, building, or other decorative work" (Oxford English Dictionary 1989). Here it is the preliminary result of the work process – the preliminary sketch of the art piece, the building, etc. that is in focus. Interestingly to note is that the verb was used about 300 years before the substantive came to use – at least if you trace the records available.

Among the industrial designers as a profession there is a strong focus on both aspects; on the substantive and the product as well as the verb and the process. Many design researchers stress this double dimension as important (Simon, Ramirez, Svengren, Johansson 2006b). The design process and work method have also been regarded so important that is used even outside product development, for organizational development and for creation of service rather than products (Johansson 2006a, b).

The design process might be the reason why Johansson and Svengren (2007) tell us that designers often talk about themselves as invisible in a way that resembles of feminist theories about invisibility (Gilligan 1982, 1992) in the modern western society. How come that designers, whose products obviously are exposed and visible relate themselves to invisibility. The irony of the situation can be phrased as designers being at the core of visibility, being experts on making concepts visible do have problem with visibility. Johansson and Svengren discuss it in the following way:

> No one can reasonably state that design in itself is invisible. On the contrary, it is the design and the exterior form that first appear when we approach a product, for example a mobile phone, rather than the interior technical qualities. Though design in many ways is so visible that it shouts towards us in the public space, we would argue that the designprocess and its importance is not enough recognized by management. To a certain degree there is reason to believe that it is due to the discourse of the design area itself.

Many design researchers claim that design cannot be described, defined, or understood the same way as knowledge from the social sciences, the humanities, or the natural sciences. Similarly, both Simon (1969/81) and Ramirez (1998), for example, claim that design competence and design knowledge are difficult to place within these epistemologies or within the most common perceptions of knowledge and what constitutes knowledge. One reason for this might be the close connection of design to visibility, and that the message from pictures and other visible expressions are less discursive than verbal expressions. So the visibility makes the designer visible and invisible simultaneously.

Describing something verbally is a way to give it a discursive form and make it visible, thereby creating something meaningful. But it is at the same time a matter of separating this meaning from other meanings and creating limitations. In our own definition of industrial design, we follow the Norwegian industrial designer Monö (1997) who characterises design as a combination of the following three dimensions: (1) engineering/production, (2) art/aesthetic and (3) functional/human aspects. Another Norwegian, Jan Michl, (1995) defines industrial design in the following way:

> The development and planing of industrially produced products with the aim of making them attractive for the user. The process preceeds the production and begins with and includes improvements and shaping of the products functional sides, user qualities and appearance, and adjusting the product for mass production, distribution and selling. Aestetic shape of the product is seldom the only contribution but is always counted as important (Gyldendals Norwegian dictionary, translation by Johansson).

Design is here about industrially produced products that should be made "attractive for the user". This can be done through making the product more functional, more user-friendly or through its aesthetic. However, there should always be an adaptation to enable mass production.

In Johansson (2006b), design is described as a process, as a method of working that is less analytical and more iterative and holistic in comparison with social science and technical

work. People who cooperate with designers often talk about designers' approach to problem-solving in terms of "design as a way of thinking" – something that relates more to the epistemological difference between design and social sciences than to any specific model of working.

DIFFERENT PERSPECTIVES ON THE RELATIONSHIP BETWEEN INDUSTRIAL DESIGNERS AND NON-HIERARCHICAL POWER

Our interest in connecting *Follett* with *design* is based in a personal epiphany that happened when Elisbeth Svengren, an established design researcher, was reading Ulla Johansson's (one of the authors) dissertation. This dissertation was an ethnographic account of building caretakers' (janitors') work and what happened in some real estate companies when the caretakers were assigned so-called "holistic responsibility" for an area of their own. Johansson (1998) argues that it is impossible to understand what was happening without using Follett's notion on power. When the caretakers took on the holistic responsibility, there was not a shift in responsibility in the hierarchical way or any organizational transformation in the Tayloristic way. However, by using Follett's notion of power and responsibility, what was happening became visible, and could be described in Folletian terms.

Svengren, in her discussions with Johansson, exclaimed, "This text is about the designers and their situation!" and claimed that the text about Follett and the caretakers was relevant to design management. What, then, for us, makes Follett ascribable in general to the work of designers? Here we highlight and discuss two perspectives on the relation between Follett's non-hierarchical power and the situation of industrial designers, first focusing on the creative process, and then on the holistic perspective. Our method is a deductive and analytical comparison, or what Glaser and Strauss (1997) label as "armchair research." In addition, we extend our armchair theorizing by developing a research agenda for an empirical study that will provide a contemporary viewpoint of power relations within the design management process. The results of this research will enable our theoretically elaborated perspectives to be further developed – or discarded if our assertions are not supported.

Creativity and chaos are oxymoronic to hierarchy

First of all, Follett was one of the first people within management theory who had a specific interest in creativity and organizations. She described how creative activities could not be grasped:

> To view from the outside, to dissect it into its different elements, to lay these elements on the dissecting table as so many different individuals, is to kill the life and feed the fancy with dead images, empty, sterile concepts (Follett 1918:63).

This quotation, in our interpretation, demonstrates Follett's understanding and interest in the creative process; here she catches the integrative way of doing creative work. Though, to our knowledge, she did not talk either to or about designers, her way of thinking and writing about organizations built on a creative perspective of human activities. This was very different, not to say alien, to scientific management and to the hierarchical world of Taylor that became the platform for development of organizations during the 20th century.

How do creativity and chaos relate to each other and to hierarchies? Saussure (Saussure 1960) explains that a way to understand a concept is to relate it to its opposite. A concept does not mean much by itself, instead it creates a meaning in relation to its opposite. White can only be understood either in relation to black or in relation to a number of concepts for white that differ from each other – similar to the way in which Eskimos have many different concepts for "snow".

The opposite of hierarchy is not only non-hierarchical but also chaos: a concept that implies the total loss of hierarchy. Chaos and industrial design relate to each other in an interesting way because design is a way of both handling chaos and structuring it. The design process is an iterative process that involves both chaos and structure such that a designer's relation to structure and chaos resembles the character of *romantic irony*, a conception that

> expresses the boundless creative potentiality of transcending seemingly frozen polarities. This is realized by ironically soaring, in a kind of weightless, non-

> synthetic dialectic, in the abyss of uncertainty between apparently irreconcilable opposites. Using romantic irony constitutes a new approach to understanding and coping with contrarieties in management and organizing (Sköldberg 2005:127).

An ironic perspective is a paradoxical one, because it requires handling multiple realities at the same time without giving privilege to one of them (see Johansson and Woodilla 2005). Two designers of information systems described this paradox as follows:

> To formulate a design method is always a delicate task. The purpose is typically to establish some certainty and control in the design process. But this striving for predictability and control is a paradox in design, since in reality the most valued and desirable characteristic of a design process is creativity and thus the ability to find the new and the unexpected, leading to the unpredictability of the design process. When a design process becomes predictable it is no longer a *design* process but merely a *building* process (Stolterman and Russo 1997).

The word chaos comes from the Greek *khaos* or "abyss, that which gapes wide open, is vast and empty." In modern times, chaos has come to mean a complete lack of structure, a state of utter confusion of things. In contrast, hierarchy implies structure and order, a state where relationships are known and fixed. Chaos is a force of creativity because it forces the mind to search for patterns – to find order in new ways or to take disparate items and find a pattern within or between them. When random elements are introduced into a situation, or when a whole is taken apart and elements are strewn about randomly, new patterns, or new ways of looking at a problem, emerge.

The process used by the pre-eminent American designers, Charles Eames(1907-1978) and his wife Ray Eames (1912-1988) illustrates the creative process and paradoxical relationship of pattern and randomness. As described by Ray Jacobson (2003):

> First they decomposed a design program into its myriad components and subcomponents, a hundred subtasks for every major task. Then they analyzed the smallest parts one by one, striving with each successive evaluation to choose the one design alternative that equaled or surpassed in quality the choices made before. Meticulously the Eameses arrived at the nest of the small parts and then, just as rigorously, assembled these unit by unit, until the resulting product represented the sum of a thousand excellent decisions. Paradoxically, the result frequently stunned Charles and Ray themselves, since the effect of their method was indeed often greater than the sum of its parts.
>
> And yet, the Eameses were also masters of intuition, for the process of taking apart the pieces and putting them back together again was conducted in a context of simple elegance and beauty whose rules resided in their minds alone. If the final products of their labors were honed and fine-tuned to within an inch of excess, still the conception of these products was an act of creation unique to the Eameses' sense of proportion and propriety and their overall genius (pp.7-8).

The process of design described here resembles Follett's "circular response," the object grew only through relation to the part that had been created just before and the part that was in the process of creation. At the same time, the creative process emerged only from a state of randomness or chaos, where all the subparts were strewn about, waiting to be formed into new patterns and a new whole.

A holistic view fragments the hierarchical pattern

The concept "circular response" and a holistic view of organizations are essential to Follett's organizational construction. Taken together, they create such a deep-seated foundation that it is worth asking if this is the reason why Follett's organizational view has always been left in the shadows compared to the partitioned and hierarchical organizational construction of scientific management. Circular response can be seen as the reverse of hierarchy and thereby also to scientific management and the management theories of the twentieth century that either criticise or build on Taylorism. Follett's and Taylor's views are so totally different in their assumptions about the character of the organizational construction that they are seemingly impossible to blend.

Whether or not this alternative foundation repressed Follett's theories in favour of Taylor's, Follett and designers have the holistic view in common. Most design schools consider it essential to teach their students to have what Johansson (2006) labels "a zoom-camera" to instantly go between details and holistic views and to see how details can make the whole different. Designers often work with details and are trained to be careful about details. However, they do not stay on the detail level but rather jump between different scales.

The holistic view has consequences for the collaboration between designers and other groups such as marketers, engineers, and top management. Designers do not pretend to be experts in either marketing or engineering. However, in order to work with the combination of form and function and take production aspects into account, they need to have sufficient knowledge of other disciplines to be able get help from these other areas. This help cannot be in a hierarchical relationship, because no discipline can be above the other. It is rather a relation like that of consulting –but the question is who is consulting whom– in the best case it is a mutual consulting and collaboration within what Follett labels as "the law of the situation." The law of the situation means that participants do not bother about having control over other people, but having control and power over the (common) situation. It means going from a hierarchical view to a view where the problems at hand and their solutions are at the core of the interaction and relationship. This way of looking upon the situation is very similar to what designers describe as their task (Lawson 1997) – they want to solve problems and do not bother about the official rank of different persons but rather think only about who can contribute to the solving the problem at hand.

In the study, that prompted the connection between Follett and the designer, Johansson (1998) found that when workers turned from a more fragmented and hierarchical perspective where they "did what we were told to do" task-by-task to a situation where they had responsibility for an area of their own, they started to think in a more holistic way and that, according to the workers themselves, this sense-making was very different from the fragmented one. Also, thinking in a holistic way not only meant solving the problems at hand, but also meant claiming other information and equipment from their bosses and people in other parts of the organisation, because these things were needed to solve the problems they had defined for themselves. So, having a holistic approach meant being much more demanding on other people than having a more restricted view and only looking at tasks from a narrow perspective.

For designers, having a holistic approach may mean that a solution in product development requires changes –or in other ways influences– marketing, production, strategy or other functional areas. When a designer crosses the borders between disciplines, she may find new solutions, but she will also find new conflicts, especially if the unit on the other side of the border has a more hierarchical view. Difficulties that occur when members of design teams collaborate across disciplines is well-recognized. Research has been conducted into collaborative design processes and the integration of both technical and social aspects, and ways in which design team members interactively make sense of a project (Cumming and Akar 2005, Fischer 2004). Much of this research uses hierarchically-related terminology, such as centralization or decentralization, or draws on structuration theory (Giddens 1984) and focuses on computer modelling to approximate the structure and relationships involved. But, we argue, the act of modelling and generalizing itself creates a preferred solution, privileging this one above others, and placing certain positions at nodes of communication. Instead, if following Follett, the situation at hand is the focusing element, and it is one that is always evolving as relationships are created and changed as knowledge is exchanged. The design process is created through non-hierarchical relationships. Or, as Tom Kelley, the general manager of IDEO, has described the ideal designer, among "T-shaped persons," who are deep in at least one field while knowledgeable in many. He describes the process of communication across disciplines as one involving empathy, thereby creating understanding without dominance (Kelley and Littman, 2005).

INVITATION TO THE DANCE

The dance within the discursive triangle of Taylor, Follett and Designers

What then, we ask, are the discursive elements that problematize relationships in design management/the management of designers? Certainly, much of the discourse

of current management thought and practice (including standardization, the quality movement, and lean production that are all important to design work) can be traced back to Taylor's way of thinking. Even those who critique Taylor's work often rely on the discursive grounds of scientific management—the hierarchical view, the notion of reporting to one boss, and responsibility as something commodified, etc. (Johansson 1998). Both those in sharp critique of Taylor work and those following him like disciples, rely on some of his discursive ground of rational thinking, omitting creativity like a cleaned skeleton omits the flesh.

When taking the management area as the point of departure, Taylor and his discursive followers are not well suited to communicate with the design area. Indeed, designers often complain about the managerial world and its lack of understanding of the requirements and the character of design. Scholars of design and design management often claim that in order to integrate design in a true way, a deep understanding of art and/or design is needed in top management (Svengren 1995, Borja de Mozota 2003, Bruce and Cooper 1997). A new discursive platform needs to be constructed.

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The need for understanding between design and management might be taken as a requirement that management should always adjust to designers. However, this is not our claim. Rather, we think that managers need to talk with designers and understand design in a different way in order to arrive at a communicative level of mutual understanding. Follett's discourse, which is built upon circular response, creative interaction and non-hierarchical relations that constantly change within the interaction, may be a place to embark for communication between management and design. We also believe that the discursive character of much of mainstream management thinking is such that creative thinking is repressed. Going even further, which we do not attempt in this paper, a discursive analysis of the communication between designer and manager from a feminist point of view might show that there is a similar repression between the managerial culture and communication as there is between the women's culture and main stream male culture.

From the notion that there might be discursive differences underlying the problems in communication between the designer's world and the managerial world, we have chosen in this paper to focus on the hierarchy – non-hierarchy dimension. We take the power dimension as surrogate for differences because we presume that most social theories of power –and even more so theories of power and organizations– presuppose a notion of power that is hierarchical, whereas Follett's notion of power proves a definitive statement of non-hierarchical power in organizations. Hierarchical power is the basis for most variants of Marxist theories, Weberian theories on bureaucracy, critical management theory, and indeed most managerial thinking about organizations. Notions of power like Foucault's discursive power tend to relate power to domination, thereby constructing a hierarchy between the dominated and the oppressed. While any one of these theories of power may underlie a particular manager's world-view, we are not interested in uncovering the specific theory, but rather to reveal how hierarchical versus non-hierarchical differences make a difference in communications and understanding.

We also see a vital link between design and non-hierarchical organizations. Maybe the structured creativity of designers needs a non-hierarchical environment in order to thrive. The interface between non-hierarchy, designers' requirements, and traditional management is the core of our research focus and interest.

Designers trying to dance with(in) the organizational hierarchy – concluding reflections

Dancing is a good metaphor for both professional and private relations. A times dance may enable individual expression, but it takes two to tango –and it is not a good collaboration if one partner tries to dance tango and the other one a foxtrot– though it may be possible to dance both to the same music. Dance as a means of exploring the organizational world is a subtheme in the upcoming European Group for Organization Studies 2007 Colloquium (www.egosnet.org/conferences/colloo23/sub_28.shtml). Our analysis in this paper can be summarized through the dance metaphor.

What sorts of dance are designers invited to dance within the organizational world? On one hand, we might continue with argentine tango, which is a complex and creative dance, because it allows both partners to elaborate on their own or to

follow the subtle signals of the partner who takes the lead. For the tango, dancers must learn the steps, and also the signals and ways in which elaborations alter the flow of the dance. On the other hand, we might take, for example, the form of the square dance, which has a prescribed choreography to be followed. Here dancers rely on the "caller" who manages the interrelationships among the dancers, provided the dancers bring to the dance the capacity to perform the required manoeuvres. When we take the metaphor of dancing for design management, we sense that the company invites participants to a tango that turns out to be a square dance.

The designer is expected to create and deliver something that is hard to deliver and even harder to create within a hierarchically constructed organizational world. This actually puts the designer in a similar situation as women are claimed to be in by feminist researchers – not seen and not being able to exist and perform on their own terms and capacities. Or, even worse, their capacity and qualities not even being seen or recognized. The designer is like the woman in a square dance – someone who has prescribed steps set by the caller and who must look like everyone else. However, if dancing the tango, the woman is valued for the (dramatic) perspectives she brings to her role in the partnership. Similarly, the hierarchical organization is like a prison for the creativity and the linking between different perspectives and competencies that is a vital part of the design profession.

What to do? We have not aimed to provide a simple solution, rather we wanted to point out the very deep and foundational problems that exist in the relations between designers and hierarchical companies. Rather than being depressed by uncovering these problems, we believe that recognizing and conceptualizing them is an important first step in "solving" them or changing the situation.

We see a number of possible lines of development. First, currently there is a tendency to try to break up hierarchies in general in the society as well as in companies. But this tendency to prescribe flat or networked structures is a theoretical one; at the same time companies and cities are becoming bigger and, in practice, more bureaucracy is required, so that hierarchical power remains Second, we recognize that many successful design process are going on in smaller and medium-sized companies and companies with an entrepreneurial spirit, suggesting that entrepreneurial characteristics may underlie relationships between management and design. Third, design may be emerging as a meta-concept that is so valuable that it creates its own rules and dictates the form of relationships with management. Foundational to all three of these possibilities is a deeply inherent relational problem. It's a wonder that there is any dance at all!

Developing the dance steps: Plans for empirical research

Initially, we had planned an exploratory empirical component for this paper. Our research question was to explore design manager's understanding of non-hierarchical power in organizations through interviews with prominent designers in Sweden and the United States. However, an early interview based on a framework of Bourgone's self-questioning method (Bougon 1983, Woodilla and Forray forthcoming) revealed that our conceptualization of power relations as researchers was far different from that of practicing design managers. Our initial unstructured interview format based on asking designers to first formulate their own questions related to non-hierarchical power did not create the dialogue we expected; we needed to spend time explaining the concept, suggesting that designers may not conceptualize power in this way. However, when we reformulated our interview questions more directly in terms of relations between designers and managers or workers in other functional areas, our interpretation of the transcript clearly identified connections with Follett's work, and the interview transcript revealed themes related to Follett's discourse of non-hierarchical power in organizations. For example, when asked to reflect on power and hierarchical organizations, one Swedish designer said,

> I can look at it from the designer's point of view, or from the end user's. I like "end user" rather than customer – and would like design to be a sort of advocate for the end user, while at the same time of course helping the company. In that case it has to be shared power – between the company and the designer or between the end user and the designer. I want to be sure about the quality – the values of the customer and also the business ideas of the company. I very seldom look on design as power --more as shared value-- values of the

end user and company – and the designer's job should be to coordinate this.

The designer has power – as impact on the development of the company. It can be like putting a dangerous tool in the hands of a child. The designer knows how to use it, but very often misinterprets the idea or puts himself in the idea. Many companies do not know what they are ordering – the brief is very poor. The designer has a tool to lift the company and to make it successful but if it is a poor design, it can be a disaster for the company. The designer has power and capacity from a business point of view. (Swedish design manager, August 2006)

These quotes show this designer's views of organizational power to be complex and quite unlike power concepts traditionally used in describing organizational work. We subsequently decided to take additional time to develop interview questions based on our analytic armchair theorizing and to then return to the empirical investigation to find illustrative patterns and empirical evidence as well as more nuanced descriptions of the problems that we here have notified from a more strictly theoretical point of view.

Concluding reflections

In this paper, we have revisited an erstwhile prophet of management –Mary Parker Follett– and constructed her holistic theories of management in as an alternative, and oppositional, discursive foundation for management theories to those of Frederick Winslow Taylor. We added the designer to create a triangular relationship, finding that there are many similarities between Follett and designers, but that the designers most often have to dance within an organization ruled by descendents of Taylor. Incongruities in relationships established within traditional hierarchies may be one the reasons for the difficulties most designers have in getting working conditions that they find appropriate for their work and why, design, as shown by researchers (Svengren 1995), is an underused strategic resource. Our planned empirical investigation will explore how non-hierarchical organizational relations may facilitate both the designers' work and the organizations' possibility of taking advantage of the designers' methods and results.

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COMPLEXITY – DESIGN'S PROPER SUBJECT

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- a foreword, 7 chunks of ideas and an outlook

Abstract

Designing is a fuzzily defined field of various activities and artefacts and chunks of knowledge. Theories about design foundations often evoke the impression of Babylonian confusion. The reasons for this "mess" can be located in the "non-fit" of theories and subject field. There seems to be a comparable interface problem in theory-building as in designing itself.

"Complexity" and complexity theory sound promising at first glance, but turn out to be problematic and not really helpful concepts. I have argued in many cases for a more appropriate application of systemic and evolutionary concepts, which -in my view- are able to model the underlying generative structures and processes that produce the visible phenomenon of complexity. This allows to specify more clearly the "knowledge gaps" inherent in the design process. This aspect has to be taken into account as constitutive of any attempt at theory-building in design, which can be characterized as a "practice of not-knowing".

I conclude, that comprehensive "unified" and formalized complexity theories run aground on the identified knowledge gaps, which allow neither reliable models of the present, nor reliable projections into the future. On the other hand, design has always possessed the competence to manage complexity. Examining these communicative processes more clearly may provide designerly contributions to complexity theory and practice, not vice versa. New tools for design and innovation processes will deal with complexity by designing complexity.

Foreword: Complexity – some sceptical remarks

"Complexity" has been one of the buzzwords in design and design theory for at least 10 years now. Design is facing "the challenge of complexity", design is "embracing complexity", and so forth. Complexity theory is promoted as the new meta-tool for dealing with complexity. But what is complexity actually? Is complexity in design the same as complexity in complexity theory? This would make things much easier. One may solve this question once and for all, as for example Bar-Yam (1997) does at the very beginning of his seminal book by defining:

- *complex = consisting of interconnected or interwoven parts / not easy to understand or analyze, and*

- *complexity = the amount of information needed to describe it.*

These are perfect definitions with regard to formalized approaches and algorithms, as in cellular automata or in well-defined multi-agent systems. But, to give a simple example: What is the amount of information needed to describe the emotional relation of a user and his/her object of desire, which may be essential for the success of a new product?

John Horgan, in his June 1995 *Scientific American* editorial entitled "From complexity to perplexity", mentions 31 definitions of complexity and states the lack of a "unified theory". Mikulecky (2003) follows Horgan and argues that complexity is the result of the failure of the Newtonian Paradigm (which represents the world as simple mechanisms) to be generic:

"Complex systems and simple systems are disjoint categories that encompass all of nature. The world therefore divides naturally into those things that are simple and those things that are complex. The real world is made up of complex things. Therefore the world of simple mechanisms is a fictitious world created by science or, more specifically, by physics as the hard version of science. This is the world of the reductionist. It is modelled by the Newtonian Paradigm and simply needs sufficient experimentation to make it known to us. Those experiments involve reducing the system to its parts and then studying those parts in a context formulated according to dynamics. ..."

The way science is done is the modelling relation. We observe the world around us and try to make sense out of that sensory information by calling the events that make it change as we observe causality. We encode the real-world system into another system, a formal one, which is completely under our control. Once we think we have an appropriate formal system and have found an implication that corresponds to the causal event in the real world, we must decode from the formal system in order to check its success or failure in representing the causal event. This worked for a long time and is tremendously successful. But observers came up with aspects that the Newtonian Paradigm failed to capture and a new explanation was required. Mikulecky (2003):

"Complexity was born! This easily can be formalized. It has very profound meaning. Complexity is the property of a real world system that is manifest in the inability of any one formalism being adequate to capture all its properties. It requires that we find distinctly different ways of interacting with systems. Distinctly different in the sense that when we make successful models, the formal systems needed to describe each distinct aspect are NOT derivable from each other."

Irreducible "knowledge gaps" are showing up, and there will probably never be such thing as a "unified theory" of complexity. This is why I recommend to skip the concept of complexity, or rather to use it as a metaphor denoting our limits of knowing, and to turn back to the older underlying concepts of system and evolution (Jonas 1994 – 2005).

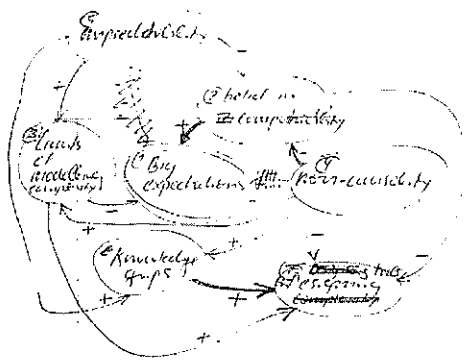


Figure 1. Complexity & design - 7 chunks of ideas.

Figure 1 represents my complex plan for the following deliberations: a network of 7 interconnected chunks of ideas. It is, in principle, undecidable from a logical point of view where to begin. But, of course, it is highly relevant from a rhetorical point of view, where to start the argument.

1 Big expectations

We were and still are facing "big problems", indeed. We don't have to elaborate on their nature here; they reach from satisfying more or less trivial user needs to modelling intervention strategies for changing people's behaviour in the face of global scale challenges. Weaver (1948) states the programmatic claim that mankind will have to learn to deal with problems of organized complexity within the 50 years to come.

"...These new problems, and the future of the world depends on many of them, requires science to make a third great advance, an advance that must be even greater than the nineteenth-century conquest of **problems of simplicity** or the twentieth-century victory over **problems of disorganized complexity**. Science must, over the next 50 years, learn to deal with these **problems of organized complexity**..."

Holland (1993, quoted in Horgan 1995) just reformulates the claim, introducing the concept of Complex Adaptive Systems (CAS):

"Many of our most troubling long-range problems - trade balances, sustainability, AIDS, genetic defects,

mental health, computer viruses - center on certain systems of extraordinary **complexity**. The systems that host these problems -economies, ecologies, immune systems, embryos, nervous systems, computer networks- appear to be as diverse as the problems. Despite appearances, however, the systems do share significant characteristics, so much so that we group them under a single classification at the Santa Fe Institute, calling them complex adaptive systems [CAS]. This is more than terminology. It signals **our intuition that there are general principles that govern all CAS behavior**, principles that point to ways of solving the attendant problems."

Since designers started to theorize about their activities, there is the deep longing for "scientisation", for "foundations", for unified/unifying theories, that might be able to overcome the deficits compared to other disciplines. Systems and now complexity theory seem to offer relief. Cross' (2001) observation comes to mind, that there are 40-year cycles in design theory. Weaver's concept of "organized complexity" was still quite vague but useful for further considerations: a more or less limited number of different elements in close dynamic interrelation – very design-like. The character of the elements and their interrelations was left open, i.e. they could mean almost everything.

Today we have dozens of definitions of complexity, from fuzzy (highly metaphorical, rich in associative meaning) to formal (without any semantic content). Which results in perplexity. Operational concepts are still rare. So, what have we learned since the first wave of systems thinking in design some 40 years ago?

2 Belief in computability

The faith in computers and the concept of trans-disciplinary applicability is a remaining characteristic of many areas of systems thinking. Some critics see a tendency of research "to degenerate into computer hacking". Herbert Simon sees people "infected with mathematics" (quoted from Horgan). I do not intend to follow this generalizing critique, since I have applied computer models in many cases myself. The example (Figures 2 and 3) deals with processes of supply and demand, consumer preferences etc., and aims at intervention strategies towards sustainability. It is really impressive (mainly to oneself rather than to others) to see the apparently good relationships of model and reality: Eureka, I found a strategy for promoting more sustainable patterns of consumption! And, furthermore, it is a kind of "reward" for tedious programming efforts.

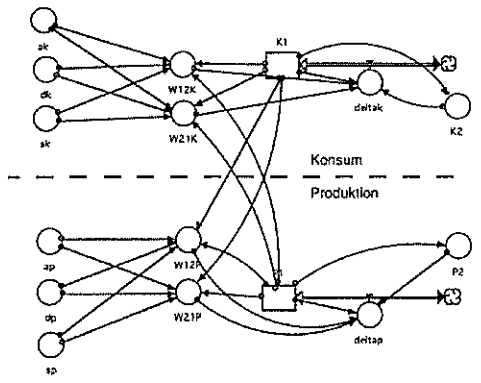


Figure 2. Model of the production - consumption dynamics in a market (Stella II block diagram, from Jonas 1994).

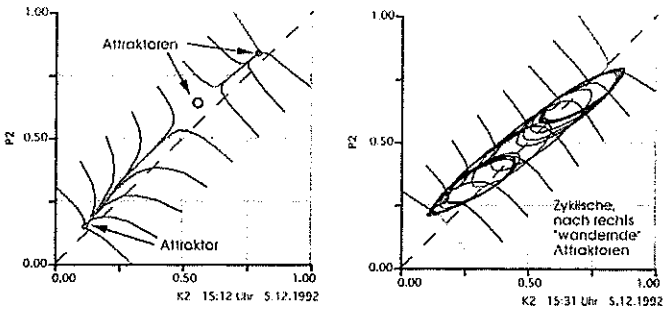


Abb. A 8: Simulationslauf Beispiel 2, Szenario 2. Abb. A 9: Simulationslauf Beispiel 2, Szenario 3.

Figure 3. Simulations with different consumer preferences and market parameters (Stella II phase diagrams, from Jonas 1994).

Too many simulations or simulators suffer from what Cowan (in Horgan 1995) calls the *reminiscence syndrome*: "They say, 'Look, isn't this reminiscent of a biological or physical phenomenon! 'They jump in right away as if it's a decent model for the phenomenon, and usually of course it's just got some accidental features that make it look like something."

It does not make sense at all to abandon computing approaches. But we have to think more carefully about the

inherent limits of modelling complexity and we have to ask the question: *which type of computer applications are useful?* Otherwise we are caught in the mental track or trap of: *"Here is the solution – what was the problem?"*

3 Limits of modelling complexity

The field of complexity seems to be based on a seductive syllogism (Cowan, quoted in Horgan 1995):

(1) There are simple sets of mathematical rules that when followed by a computer give rise to extremely complicated patterns.

(2) The world also contains many extremely complicated patterns.

Conclusion: Simple rules underlie many extremely complicated phenomena in the world. With the help of powerful computers, scientists can root those rules out.

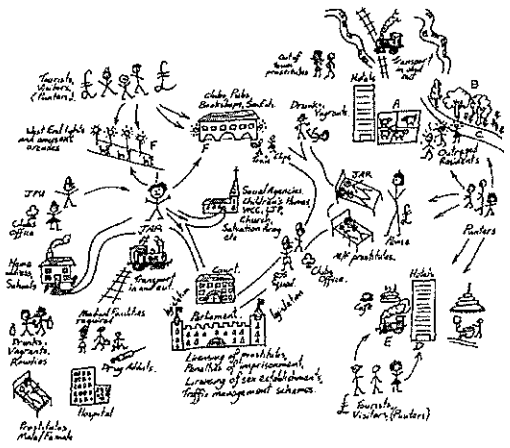


Figure 4. Rich picture of a design situation (Flood / Carson 1993).

But we have to accept that verification and validation of numerical models of natural systems is –in principle- impossible. The only propositions that can be verified -that is, proved true- are those concerning formal systems, based on pure mathematics and logic. Our knowledge of natural systems is always partial, approximate, at best. Natural systems (and psychic and social, if we want to follow Luhmann 1984, 1997) are autopoietic systems, which follow their own internal rules. We perform the shift from 1st order observation towards 2nd order observation (which is interpretation), or from 1st order methods to 2nd order methods, or from modelling to designing (Rittel 1971/72, 1972, Glanville 1982).

Modelling is poiesis / poetics. Oreskes and her colleagues (quoted in Horgan 1995) state:

> "Like a novel, a model may be convincing - it may ring true if it is consistent with our experience of the natural world. ...
> But just as we may wonder how much the characters in a novel are drawn from real life and how much is artifice, we might ask the same of a model: How much is based on observation and measurement of accessible phenomena, how much is based on informed judgment, and how much is convenience?"

Modelling is no longer descriptive but normative, a matter of negotiation and argumentation. Modelling means designing the problem and the solution simultaneously.

4 Non-causality

There seems to be a kind of hierarchical structure of levels of reality: physical -> chemical -> organic -> psychic -> social (the latter 3 can be denoted as autopoietic systems), with non-causality (irreducibility) between and, in parts, within the levels. These splits in causality considerably limit the degree of control we can act upon these phenomena.

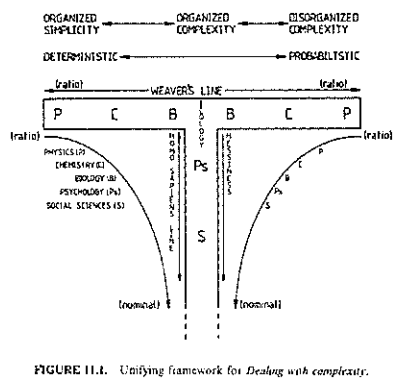


FIGURE 11.1. Unifying framework for *Dealing with complexity.*

Fig. 5: "Unifying framework for Dealing with complexity" (Flood, Carson 1993).

Flood and Carson (1993) combine Weaver's concept of organized complexity with assertions about the type of models that are suitable for different types of systems. They differentiate the degree of quantifiabilty, by means of the scales of measurement to be applied:

- rational (e.g. weight of objects),
- cardinal (e.g. temperature of a body),
- ordinal (e.g. sequence within a collection of things),
- nominal (e.g. names of persons).

In this figure we can "see" that the hierarchical structure of reality resists the "antireductionist" (as they call it) efforts of complexity theory, which tries to include all levels in one consistent model. At each stage, entirely new laws, concepts and generalizations are necessary. The different models are incompatible due to emergence phenomena. One could argue: Complexity theory is extremely reductionist, just because of its untenable anti-reductionist claim!

5 Unpredictability

Life (physical nature, biology, psyche, social systems) is shaped less by deterministic laws than by contingent, unpredictable, evolution-like circumstances and contexts. Luhmann (1997), in his main oeuvre, has developed an abstraction of neo-Darwinian evolution to describe the patterns of social evolution, which I consider useful for describing design processes. He differentiates the 3 causally de-coupled phases of variation – selection – re-stabilization.

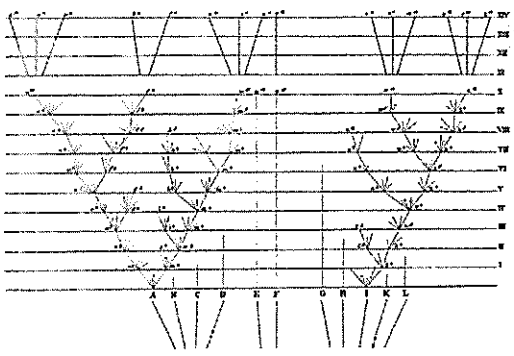


Figure 6. Bifurcation patterns in the development of variations of a species; the only figure in Darwin's "Origin of Species" (1859).

Circular feedback-processes of trial&error, which one may call learning, seem to be the driving forces on every level of the living world, including those socio-cultural processes, which we call planning or design. This leads to the problem of prognosis in design: we know where we come from, but we do not know where we are heading. Design methods researchers, without explicitly admitting that they are proposing evolutionary patterns, seem to know this. Existing process schemes reveal strong similarities to Darwin's bifurcation patterns. See for example Roozenburg and Eekels (1991).

To come back to the *reminiscence syndrome*: One of the most popular algorithms in complexity theory is Feigenbaum's logistic equation, a simple feedback mechanism, which can be used to produce this kind of evolutionary patterns: $x_{n+1}=r\,x_n\,(1-x_n)$.

That means, in a metaphorical way, we "see" that design is acting "at the edge of chaos", which is the limit, where causality fails.

6 Knowledge gaps

Again: Complexity theory, claiming to be holistic, integrative, anti-reductionist, etc. turns out to be extremely reductionist and simplifying. In its claim to provide a "unified theory of everything", or, to put it more ironic, a "unified theory of interesting things", it neglects the essential differences between system types and tries to reduce these hybrid networks of designed things and autopoietic systems into simple closed formalisms. Only advanced systemic and evolutionary approaches as sketched elsewhere in much more detail (Jonas 1994 – 2005) will have a chance to contribute to more clarity regarding the knowable and the unknowable and the borderlines between these regions.

Fig. 7 denominates the gaps between *autopoietic* systems involved in designing. Design has to overcome this fundamental systemic "obstinacy", which is attempted by means of nice and common, but fuzzy and inappropriate terms such as "authorship", "creativity", "subjectivity", "values", "trends", ...:

- *organisms* -> the "*function gap*", which indicates, that it is not a trivial task to adapt an artefact to an organism, for example, because bodies cannot speak...

- *consciousnesses* -> the "*taste gap*", which indicates, that it is not a trivial task, to coordinate individual consciousnesses, for example to optimise a solution for the 80 million consumers of the German market. They are all different, and they cannot speak about their taste in clear and distinct manner...

- *communications* -> the "*fashion gap*", which indicates, that it is not a trivial task to generalize a variety of information gathered from individual consciousnesses and to transfer this into the shape of an artefact, for example to plan a new collection of household goods for the Turkish market...

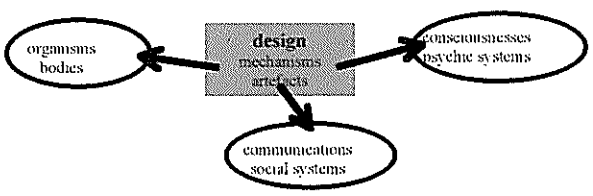


Figure 7. The "scandal of split causality", 3 autopoietic systems + design trying desparately to integrate them into a coherent whole (Baecker 2000).

7 Designing complex tools for designing

What does that mean for design and for the usefulness of complexity theory for design? I do not see any great potential in closed formal models, because we have to face the shift from representation to design. And designing means decision making under conditions of bounded rationality. The most advanced medium for bridging the irreducible knowledge gaps to arrive at decisions for acting is language / discouse / conversation. Concepts of complexity theory and formalisms from complexity theory can assist in this process. For example in supporting and structuring discourse (see the model of my initial sketch, fig. 1) through:

- collecting positions,
- documentig positions,
- negotiating positions,
- debating inter-relations,
- designing systemic descriptions of situations,
- asking "what-if? questions,
- etc.

Back to the initial question: *Which type of computer applications are useful?* Highly interactive, discoursive tools (supported by formal algorithms, of course) are able to support 2nd order observation processes among stakeholders.

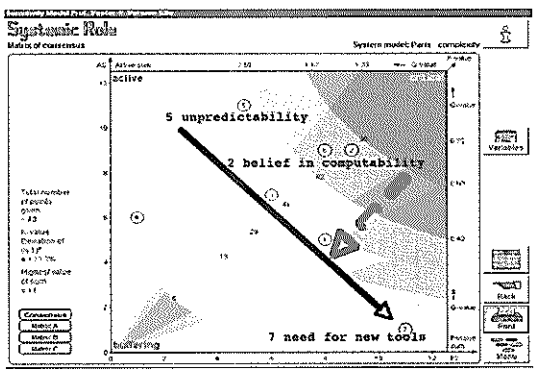
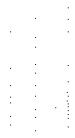


Figure 8. Role of elements in the discoursive system as introduced in fig. 1 (Sensitivity Model, see Vester 1999).

A possible interpretation of fig. 8: "The experience and acknowledgement of unpredictability may be an active driver to promote the insight into the need for new specific tools. This is critiallly influenced by the belief in computability or 1st order cybernetic models. Computers are helpful, but computing power is secondary."

Outlook

The perspective for design research seems to be: To find procedural approaches to deal with the behaviours of interacting *autopoietic* systems. In evolutionary terms, this means a shift from 1st order *prediction & control* towards 2nd order *learning and design*. Communicative skills are required for dealing with complexity. Without the societal embrace of scientific and technological development, no collective or individual meaning can be assigned to the production of complex new knowledge and artefacts. Without their embedding in persons and their relations, in things and in the self as well as in institutions, the necessary social skills to put this knowledge to beneficial use in concrete and heterogeneous situations, will not arise. Or, as Nowotny (2005, 28,29) puts it: *"A deeper theoretical understanding of complexity, not as a mathematical, but as a social phenomenon is required, which can be usefully guided by metaphors taken from mathematical complexity theory."*



Maybe now we have a better idea, why "designing for people" (Jones 1970) or even "for the real world", is so difficult: The entire real world is complex! Complexity science may be helpful here, but is not at all to be considered as a panacea. *Design is too complex for complexity science! New tools for design and innovation processes will deal with complexity by designing complexity. These approaches may turn out to be designerly contributions to complexity theory and practice.*

... to be continued.

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NATIONALITY INSCRIBED: AN ICONOLOGICAL ANALYSIS OF TURKISH DESIGN

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Abstract

Debates on establishment of an authentic Turkish design style being at its peak, Turkish designers frequently resort to concepts, motifs and symbols considered traditionally Turkish for original and creative ideas. One apparent strategy, in this regard, is to utilize such traditional elements in product styling. Thus, especially iconic use of these elements (the tulip-shaped tea glass, portraits of Ottoman sultans, the crescent and the star or the crescent alone, even hospitality) is often encountered under a common title, "Turkish design". These concepts, motifs and symbols can be called, after Panofsky's studies of Renaissance iconography, the Turkish design iconography.

The aim of this paper is, mainly, to study the way in which nationality is inscribed on product form and surface together with its ideological implications. For this purpose, an iconological analysis, a revised form of Panofsky's method with an emphasis on intertextuality, is applied to a number of products carrying references to the idea of Turkish culture, namely, the new Yeni Rakı bottle design and the tulip-shaped tea glass.

Biography

Harun Kaygan graduated from the Department of Industrial Design, METU in 2003, and acquired his MSc degree from the same department in 2006, where he is currently a research assistant and a PhD student. His Masters thesis included the discourse analysis of Art+Decor magazine pursuing the question how the concept of Turkish design is utilized to evaluate products. His research interests are design discourse, design criticism and national design.

Acknowledgments

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Introduction

In recent years, Turkey has witnessed a considerable and consistent increase in the publicity of "design" as a concept in general, and product design profession in particular. While the growth in the professional field is statistically observable (as in the growing number of design departments and increasing product designer employment in companies), there were also the ADesign Fair series, which later gave birth to the İstanbul Design Weeks, and other organizations smaller in scale, such as the Fesorient exhibition, which stimulated public interest on the subject. Such increasing popularity and extending accessibility of design (not only as it appealed to its potential consumers, but also regarding the extent to which people were subjected to its "products", in the general sense of the word) transformed the formerly marginal field of practice into an influential field of Turkish visual culture.

As a product of this transformation, an inventory of aesthetic and conceptual elements peculiar to Turkish design has emerged in the Turkish design discourse; either manifest in products or observable in written and verbal discourse. This inventory can be named "Turkish design iconography" after the Renaissance iconography on which Panofsky situated his methodology of iconological analysis (see Panofsky 1982).

Expression of nationality has gained prominence as a popular subject matter during the emergence of such an iconography, as evident in the extensive symbolic use of various elements

and concepts related to the the idea of Turkish-ness.[1] The popular movement of redesigning objects which are considered to be of Turkish origin, such as the tulip-shaped tea glass and the sofa, clearly illustrates this tendency. Another example is the recurrent use of certain surface elements, which have come to express nationality, on design products. Among these elements ornaments like Seljuk motifs, images like portraits of Ottoman sultans or panoramas of the Istanbul, and symbols like the crescent can be counted. Even occasional references to the so-called essential character of Turkish people can be observed, as in the way Ayşe Birsel indicates the reference in her design, Resolve office system for Herman Miller, to the theme of hospitality (cited in Özdemir 2004), which is conventionally referred to as one such character in popular discourse.

Within the framework roughly drawn as such, the paper aims to subject Turkish design iconography and its inventory of symbols of Turkish-ness to an iconological analysis. First, a method which is appropriate for the purposes of such an analysis will be outlined and, then, utilized to inquire a number of Turkish design products about their iconographical associations and question the assumptions they rest on and reproduce.

Iconology: A methodological outline

As defined by Panofsky, iconological analysis consists of three elaborately defined steps. The first level, namely, the "pre-iconographical description", is the interpretation of how "objects and events" are expressed by "forms". Depending on "practical experience", it is simply the recognition of factual and expressional elements in the work analyzed (Panofsky 1982, p. 28). Translated into semiological concepts, which are more familiar to design researchers than concepts imported from art criticism, this first level is akin to denotative level of meaning in semiological analysis (Van Leeuwen 2001, p. 100).

Then, the second level of analysis can be interpreted as the connotative level of meaning in a Barthian analysis (Van Leeuwen 2001, p. 101). "Objects and events" analyzed at this level, which Panofsky calls the level of "iconographical symbolism", are assumed to express (or to connote, in semiological terms) specific "themes and concepts" (Panofsky 1982, pp. 38, 40-41). The image of an apple expressing the concept of original sin in Renaissance painting is one worn-out example of an analysis at this level.

Though Panofsky draws attention to the historicalness of every level of interpretation, this particular level requires additional emphasis on the historically and culturally determined character of meaning: It necessitates a "knowledge of literary sources" of the period in question (Panofsky 1982, pp. 40-41). This aspect can also be interpreted as the dependence of iconographical analysis on an intertextual field, comprising not only literary sources but also other images or verbal discourses.

The third level, or the level of "iconological interpretation", involves, according to Van Leeuwen, a search for ideological meanings (2001, p. 101). In Panofsky's words, "it is apprehended by ascertaining those underlying principles which reveal the basic attitude of a nation, a period, a class, a religious or philosophical persuasion – qualified by one personality and condensed into one work" (1982, p. 30). It is this level that gives the iconological method its significance – as well as its name, for it is, according to Argan, more a synthetic process than an analysis, going beyond mere description and attempting a reconstruction of the conditions of existence of the image in question (1980, p.18).

However fruitful it may appear, adaptation of the methodology for contemporary design criticism bears certain theoretical difficulties. Most importantly, there is an inherent essentialist tendency within Panofsky's method: At the iconological level of interpretation, Panofsky argues that "themes and concepts" –which were expressed by "objects and events" at the iconographical level– express "essential tendencies of the human mind" (1982, p.41).

Panofsky's above mentioned comment that there exists a basic attitude of a nation, which is observable by iconological

[1] Here I avoid the term 'identity' for it refers to a particular sociological concept, and follow Barthes -and his translators- in his neologism that produced the terms 'Italianicity' and 'Basquity' (see Barthes 1985 and 1984).

means, is another manifestation of this essentialist position. Elsewhere, he even uses the method to excavate the essence of the English nation from within the style of the Rolls Royce radiator and its so-called antecedents (Panofsky 1995). Its essentialism put aside, such a nationalist political position identifiable in his work is exactly contrary to the aspirations of this particular paper.

A revised methodology to analyze Turkish design iconography

One way to tackle this question of essentialism is to rethink it as a problem regarding the way iconology approaches images. Foucault, in the Archeology of Knowledge, criticizes the way in which preceding theories endeavor to delve behind the surface of documents in order to reveal concealed themes, thoughts or representations (Rose 2001, pp. 138-139; Foucault 1972, pp. 6-8, 138-140). Iconological analysis, too, both theoretically and methodologically aims to penetrate the surface appearance of paintings. At each level of interpretation another layer of meaning is peeled off, until the so-called hidden essence of the nation, period or class it symbolizes is reached.

As demonstrated above, Van Leeuwen's perspective, which structurally compares iconology to semiology and indicates the compatibility of two methods (2001), is useful to understand the function of each level in Panofsky's analysis. But then, Rose insists on the possibilities that discourse analysis could offer to iconology, because of their shared concern for intertextuality (2001, p.147). Following Rose, a particular reading of iconological analysis as a non-penetrative method, which stresses the importance of the intertextual field within which the image is created, comprehended and valued –or devalued– as such, may help to overcome the theoretical problem indicated above.

A revised iconographical level of analysis, then, should emphasize the intertextuality of the iconography in question. It should aim to pinpoint the intertextual connections through which an image (or product) acquires a particular meaning (in this case, national meaning), and attempts to guarantee its reception in that particular way. Likewise, Argan refers to the field within which iconographical meanings are in circulation as the "cultural terrain":

> Without those conventions which form a sort of code common to artist and spectator, the work would be indecipherable, and art, not acting on a specific and accepted cultural terrain, would not collaborate, as it does, to modify that terrain. (Argan 1980, p. 20)

Iconographical symbolism – and the transformational power of the discursive field back on itself –depends not only on the existence of those common codes; i. e., an iconography familiar to the artist and his/her audience alike, but also on the shared assumption at the cultural level that images are meant to be read as such, that is, by reading the symbolisms inscribed upon the art work by the artist (Cowling 1989).

This comment on the artist, however, should not lead one to the conclusion that the aim of iconological interpretation is to reveal the original intentions of the designer. Indeed, Panofsky, too, referring to the iconological level of analysis, underlines that symbolic values "are often unknown to the artist himself and may even emphatically differ from what he consciously intended to express" (Panofsky 1982, p.56). But, neither is the aim to reveal that "essence" – be it religious, national or class-based – which implicitly guides the artist's production beyond his/her intentions. Rather, iconology should follow discourse analysis as described by Rose, and focus on those "claims to truth, or to scientific certainty, or to natural way of things" (2001, p.154), which are produced by the introduction or utilization of a certain iconography. In this manner, iconology can deal with the categorizations, delimitations, and subjectivities constituted in the discursive field which is articulated by the iconography in question.

The context of analysis

Panofsky's methodology for analyzing the symbolic use of visual elements in Renaissance art is based on and justified by its audience's belief that the proper mode of appreciation for works of art is by correctly reading the symbolic meaning inscribed on them. Similarly, the fact that the contemporary Turkish design community is more than willing to recognize and appreciate the so-called authentic elements of Turkish culture that are converged into the product's totality is what makes the Turkish design products readily yield to an

iconological analysis[2]. In other words, Turkish iconography roots from and is maintained by a common interest in and the knowledge of those elements; that is, forms, images and concepts, which are considered to be authentically Turkish by the Turkish community.

This recent recourse to the concept of nationality as a reference point for product design in Turkey and the corresponding public interest in its products can be explained as a consequence of the recently accelerated articulation of Turkish designers to the international design field. Increasing number of industrial designers from Turkey working abroad and the growing competition in Turkish market as many manufacturers in Turkey started to employ foreign designers have been very influential in this regard.

Moreover, for the international field of industrial design is primarily organized into national categories; as in German, American, Italian, Japanese, Spanish, Scandinavian and Dutch designs, the design field in Turkey is to assume the position and the name Turkish design. Indeed, in the global field, any geographical isolation of a design style is valid; i. e., enters circulation, as long as it is defined in terms of nationalities. In so doing, national borders override all other possible geographies, as exemplified by the impossibility of an Aegean design, or redefine them in terms of national styles, such as when Southern European design is conceived as Italian and Spanish design styles added together. Therefore, the dynamics of the force field, which is maintained by the worldwide discourse on product design, necessitate the introduction of the category of Turkish design. Needless to say, this category is assumed to have an essential character, which gives birth to a corresponding authentic style; namely, the Turkish design style.

The idea is reflected in two distinct manners in the governing design discourse in Turkey. There is, on the one hand, a mostly shared aspiration of the Turkish design community to devise a trend and a brand name for Turkey and Turkish design, as a strategy towards attaining international market success. To accomplish this, it is argued, Turkish designers should turn to all that is genuinely Turkish as a resource to constitute a Turkish design style. On the other hand, there is the popular argument that Turkish designers are responsible for searching for their so-called roots within Turkish culture, where originality and richness lie. In fact, two viewpoints are intrinsically linked by, first, the idea of a common purpose and collaboration that supports both and, second, the sources both approaches recommend utilizing.[3]

Analysis of the new Yeni Rakı bottle as a representative of the contemporary Turkish design iconography

It is within this context that Turkish designers increasingly turn to objects that are conventionally considered to be genuinely Turkish. I have already counted a few in the introduction, namely, the tulip-shaped tea glass, the sofa, Seljuk motifs, sultan portraits, the Istanbul silhouette and the crescent. However, the iconography under analysis is not limited to these. According to Bakova (2003), for instance, what he calls "originalities" ["*orjinallikler*", my translation] constitute a long list comprising *divan*, sofa, turquoise color, dervish, *harem*, the Turkish bath, felt, *döner kebab*, *İznik çinisi*, Turkish delight and fez.

One significant example to be included in this collection of objects is *rakı*, an anise flavored liquor which is considered to be Turkish, and specifically of Aegean, origin. The significance of *rakı* in this particular discussion on Turkish design iconography lies in the fact that Yeni Rakı, the oldest *rakı* producer and the former state monopolist on *rakı* production in Turkey, has lately redesigned its bottle as the competition increased with new producers entering the market. The new bottle, designed

[2] Regarding how the Turkish society has lately become very sensitive to political meanings as connoted by products in general, a recent newspaper article about a pond built in Kayapınar, Diyarbakır is quite illustrative. According to the article, it was argued that the contours of the pond were inspired by "the imaginary map of Kurdistan", and the four artificial waterfalls symbolized the division of Kurdistan between four states: Iran, Iraq, Syria and Turkey. The mayor, on the other hand, insisted that the indented contours were meant to give the pond a sense of naturalness. (Bu çok ... 2007)

[3] It is impossible to discuss these arguments in detail within the limited space this paper provides. See Aksu 2004, Buğdaycı 2004, Mutlu 2004 for different versions of this argument, see also Kaygan 2006 for an extended study of these justifications evident in the discursive field of Turkish design.

by Gamze Güven, is very expressive of the theme of Turkishness this paper is engaged with (see Figure 1).



Figure 1. Yeni Rakı bottle, design by Gamze Güven.

At the pre-iconographical level of analysis, the bottle puts emphasis on the perfectly clear quality of the liquor. Its broad neck expresses a strong masculine character, which is in contrast with the elegant feminine curve of the body. This challenging contrast and the quite characteristic curve are worth discussing in detail: What does the curve express iconographically? And within which intertextual connections is it situated?

First, the curve can roughly be classified as an oriental curve, another recent application of which can be found in Akan's "Istanbul Alphabet" project exhibited in Istanbul Design Week 2006 (see Figure 2). Especially Akan's ornaments, sculpted as objects of mere formal appreciation, resemble *alems* (metal crescent icons placed on top of minarets) or Seljuk and Ottoman helmets.

These curvilinear forms, in opposition to modernist aesthetics with its geometrically well-defined forms, assume an irrational, emotional and even feminine position. Interpreted iconologically, therefore, the significance of oriental curves is that their presence activates a series of oppositions: modern/traditional, rational/irrational, masculine/feminine, Occidental/Oriental. Iconological analysis will be continued below, and for now, it is sufficient to state that the new Yeni Rakı bottle design approaches these oppositions cautiously and consciously. The curve is not "too oriental", it is very refined and still modern; even its femininity is on the verge of becoming a softened masculinity.

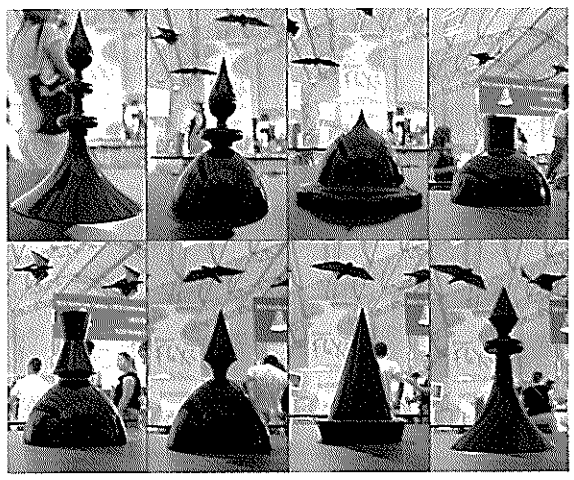


Figure 2. "Istanbul Alphabet" Ornaments, design by Erdem Akan. Photos by Harun Kaygan, from Akan's exhibit at Istanbul Design Week 2006.



Figure 3. Tea glass by Mudo Collection.

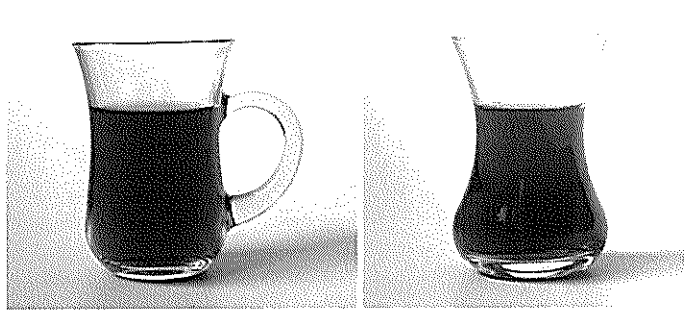


Figure 4. Tea glasses by Paşabahçe.

Second, the curve in question can be read as a modern interpretation of the slim-waist of the tulip-shaped tea glass, which is another fundamental element of Turkish design iconography. The particularity of the slim-waist lies in the recent interest directed on it as a popular subject matter of design, accentuated by the proliferation of new tea glass designs in the last few years. Paşabahçe and Mudo Collection, for instance, have presented a number of such glasses, low-profile commercial products, studying the tulip form (see Figure 3 & 4). Yet, more noteworthy designs were those presented by Erdem Akan and Faruk Malhan, with more refined, modern interpretations of the glass. (see Figures 5 & 6) Both designs share with the Yeni Rakı bottle design this subtlety, which is manifest as a cautious distance from the oriental as well as the vernacular. It is this very distance that motivates the appraisal of Akan's and Malhan's designs above other glass designs as "design products" – and also it is that which elevates the new Yeni Rakı bottle above other designs in the market, such as those of Mercan or Efe Rakı, which prefer ornamentation to express "tradition".

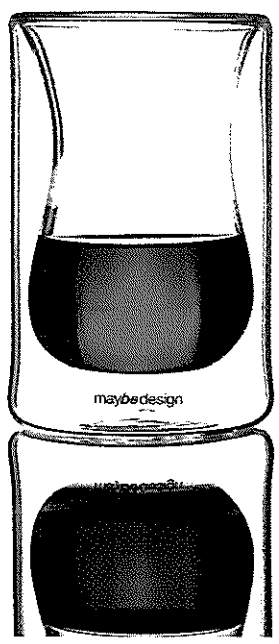


Figure 5. 'Eastmeetswest' tea glass by Erdem Akan, Maybe Design. Photograph by Erdem Akan, published under permission.



Figure 6. 'Istanbul' tea glass design by Faruk Malhan, produced by Paşabahçe. Photograph by Koleksiyon, published under permission.

Akan, himself, in an interview published in *Art+Decor*, positions his design in the middle of this territory, which is suffused with ideological meaning, by intertextually connecting its product to the oppositions listed above as East/West, curvilinear/linear:

> Despite our mostly Western outlook, thank God, our feelings and thoughts are still Eastern. How could this unusual state in between be better expressed than a hybrid form with a straight exterior and a tulip shaped interior? (Akan 2004, p. 64. My translation.)

Akan's statement is a part of the discursive field of Turkish design, of course, and it involves an attempt to point to, underline or even establish the intertextual connections that give his design meaning.

Both Akan's statement and the observations above suggest that the tea glasses or the rakı bottles are intertextually positioned with respect to each other, or to certain discursive concepts such as the oppositions mentioned above. And as far as the iconological analysis has revealed, it is a series of orientalist oppositions that the products reproduce in this manner.

Another statement with a similar function was offered for the new Yeni Rakı bottle. After comparing the *rakı* bottle to non-Turkish liquor bottles such as whiskey and cognac, which have distinct identities, Türkoğlu-Güven states that *"rakı*, which we call 'our national drink', had a packaging which was no different from an ordinary alcohol bottle" (2005, p.90. My translation). The comparison involves a discursive maneuver to situate the meaning of *rakı* as *the* authentic Turkish drink, and the new bottle design as a Turkish design, comparable in style to other alcoholic beverages. Furthermore, implying that properly designing the *rakı* bottle is Turkish designers' responsibility, it connects with the popular arguments of collaboration and responsibility in Turkish design field, which were mentioned above.

Then, it is not only the idea of Eastern-ness that is expressed in the curvilinear body of the bottle, but also a national character. Yet, it is not limited to the new Yeni Rakı bottle, which prefers formal qualities to ornamentation to achieve this end. The tea glasses, which were already located with respect to the modern/traditional (or vernacular) dichotomy above, are fundamental for the ongoing iconological analysis, as well.

An early representative of the interest in tea in general is the redesign of the tea maker's tray by Defne Koz. What is visible in Koz's concept is the implied valuation of the totality of the tradition within which tea is served. There is, indeed, an indispensable connection between the tea glass and the so-called Turkish tea ritual or tradition. Akan, once again, states that,

> Maybe no form is as 'Turkish' as the tulip-shaped tea glass. This glass, which is the chief performer in Turkish tea rituals, is known to belong here, no matter from where and how it has come. (Akan 2004, p. 64. My translation.)

The term tradition has a certain sense, when utilized in this manner. It is considered an ahistorical source of national meaning and a transcendent essence that is manifest in all Turkish products, as if it were "a sort of umbilical cord stretching from the present [...] to some point of origin in the dim, distant past" (Du Gay et. al 1997, p.71). Only through this particular sense of tradition can rakı be maintained as *the* Turkish drink, and the slim-waist as "belonging here", free of history. Furthermore, discovery and realization of that essence, which is always already manifest in and through products, becomes Turkish designers' principal responsibility, while the Yeni Rakı bottle is constituted as an always-already-Turkish product, as are the tea glasses and the tea tray.

Conclusion

In this attempt to subject the new Yeni Rakı bottle to an iconological analysis, the iconography that situates it as a Turkish design product has been discussed. It was demonstrated how its bodily curve was connected to oriental curves and the tulip shape, and how this connection functioned to situate the product as Turkish, yet modern. Eventually, at the iconological level, the way in which a particular version of "tradition" and certain oppositions were reproduced and naturalized by these products and the intertextual field in which they belong was discussed.

Because of the particular way in which "tradition" is defined in the discursive field, the set of iconographical connections within which the products are named "Turkish designs" are generally offered as proofs to their Turkish character. This is not unrelated to the theoretical problems of Panofsky's version of the method, which was discussed in length above, for Panofsky, too, is inclined to use the iconographical field within which the Rolls Royce radiator is designed to prove the existence of an essential British character (1995).

Yet, according to Hobsbawm, traditions are *invented*: Such translation of customary practices; i. e., customs, conventions and routines that take place much less invariantly in a society, into national traditions is a process of formalization and an infusion of symbolic meaning (1993, pp. 2-3). It is clear that this concept of *invention* of traditions is exactly contrary to the idea of a search for and the *discovery* of traditions, and it calls into question the very role of product design with respect to the traditional. Because it is design that properly situates the product within the intertextual field so as to constitute it as a Turkish design, any design activity that facilitates tradition as an aesthetic or conceptual resource involves an invention of traditions. Following Hobsbawm, it can be argued that the very process of redesigning tea glass, or *rakı* bottle alike,

is an invention of tradition in this sense, for it includes the formalization of customary practices of tea serving.

Then, the idea of discovery of traditions, and the related concept of tradition as a transcendent essence, have a fundamental discursive function. They conceal the process of transference of national meaning upon the product and naturalize the otherwise constituted character of tradition. Futhermore, even when national symbols are set in motion for seemingly disinterested aims, such as making tourism profit or searching for mere originality in design, it can be argued that these concepts activate a nationalistic yearning for a hypothetical past time, a golden age, and an accompanying attempt to construct and reproduce national history as "a seamless and unbroken continuity towards pure, mythic time" (Hall 1999, p.38).

In addition, one of the aims of this paper was to devise a preliminary sketch for a comprehensive inventory of Turkish iconography. During this analysis, I have already gone through a number of objects which are influential in this intertextual field, including the *rakı* bottles, series of tea glasses, the tea tray by Koz and the oriental ornaments of Akan. Yet, the iconography is not limited to those. There are, in fact, several curious discursive formations awaiting analysis, such as the representations of Istanbul in Yeditepe Istanbul lighting, designed by Lunapark for Phare Aydınlatma, and Gaia&Gino products by Karim Rashid, or sultan portraits, used as graphical elements in the Xstanbul project by Genco Demirer and İsmail Hakkı Gülal, and the B-Türk project by Reha Erdoğan and Tween, or Seljuk motifs in Şah cutlery, designed by Can Yalman and produced by Hisar, and Selçuk separator by Lunapark. For the analysis of all these iconographical formations, I propose that the methodological sketch I have just devised should be useful as an analytical tool.

Such a comprehensive listing and an intensive analysis of those iconographical symbolisms utilized in industrial design to inscribe national(ist) expressions upon products, with an emphasis on the intertextuality of the solution space where designers work, would not only be quite helpful to understand the regimes of representation active in visual culture in Turkey, which is not restricted to product design, and to study its history, with all the ruptures and breaks; but also it would help to guide design practitioners and to inform them of any possible aesthetic, moral or political pitfalls they may come across during their practice.

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THE CONCEPT OF FUN IN PRODUCT DESIGN FOR DIFFERENT AGE GROUPS

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Abstract

This paper aims to explore the underlying dimensions of fun in consumer products and mainly focuses on arousal conditions of fun at different age groups. An empirical study was conducted to reveal users' understanding of fun and the attributes of products that they associate as fun. Three age groups are identified for the study: 25-35; 35-45; and 45-55. In total, 30 participants (10 from each group) were interviewed. Interview questions intended to highlight participants' understanding of fun in products. Accordingly, they were asked to describe fun, and to give examples of objects that they found to be fun. The keywords collected from the participants were analysed using content analysis method and then grouped under four subject headings: visual, functional, usability, emotional context.

Introduction

Extensive studies in design field have led the researchers to focus on more personal and ephemeral concerns. Fun, as one of the dimensions of pleasure has become a hot topic within design and emotion discourse. The arousal conditions of fun such as, provoking unusual perception, attracting, capturing attention, creating surprise and challenge, have mostly been studied within human computer interaction (HCI). Although the literature on fun in relation to HCI is such extensive, inadequate emphasis has given for how fun can actually be employed and measured in product design context.

User preferences are highly influenced by emotional values of products. Besides usability, the importance of emotional responses to products was pointed out by some researchers in the design field (Carroll & Thomas, 1988; Desmet & Dijkhuis, 2000, Desmet & Hekkert, 2002, Denton & McDonagh, 2006). In ergonomics field there is also a shift towards the human driven design process which leads to studies on emotional and aspirational needs of users (Chibber, 2006). Positive emotions, like fun, are important and providing their eliciting conditions is the major objective in HCI. Norman (2004) in a parallel view emphasizes the rise of interest on the positive emotions, which have not been very popular until recently. Consequently, the subject of fun as a research area changed its position from sidelines to the centre (Blythe *et al.*, 2004).

Being a positive emotion, fun has an influence on the desirability, pleasurability and among all, usability of products. The arousal conditions of fun are stated by Carroll (2004) as attracting, capturing and holding attention, provoking unusual perception, surprise and challenge. The experience of fun can be also created by products that are challenging, seductive, playful, surprising, memorable and rewarding (Djajadiningrat *et al.*, 2000). However, explaining the underlying aspects of fun and how it could be applied to product design is quite challenging to achieve. As much as being appealing, emotions in general are intangible. Their volatile, ephemeral structure also brings difficulties in in-depth studies with emotions (Desmet, 2002; Hassenzahl, 2004).

Fun is studied in very general terms in literature and its successful application into product design requires more specific data to be taken into consideration, for example, socio-economic groups and gender. It can be said that age differences is one of the influential factors in the conception of fun in products. This paper aims to explore the underlying dimensions of fun in consumer products and mainly focuses on arousal conditions of fun at different age groups. Therefore, an empirical study was conducted to reveal users' understanding of fun and the attributes of products that they associate as fun.

Interviews with Different Age Groups

In-depth interviews were carried out with the aim to find out what aspects of products were perceived to have fun according to different age groups. The intention was to compile a rich variety of keywords highlighting the fun aspects in products.

Three age groups were identified for the study: 25-35 (Group A); 35-45 (Group B); and 45-55 (Group C). In total, 30 participants (10 from each group; 17 males and 13 females) were interviewed. Group A represented the young population who have been working and have regular income, but have not yet settled life style. Group B represented the middle-aged population who are working and relatively had a more settled life style. Group C represented the upper-middle age who are retired (or likely to retire in the near future) and have completely settled in their life.

The participants were first asked to describe fun with their own words. It was believed that they could have much easily given their opinion in relation to their experiences, and the feelings occurred during that time. Therefore, the participants were also asked to give examples of objects that they found to have fun aspects. The objects were not limited to a single use environment (e.g. home, office) or the ones that they owned themselves.

Each interview session lasted between 20 to 45 minutes and each session with each participant was carried out separately. One-to-one sessions were carried at work environment or homes of the participants. In addition to audio recording, notes were taken in relation to the keywords and phrases mentioned by the participants. Where possible, the images of the objects mentioned by the participants were taken during the interview. Some objects could not be archived since they were not owned by the participants. All sessions were completed in two weeks.

Results and Analysis

The answers to interview questions revealed rich information about the aspects of fun gathered from the participants' own experiences and the objects they talked about. A total of 153 keywords were collected from all participants about fun objects. As an observation, the number of products therefore the constructs mentioned by the participants decreased in parallel with the age increase (Group A: 85; B: 43; C: 25). Group A was relatively more relaxed and willing to talk about their fun related experiences with products compare to Groups B and C. The keywords collected from the participants were analysed using content analysis method and then grouped under four subject headings: visual, functional, usability, emotional context.

- visual (aspects related to colour, form, material. e.g. "enjoyable colour, visually dynamic form")
- functional (aspects related to function, e.g. "having more than one function, fulfilling its function perfectly")
- usability (aspects related to ease of use, comfort, simplicity, e.g. "giving feedback, easy to clean")
- emotional context (aspects related to the personal appraisal, e.g. "having memorial quality, that can be shared with friends, something relaxing me")

Unlike the variation in the number of keywords mentioned, their distribution according to the four subject headings presented a similar distribution for all age groups (Figure 1).

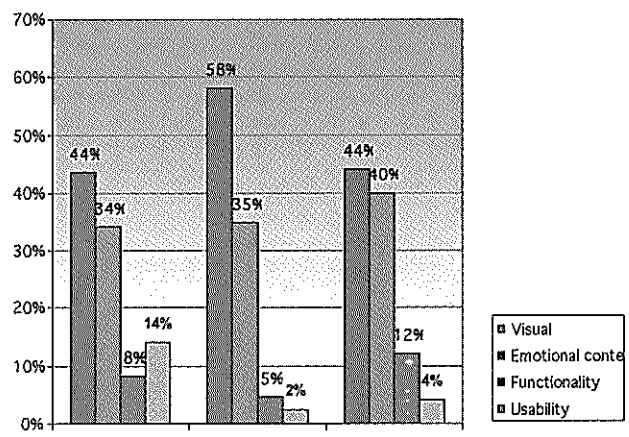


Figure 1. Distribution of the keywords according to age groups and subject headings

General observations. In general, number of keywords mentioned for emotional context and visual aspects was

relatively higher in all age groups. When the total number of keywords was considered, usability and functionality aspects did not appear to be as significant as emotional context and visual aspects for the conception of fun in objects.

It is observed that when asked about their conception of fun, people were more likely to talk about activities than the characteristics of products that were enjoyable for them. Accordingly, the objects that the participants named as fun usually had aspects similar to the activities that they defined as fun. For example, watching TV was mentioned as a fun activity since it was also relaxing. Then relaxing objects were given as examples.

a) Visual aspects. The frequency of the keywords mentioned within this category was considerably higher in all age groups (Group A: 44%; Group B: 58%; Group C: 44%). Aspects related to visual qualities such as, geometry, form, material, surface finishing and colour were found to be closely related to fun in products with a frequency of 49% for the total of all participants. Main phrases that are based on visual aspects and used for the description of fun in objects can be stated as unexpected geometry, continuous change in form, dynamic look, movement, unexpected proportion, unexpected size, unexpected colour, shiny look, light colours, vivid colours and translucent material.

Among the visual aspects, unexpected or unusual visual qualities that somehow created a *surprise* factor (e.g. having unexpected form; proportions or colour compared to other products) were mentioned repetitively as a significant aspect of fun in products.

b) Emotional context. The frequency of the keywords mentioned within this category was the second highest for all age groups (Group A: 34%; Group B: 35%; Group C: 40%). They were based on the personal appraisal of respondents. The most common phrases that addressed emotional context can be stated as "something that has memorial quality, that can be shared with friends, that reminds the things loved, that makes someone relaxed, that one can impute personality, that can be personalized, that offers a novel thing every time of use, that gives out challenge, that makes someone think over and that is mysterious".

It is seen that these factors are the ones that reflect the condition of respondents' ability to add-on the object and to interact with it. The thing that makes the object fun for them here is the added-value that is mostly personal oriented. One of the participants mentions about her elephant curio which has a fun aspect just for her. She defines it as:

> "It exists at my home since I was a child. It has a very funny story and memory for me. I want to see it every time I need to so I place it in sight."

The interviews revealed that *challenge* and *relaxation* were the two most significant factors in relation to emotional context. Expectation of relaxation was the highest in the middle-aged Group B (60%), followed by Group C (40%) and Group A (10%). Expectation of challenge was the highest for the youngest age Group A (70%). This value decreased down to 40% for Group B and to 30% for Group C. The oldest Group C marked a significant rejection to challenge in fun objects (70%).

c) Functionality aspects. The frequency of keywords mentioned within this category was relatively lower. The main phrases for this aspect are stated as something that is useful, that carries a function (not only for visual satisfaction), that is multifunctional, that fulfils its function in a good way. Functionality expectation was the lowest for Group A (30%), whereas it was a lot higher for Group B (80%) and for Group C (90%).

d) Usability aspects. As with the previous category, the frequency of keywords mentioned within this category was also relatively lower. Ease of use expectation was found to be at its highest for Group C (80%), followed by Group B (70%) and Group A (40%). Aspects related to usability are stated as something that gives feedback to the user's actions, that is comfortable, that is easy to use, that helps (makes me do my work easily), that is easy to clean, that can be used with less effort than usual.

Within the categories of usability, functionality, emotional context and visual aspects that were repetitively mentioned and showed considerable differences were found to be: *challenge, ease of use, usefulness, surprise* and *relaxation.* Different age groups showed different level of expectations of these aspects. The participants also presented opposing views to whether a

product should or should not comprise them in order to be fun.

Challenge

Expectation of challenge is highly related to personal appraisal. Participants had varied opinions for challenge in fun products. Figure 2 illustrates the **distribution of challenge expectation between the age groups**. Overall, 46% of the participants mentioned a level of challenge expectation as a fun aspect in products, whereas 54% of the participants were not keen on challenge.

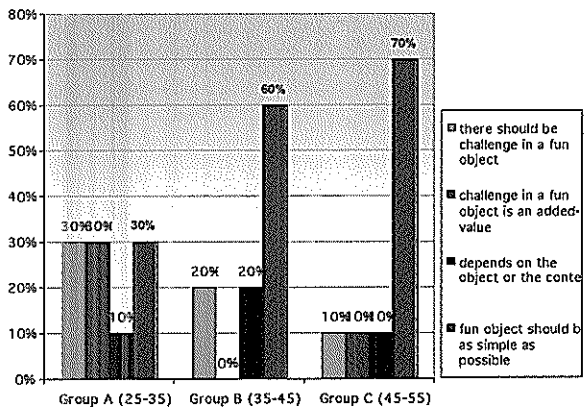


Figure 2. Distribution of challenge expectation between the age groups

According to the participants' statements, expectation of challenge was observed in four levels: i) there should be challenge in a fun object; ii) challenge in a fun object is an added-value; iii) expectation depends on the object or the context; and iv) fun object should be as simple as possible.

Challenge in products was found to be a favourable aspect by some participants and described with the following phrases: a level of complexity that will require labour, arousal of curiosity, and an existence of puzzle-like characteristics. Example of such product can be seen in Figure 3. Some other products mentioned in terms of expectation of challenge are described as below:

Puzzle
"It is a mechanical puzzle...very mysterious. It is a hard job to solve it. I could only solve after reading its manual."

Wrist watch
"It is very complicated; it won't let me read the time easily. But this complexity becomes fun for me. I would like to own it."

Mechanical orange juice maker
"I preferred this mechanical one instead of the most common electrical ones. It is not that much easy to use. You have to turn the handle and pres with power many times. I like its mechanical mechanism and enjoy while making my juice."

Rubic cube
"It is fun for me to solve it but once I solve it, there is no need to do it again. It falls from my favour; I want to work on a different type of puzzle."

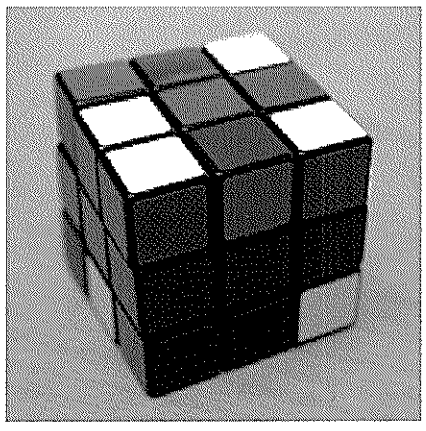


Figure 3. Example of a challenging object: 'rubic cube'

The level of challenge expectation is decreased with the increase of age (Group A: 30%; Groups B: 20%; Group C: 10%).

Some participants mentioned that challenge in a fun object is an added-value (Group A: 30%; Groups B: none; Group C: 10%), whereas some said that their challenge expectation was dependant on the product or the context (Group A: 10%; Groups B: 20%; Group C: 10%). Contrastingly, some participants argued that challenge was not required for fun objects and products should be as simple as possible. The expectation of simplicity increased significantly with the increase in age. (Group A: 30%; Groups B: 60%; Group C: 70%).

Ease of *Use*

As one of the main parameters of usability, ease of use concerns with if a product can fulfil its function without a need for an extra effort. "That helps me doing my work easily, that can be cleaned easily, that is practical, that I can use with less afford, that doesn't make me tired" are the phrases mentioned for ease of use in fun. Objects described for this aspect can be stated as below:

Salad maker
"It has a plane to cut the salad and a container below. You cut and fill the container. It makes my work easier. It is fun to make salad with it. It makes me eager to make salad."

Toaster
"I enjoy very much making toast with this toaster. It is very easy to clean when compared to conventional ones."

Figure 4 illustrates the **distribution of ease of use expectation between age groups**. Overall, 63% of the participants mentioned ease of use as a requirement of fun aspect in products, whereas 37% were not keen on.

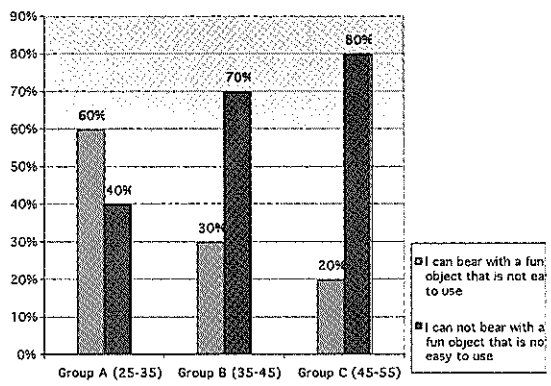


Figure 4. Distribution of ease of use expectation between the age groups

The expectation of ease of use was lowest for Group A (40%). This value increased in parallel to increase in age (Group B: 70%; Group C: 80%). The youngest Group A had more tolerance (60%) for a fun object that was not easy to use, whereas this ratio decreased in the older Groups B (30%) and C (20%). This constitutes a contradiction between usability and fun at this point that preference of fun diminishes the demand for ease of use.

Usefulness

Here, the expectation of usefulness refers to satisfying a regular need that means carrying a function not being used only for visual satisfaction. It was stated as an expected value for fun by participants in their definitions. Samples from objects described in terms of their reference to expectation of fulfilling a function are stated below:

Grater with container
"It is fun for my daughter but it is not for me because that container is meaningless."

Nail clippers
"It brings out its function in the way I needed. I enjoy using it, I enjoy talking about its fun."

Standing dishwasher brush
"It is sticked near the kitchen sink to the base, standing straight. Yes it looks enjoyable but I wouldn't keep it there if it was only visually fun."

Its frequency of expectation varied considerably in different age groups. Figure 5 illustrates the distribution of usefulness expectation between age groups. Overall, 67% of the participants mentioned a level of expectation of usefulness in fun, and 33% of them stated that usefulness was not needed for fun.

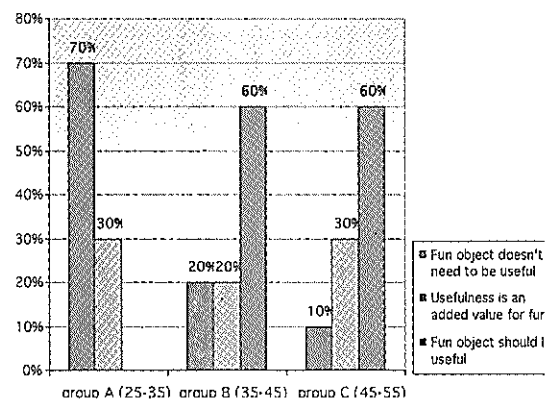


Figure 5. Distribution of usefulness expectation between the age groups

According to the participants' statements, expectation of usefulness, that means fulfilling a function, was observed in three levels: i) fun object should be useful; ii) usefulness is an added-value for fun; and iii) fun object does not need to be useful.

The first level indicates the participants' direct expectation of usefulness. It can be seen that the youngest Group A did not mention any direct expectation of usefulness, whereas usefulness was important for the other two age groups (Group B: 60%; Group C: 60%). The second level considers the usefulness as an added-value in fun products. This was mentioned by the participants in Group A and C (both 30%) with a decrease in Group B (20%). The third level shows that usefulness is not a must for obtaining fun in objects. This was strongly mentioned by the youngest age group (Group A: 70%), whereas decreased gradually in other groups (Group B: 20%; Group C: 10%). It can be seen that as they get older expectation of usefulness becomes higher for the participants.

Surprise

Surprise in products was found to be a favourable aspect by the participants and described in relation to unexpected product characteristics, such as unusual geometry, size, proportion, function or colour. It was described with the phrases like surprising geometry, different proportions than the normal, unusual size, unusual form and distinct colours & materials (different than the common).

The strongest descriptions about surprise as a fun aspect are made for the following products:

Amorphous shaped ashtray
"It is an ashtray but it doesn't look like an ashtray with its amorphous form."

Marvin Robot
"Its unexpected proportion of the body makes it fun for me, different than the human body proportion."

Furniture for children
"The children furniture at IKEA are fun for me. They are like the adult furniture in appearance but in a scaled size than normal."

Diamond eye pencil sharpener
"I don't use it for sharpening my pencils I leave it on my desk since its form is funny, only its visualisation. It doesn't look like anything, this makes it fun. If it was in the form of cat or dog I wouldn't find it funny."

Duck compass
"It is sticked on the window of the car, this upside-down position makes it fun for me and its form of a duck. It is totally different than the existing compasses."

Sony Shuffle MP3 player
"While it shuffles you see a mix of numbers changing continuously. Unexpected numbers are passing until it stops and plays."

Metal bottle opener
"It is fun to use it, its metal and different form makes it fun to use although it is not easy to."

Lemon juice maker
"It is made of translucent blue plastic. Its normal posture is tilted what makes it different. It is something more than functionality, it makes me surprise. I enjoy using it."

Figure 6 illustrates the distribution of surprise expectation between the age groups. Overall, 47% of the participants mentioned about direct expectation of surprise, and 53% mentioned about surprise as an added-value.

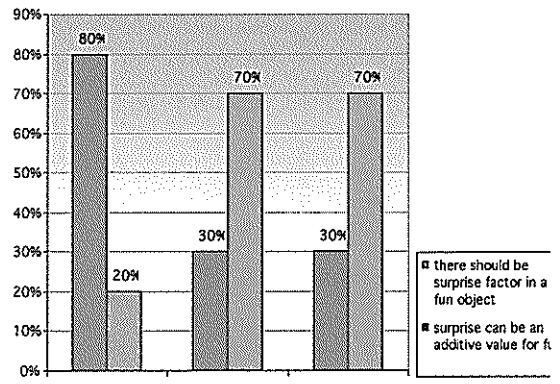


Figure 6. Distribution of surprise expectation between the age groups

According to the participants' statements, expectation of surprise was observed in two levels: i) there should be surprise element in fun objects; and, ii) surprise is an added-value for fun.

The first level indicates the direct surprise expectation. It is significantly higher in Group A (80%) when compared to Group B (30%) and Group C (30%). It can be said that the expectation of surprise as a necessity is at its highest for the youngest age group. Example of a surprise aspect in a product can be seen in Figure 7. The red, flossy pen with an unusual form and material also had a hidden feature that was discovered during its usage: a flashing light which appears whilst writing.

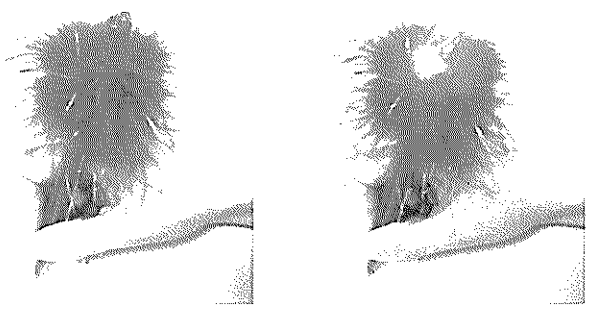


Figure 7. Example of a surprise factor in products: pen with a flashing light

It is usually the case that surprise aspect in a product wears off and loses its novel perception after the product's first use. This was the case for the red pen in which the flashing light eventually lost its unexpectedness in its consequent usages.

Relaxation

The results revealed a new aspect of fun in products that was not come across in literature: *relaxation*. The phrases stated for this condition are the following ones: "taking my tiredness, making me relaxed, removing my stress and something that I don't need to think about anything while using". Some of the participants stated that daily life has become very stressful because of work and that they come to define fun as '*having condition of being relaxed*', and the fun objects as '*the objects that are relaxing them*'. The objects they described are the following ones:

Liquid lamp
"That lamp has a liquid container and the movement of the liquid creates light effects inside. It makes my eyes rest while looking. It is fun for me to look on."

Massage tool
"It is a hand tool. I use it on my body and this relaxes me."

Fretsaw
"I used it first in the crafts courses while I was at school. It is fun to use it because it removes my stress."

Continuous movement metal balls
"Office environment is very stressed that I need some objects that relax me. But its fun aspect should not be so visible, since it is a formal space. This continuous movement metal toy is fun for me at the office. I look on it for a while and relax."

Swing
"Swing is fun for me since everything is under control, I don't need to use my mind, I don't need to think about anything."

Figure 8 illustrates the distribution of relaxation expectation between the age groups. Overall, 37% of the participants mentioned about the expectation of relaxation, and 63% mentioned that relaxation is not a necessity factor.

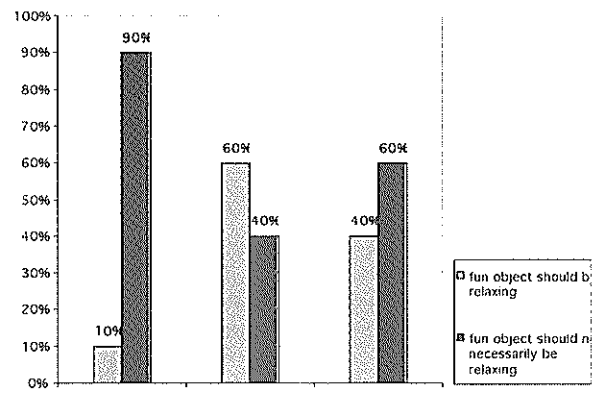


Figure 8. Relaxation expectation between the age groups

Relaxation expectation is varied significantly between the three age groups with the highest value in Group B (%60), followed by Group C (40%) and Group A (10%). In parallel to this, majority of the Group A participants did not see relaxation as a necessary aspect for objects to be fun (90%), followed by Group C (60%) and Groups B (40%). Examples of fun objects given by the participants covered both visual and functional aspects in their relaxing features. For example, objects with a continuous movement give relaxation with their calming effect; massagers with their functionality; some decorative lights with their eyes soothing effect.

Discussion and Conclusions

Fun is a challenging topic of research due to its idiosyncratic structure. It is also an exciting area to work in product level. The study focused on conception of fun in product at different age groups. The findings revealed that different age groups have different conceptions of fun in products. When the three different age groups are compared, some common aspects with similar frequency levels existed, such as emotional context and visual aspects.

In the concept of fun between three age groups the main variable was the participants' individual concerns. The nature of the concerns varied according to the ages. For example, new materials, new functionalities, and new ways of experiencing or doing things were some of the concerns for the young population. Whilst a satisfaction given by a product though its functionality, ease of use, cost and material were examples of the concerns for the older age groups. When these *concerns* are the appraisal conditions of fun, it would not be a surprise to expect that the underlying reasons are the expectation of challenge and surprise for younger groups, and usefulness, ease of use, and relaxation for the older groups.

Aspects like *functionality, challenge, simplicity, usability* and *surprise* are intensively discussed in literature as arousal conditions of fun, under the name of *fun-in-doing* (Schneiderman, 2004). However, relaxation or perhaps *fun-in-not-doing* was surprisingly appeared as an important aspect of fun for the oldest group (Group C), and the products carrying this aspect were stated as fun by them. The findings point out that for fulfilling expectation of fun for older groups it should also be intensively evaluated in product design.

Aspects related to usefulness, ease of use, and relaxation was mostly emphasized by the older groups (Group B and C), whereas aspects related to challenge and surprise were highly rated by the younger group (Group A). The effect of fun in consumers' preferences of products is undeniable. Therefore, these aspects should be taken into consideration when designing fun products for different age groups in a satisfactory level.

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DESIGNING PLAYFUL SENSORY EXPERIENCES WITH INTERACTIVE WHITEBOARD TECHNOLOGY: THE IMPLICATIONS FOR CHILDREN ON THE AUTISTIC SPECTRUM

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Abstract

By definition, individuals on the autistic spectrum have difficulties with social interaction and communication; their different cognitive and sensory processing occurs in every modality and can result in a perception of the physical world that is fragmented, alarming and very different from non-autistic people. This can lead to high levels of fear and anxiety and a lack of understanding of the intentions of others.

This paper will document part of the Reactive Colours design research project, which has been developing customisable software, called ReacTickles, to engage the unique sensory interests of children on the autistic spectrum and will focus on how the ReacTickles software is being used on interactive whiteboards with young autistic children in a number of UK schools. Whereas the conventional view maintains that educational technology should be interactive, Reactive Colours offers tangible interfaces as an embodied play activity. The benefit of this approach is, I argue, that it elicits outward expression of inner sensation and, as such, encourages greater bodily awareness in autistic children who experience distorted or even disconnected relationship with their body due to proprioceptive and vestibular sensory disorders. The interactive whiteboard removes the necessity to manage control in a confined space and, in so doing, reduces the impediment to bodily expression created by the limited spaces of traditional interfaces.

1. Introduction

"Play allows children to learn and practice new skills in safe and supportive environments" (Boucher, 1999)

Social interaction, communication and imagination are attributes most commonly associated with the play patterns of young children (Piaget, 1971; Vygotsky, 1978; Bruner, 1972). Children on the autistic spectrum, however, are understood to experience difficulties with these areas, which are often referred to as the triad of impairments (Wing, 1975), and as a result, they may express limited interest in the social, symbolic and pretend forms of play that are known to provide the foundation for how we understand and experience the world (Beyer and Gammeltoft, 2000; Jordan, 2003; Leslie, 1987; Sherratt, 1999).

Play is considered to be a reflection of a child's ability to interact with his or her environment, therefore the spatial and physical attributes of the play activity will have a direct influence on the mode of play; for example, some toys lend themselves naturally to pretence and imagination, such as cars and dolls, whilst others encourage exploration and repetition, such as spinning tops (Dominguez et al, 2006). These environmental factors are of equal significance in the design of digital play activities. The concerns expressed by other researchers whose work implies that computers can exhaust cognitive resources and are thus detrimental to health and learning, (Healy, 1998), and that open-ended opportunities for play are inhibited by the limited and repetitive operational actions of the technological experience (Levin and Rosequest, 2001), are based on the assumption that most activities will be located on a small screen and thus cannot be manipulated and explored in the same way as objects in the physical world, which would be more developmentally appropriate for young children (Plowman, 2003). Most children with autism have a limited

number of preferred play activities, but in their play they tend have a fascination for detail and the physical properties of objects and less interest in attaching symbolic meaning to the objects and involving others (Beyer and Gammeltoft, 2000; Jordan, 2003; Leslie, 1987; Sherratt, 1999).

This preponderance of sensorimotor play in autistic children has underpinned the development of the Reactive Colours project and the subsequent design of the ReacTickles interactive play experience. The designers, through working very closely with autistic children, realised that when perceptual and physical skills were engaged, in an appropriate environment, children were more likely to express themselves comfortably, and thus the opportunities for creativity and imagination were greatly expanded.

"If improving the play skills of children with autism gives them a sense mastery, and increases their pleasure and their motivation to play, then that is a justifiable aim in itself" (Boucher, 1999)

2. Understanding the autism condition

There are many complex theories which provide explanations for the apparent lack of social functioning described above, however, for the purpose of this paper I summarise the research which has been helpful in determining the context for the design of the Reactive Colours project, but do not aim to present a standpoint or bias towards any particular theoretical perspective.

2.1 Monotropic interest systems

Murray, Lawson and Lesser (2005), explain that one of the most significant differences between autistic and non-autistic is in the strategies employed in the distribution of scarce attention. Autistic people are understood to have *monotropic* interest systems, meaning that they are able to focus their attention intensely on a limited range of interests. In contrast, most non-autistic people have *polytropic* interest systems, meaning that they are able to divide their attention across many areas of interest and the focus of this attention is thus less intense, or 'tunnelled'. A consequence of this is that autistic people tend to be very good at tasks where attention to detail is required but may miss global meanings (Mottron et al, 2006; Frith, 1989). This is evident from a very early age, as suggested in the reference to play described earlier. Mottron et al (2006) find that higher-level processes are mandatory for typical people but not for people on the autism spectrum. These autistic atypicalities go hand in hand with sensory processing differences, which can have a disabling impact.

2.2 Sensory issues

The focus of this paper is on how tangible technologies can foster an embodied play experience for young autistic children; in order to explain how the design of the project was influenced by the young children and those who most closely care for them, I will describe the research in the context of three sensory experiences: tactile, vestibular and proprioceptive. These senses are central to how we experience, respond to and interpret the variety of stimuli in the world around us. Characteristic behaviours of an over or under-stimulated sensory system are biting, spinning, rocking and hand-flapping, and dysfunctions in any of these areas can lead to high levels of anxiety and a lack of understanding of the intentions of others.

The tactile sensory system enables us to respond to light touch, temperature and pressure; those whose tactile senses are dysfunctional may experience pain when being touched or when eating foods that have a particular texture, they may also have an aversion to clothing, water, or using their fingers. This mis-perception of pain may manifest itself in an individual becoming isolated, distracted, hyperactive and generally ill at ease (Bogdashina, 2003).

The vestibular system refers to the inner-ear structures, which assist in the detection of movement and changes in the position of the head. Children who are hypersensitive to vestibular stimulation may become upset by movement activities such as swinging, sliding, climbing and descending stairs or they may be apprehensive in activities which require spatial control; generally they appear to be clumsy. Continuous intense activities such as spinning and jumping are ways in which children try to stimulate their vestibular system (Bogdashina, 2003).

Proprioceptive sensory systems are those which provide a person with a subconscious awareness of body position

though muscles, joints and tendons. The proprioceptive system enables us to adjust our body positions in response to different situations, for example, sitting on a chair or walking down a step. Fine motor movements, such as using a knife and fork or writing with a pen are also manipulated though the proprioceptive system. A child with a dysfunctional propioceptive system may display unusual behaviours such as leaning on people or walls in order to feel pressure and for spatial orientation and will often appear clumsy or incompetent (Ayres & Tickle, 1980).

Autistic children may suffer from sensory dysfunctions in any or all of these areas and may be over or under responsive to sensory input; they may also fluctuate between extremes. Thus the behavioural characteristics most commonly associated with the autistic condition are directly correlated to issues of the sensory system (Ayres & Tickle, 1980).

3. Tangible interaction

Computers make an important contribution in assisting people in their daily lives. For individuals on the autistic spectrum the ability to manage, control, organise, learn, communicate and be creative is accentuated through the use of computer systems. There has been a significant amount of valuable research to show why computers are so important, (Murray, 1997; Murray & Lesser, 1997; Murray & Aspinall, A 2006), and there are many highly imaginative and informative websites, created and maintained by autistic people which are valid testimonials to this research (http://www.gettingthetruthout.org/; http://www.isn.net/~jypsy/).

"Computers offer rich opportunities for taking control and making a mark on the environment which, in turn, strengthens the sense of agency, personal achievement and self-esteem. The neutrality of the interface may also assist in encouraging shared activity whereby all participants are inherently equal, thus the capacity for joining attention tunnels is accelerated." (Murray, Powell and Jordan, 1997)

The Reactive Colours project extends this research by taking an alternative approach to computation. Rather than considering computer systems in the conventional manner as a means to control and manipulate digital information, our research uses computers to afford a tangible experience capable of assisting relaxation and encouraging expression and creativity through improvisation and experimentation.

The emergence of new types of computer technology encourages multi-modal interaction and renders archaic the notion that the role of the computer is purely to handle textual information. Tangible interaction includes a broad range of systems that rely on the creative use of physical and spatial manipulation to control objects or interfaces (Dourish, 2001; Ishii & Ullmer, 1997). As computation becomes more embedded in everyday objects and experiences, the role of tangible computing has the potential to extend far beyond the functional and is increasingly becoming adopted by artists and designers who identify with the expressive and aesthetic qualities of tangibles and the way these new technologies involve the use of more human skills than cognitive (Overbeeke, 1999). The perceived value of tangible interaction, in an educational context, is that it is driven by action rather than cognition (Heidegger, 1996, Norman, 1988; 1999)

In the earliest stages of development, young children prefer to play with objects because of their physical properties rather their abstract and imaginary qualities, (Piaget, 1971; Vygotsky, 1978; Bruner, 1972) for example, puzzles and building blocks and they are extremely attracted to sensory toys that engage them in self-directed, purposeful activity (Montessori, 1912). It has been well researched that children develop understanding through action, and the transformation of sensorimotor reflexes to more symbolic forms of manipulation (Piaget, 1971). Tangible technologies provide ways of interacting through exploration and manipulation; the focus is not on how things work or what they mean but on how they are used. This, I argue, is of enormous significance in the design of computational experiences for all young children, but particularly for autistic children, as this approach allows for improvisation and an opportunity to encounter experiences independently of skill, knowledge or task. For children whose complex sensory systems and difficulty with global meaning may result in exclusion from many play activities, tangible technologies have the potential to afford interaction during which meaning is created and understood through context and use rather than the necessity to understand a graphically mediated environment (Heidegger, 1996).

It is known that we encounter the world as a place in which we act and that through action, meanings are revealed, (Heidegger, 1996). However, for most of us, using traditional Graphical User Interfaces (GUIs) the logical process of interaction is to interpret a digitally represented task, and then to manipulate the environment with a physical object that has no specific behavioural or representational meaning (Fishkin, 2004). An example of this would be pressing a key or moving a mouse to perform many functions, all of which will have a different output, for example, menus, buttons, folders, and controllers (Ishii & Ullmer, 1997).

Tangible technologies enable a close relationship between manipulation through input and perception through output, and generally one function is assigned to an action. A more embodied experience results as the user can focus on the impact of their action rather than the tools that control it (Dourish, 2001; Fishkin, 2004).

4. The reactive colours project

The aim of the Reactive Colours project has been to define an expressive form of computation with a range of digital technologies in order to promote relaxation, encourage spontaneous play, and support learning for children on the autistic spectrum.

Many autistic children experience heightened feelings of anxiety and fear as a result of their highly focused interest systems and sensory differences (Grandin, 2000). By working directly with the target population, using methods briefly outlined below, the designers came to realise that the primary function of the software had to be to assist in creating a calm atmosphere, as without this, the positive aspects of play and learning available to children through the use of computers, could not be accessed. The context for use needed to be mobile and flexible to allow for changing technological and pedagogical processes and environments, and to encourage new contexts for creativity with computers that may arise as a direct result of using the software.

One of the outcomes of this process has been the creation of the ReacTickles software. ReacTickles experiences are completely directed by user input using a mouse, keyboard, microphone and other forms of adaptive devices. Significant to this research has been how ReacTickles are being used on Smart™ interactive whiteboards creating opportunities for unmediated interaction where the whole body can freely move, and where embodiment is being used purposefully to help children interact with each other and to engender a calm, positive learning experience.

The use of interactive whiteboards in schools in the United Kingdom has become widespread in the past two years. A typical interactive whiteboard set up consists of a computer connected to a projector, which simultaneously projects onto a large-scale touch sensitive whiteboard. Whilst some boards are reliant on the use of a stylus pen for interaction, Smartboards™ enable users to control their experience through the touch of their fingers; when used in this way ReacTickles become interactive surfaces, which the user can directly manipulate (Ullmer & Ishii, 2000). When children use their fingers on the interactive surface, the outward response to being touched or stroked is a corresponding movement, shape morph or colour change. The primary interest is on the screen output and not the operational tools, thus a fully embodied experience is afforded (Fiskin, 2004).

4.1 Research methods

As indicated throughout this paper, a flexible, ethnographic, participatory design process was required for this project in order to ensure that any proposed outcomes were driven by the specific needs of autistic children and those who are responsible for their care, this process has been well-documented in previous work (Keay-Bright, 2006), however I will provide a brief overview for the purposes of this paper.

The project has four main stages and uses a *Research-Inspire-Listen-Develop* model at each stage (Keay-Bright, 2007). The first stage of feasibility involved teachers and children helping the researcher define a positive playful environment that could be both relaxing and motivating for children and which could be seamlessly integrated into the school curriculum. This feasibility study led to a successful proposal for funding from the National Endowment for Science and Technology Awards (NESTA), which supported the addition of two programmers and consultant experts from psychology, linguistics and

special educational needs, into the team. The design phase that followed funding focussed on the integration of ideas from the design team, consultants and teachers together with observations of children in free-play activities to arrive at a design concept. The implementation phase required the team to consider the goals of the project very carefully and to develop many of these ideas into a series of prototypes, each version accommodating more design ideas from participants and identifying both the parameters and possibilities of the technologies currently used in schools. Each prototype version was evaluated, using a variety of qualitative and quantitative methods, and the responses carefully analysed before the designs were refined. The final stage of the project has been to identify further possibilities and to invite contributions from a wider audience, deepening collaboration through the use of social media and making software prototypes publicly available on the Reactive Colours open source website, http://www.reactivecolours.org (Stadler & Hirsh, 2002).

4.2 The role of autistic children in the development of the software

The ambition to undertake a participatory design process, whereby those who are most likely to benefit from the outcome are key informants in the most important aspects of development, (Friere, 1974; Druin, 1999), was realised through the commitment of a group of children aged between four and seven years, in full-time attendance at a school for special educational needs with a specific autism support unit, their teachers and teaching assistants.

Over a period of approximately two years, at the suggestion of teachers, these children, in small groups of up to five children aged between four and seven years, at varying stages of cognitive development, were invited to explore prototype ReacTickles on the SmartboardTM. What became clear very early on was that the software needed to exploit the potential richness of bodily movement and to allow for the idiosyncratic, emergent needs of the children as many of them became upset by the sensory overload and potential for failure that is characteristic of many software programmes. Thus movement and perception became the prerequisites for interaction, rather than the need to manage the control of graphical information and ReacTickles were designed with a view to encouraging expressive full body actions. By utilizing velocity, gravity, inertia and elasticity in an advanced form of cause and effect, when the ReacTickles on the surface of the Smartboard™ are touched, a corresponding action is directly prompted on a different part of the screen. User action is expressed through location, direction and dynamics, rather than metaphorical or symbolic representations of objects, which is far more relevant for autistic children as, without the demands on cognitive and fine motor skills, they able to interact in a way that is positive and rewarding (Figure 1).



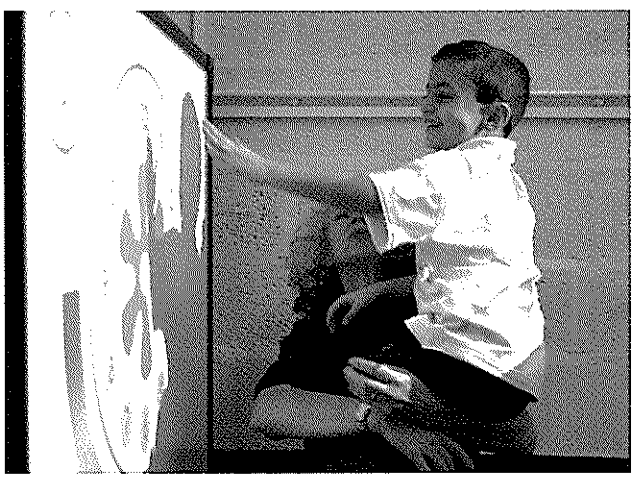
In this socially mediated environment the outward rendering of inner engagement has the potential to invite participation from others, as areas of mutual interest can be readily shared. In this context, embodiment denotes more than a synthesis of control and response, it actually allows for actions to be mirrored in a positive, playful and improvisational manner (Suchman, 1987).

4.3 Findings

What became evident from video analysis of the different groups using ReacTickles on the SmartboardTM was that children were using their physical and perceptual skills in a manner that was natural for them, and that they were able to use expressive forms of communication to demonstrate their interest and to invite the participation of others. Gross motor activities such as stretching, jumping, reaching and smoothing became part of the embodied experience, together with finer motor skills such as circling, tapping and pointing, all of which had a direct relationship to the digital response on the SmartboardTM surface. One child, aged seven years, evidenced a degree of discomfort at the start of the session,

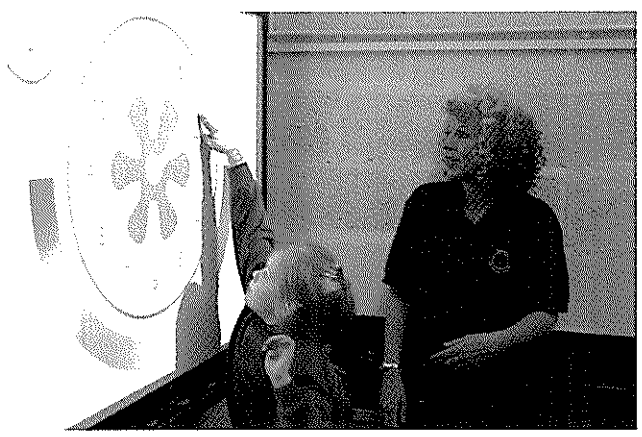
he was observed running backwards and forwards at the Smartboard™, flapping his hands violently, however, following encouragement from his teacher, he began to engage with ReacTickles, and within minutes started smoothing the Smartboard™ and became much calmer and in control of his actions. The child's teachers considered this to be a clear indication of intentionality and purpose.

For some of the children, the position of the Smartboard™ inhibited their ability to follow through their actions, for example, where the ReacTickles shapes ascend to the top of the screen having been released from a static position by the child's interaction, when the child attempted to chase the shape the height of the board meant that the shape moved out of reach. What was notable on these occasions was that children requested assistance using spontaneous language and gesture, and did not show any signs of distress. Although hand to eye co-ordination was generally very good, some children had difficulty gauging the amount of pressure needed to activate the ReacTickles on the SmartboardTM and needed assistance from a member of staff (Figure 2).



Two classes using the software had no verbal language and had difficulties with concentration. Teachers noticed that when these children were playing with ReacTickles at the Smartboard™ the levels of concentration improved, as they were able to see their actions mirrored on the screen; it was also suggested that as the children were able to demonstrate their interest through their physical actions, their expressive communication also improved.

A different group, who were able to use verbal language demonstrated certain characteristics associated with symbolic play, as they attributed properties to actions in an imaginary way. For example, when filled circles ascend and wobble, a child enthusiastically says, "Pop the bubble!" As another child voluntarily joins the activity, instructional vocabulary is shared between the two and the pretence continues. A third child joins the group and extends the play, he imitates the actions of his peers and adds his own variations. In a different type of activity, where written words become the object of play, for example colour names form a wave and leave a trail, children voluntarily verbalised colour names, not simply as a descriptive label, but to draw attention to the action. Comments, such as, "I've made a circle!" clearly suggested that the child was inventing a context for the action and expressing a desire to share the experience with others (Figure 3).



Experts analysing the video footage of the children suggested that as ReacTickles did not rely on understanding the representational significance of the visual elements, children were clearly responding in manner that was meaningful for them, rather than following the predetermined sequence of actions offered in most software programmes.

5. Further research

The spontaneous use of verbalisation, vocalisation and gesture form part of the pattern of activity with ReacTickles. Extensive research has been carried out which examines the gestural responses of children as a method of measuring learning and thinking (Goldin-Meadow, 2003). The results showed that

gestural responses reflected a tacit knowledge which did not need to be expressed through verbal language. In the analysis of young autistic children's responses to ReacTickles, the non-verbal expressions of interest, engagement, and in some cases, anxiety, were used as an indicator of interest in ReacTickles and not to consider the skills of the child.

It was evident that the children directly related their use of language to their actions, (Bruner, 1972; Vgotsky, 1978) in a manner that was spontaneous and improvised (Suchman, 1987). This has far reaching implications for autistic children whose language use is often not directly related to intentionality and purpose, however this will be considered in further research.

6. Conclusion

The Reactive Colours project, through a gradually evolving, participatory design process, has identified the potential that young autistic children have to uncover, explore and develop meaningful play experiences in digital settings.

The small-scale study described it this paper has clearly identified the role of tactile interaction in affording comfortable sensory experiences, and its further potential to bring active playfulness into learning. The ReacTickles interface represents a deliberate move to provide a facility for children to interpret and understand their actions and the actions and intentions of others as it engages the tactile, vestibular and proprioceptive sensory systems to a higher degree than most other software programmes.

The design is not simply about the relevance of supporting sensory and physical skills, but how these skills can contribute to understanding the needs of others. The neutrality of the interface enables children to communicate expressively, using their personal choice of language and gesture in an improvisational manner, as they encounter experiences directly with the ReacTickles software or whilst interacting with others at the Smartboard™. Our study has shown that ReacTickles software can provide a completely embodied play experience as input and output are closely matched. In this way, children are supported in using a range of skills, including physical and perceptual, rather than purely cognitive skills, which can be highly demanding, particularly in social situations. For children whose sensory systems may exclude them from activities that require fine and gross motor skills, the combination of the responsive, non-representational ReacTickles and tangible technologies has the potential to create a positive learning environment in which meaning is created and understood through context and use rather than the necessity to perform a task within a restricted set of physical and graphical boundaries.

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DURABLE DESIGN: AN OPPORTUNITY FOR CONTEMPORARY STUDIO JEWELLERY?

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Abstract

This paper focuses on the discipline of contemporary studio jewellery, and proposes that calls for emotionally durable product design, elicited in response to the growing environmental crisis, present an opportunity for the field of contemporary studio jewellery to expand further.

Contemporary studio jewellery is a discipline with its roots in craft practice, which has been recognised as a profession for approximately 35 years. Practices in this discipline tend to be self-referential, even elitist. In order to continue to grow, the field needs to seek broader social and cultural relevance.

Studio jewellers have adapted a material-centric approach to designing and producing objects, and this is reflected in current responses to global ecological issues. This paper examines these responses, and identifies emotionally durable product design as a possible opportunity for studio jewellery to extend its boundaries to encompass new challenges. These debates may provide a context to which contemporary studio jewellery may apply its inherent creative processes and approaches, and establish a direction for new growth.

Introduction

It is now widely recognised that human activity is the cause of an environmental imbalance which must be rectified, and that reversing this situation requires a significant cultural shift. Ecological and environmental debates, and calls for change to our current unsustainable lifestyles appear frequently in national and international media. Recent press coverage focuses on issues such as travel, transport, energy, recycling, and the purchase of responsibly sourced and manufactured goods. (Pattenden, 2007). These debates are evident in many professional spheres, including design, where it relates to concern about wastefully using up diminishing natural resources, and the impact of waste production on the environment.

This paper considers the work of a selection of contemporary studio jewellers in terms of these concerns. It was stimulated by two events which aimed, in different ways, to explore how design can take responsibility for this apparent environmental imbalance. The first, *Design for Durability*, was a seminar held by the Network on Product Life Spans (Sheffield Hallam University) in April 2006. The second was *Carry The Can*, a conference organised by the Association for Contemporary Jewellery in July 2006.

Design for Durability aimed to 'explore the responsibility of designers for our throwaway society and their potential contribution to sustainable consumption through the development of longer lasting products' (Network on Product Lifespans, 2007). *Carry The Can* focused on 'issues of value/values and responsibility within an ecological, ethical and sustainability framework and the application and relationship to the global contemporary jewellery design and arts' (Association for Contemporary Jewellery, 2007). The conference set out to discuss ethical issues in general, with a focus on ecological and sustainability questions.

Through considering the work of four different jewellers this paper relates the material-centric practice of studio jewellers to product longevity for two purposes. First, it seeks to identify

opportunities to enhance awareness in the field of studio jewellery practice of the potential for it to engage with issues of environmental concern. Although the field has existed in more or less its current form for approximately 35 years, it has tended not to develop a rich self awareness in terms of its relationship with other fields. Second, this paper explores the potential for the customary practices of studio jewellers to help in developing strategies for sustainable approaches to materials, processes and human/ object relationships in the field of design more generally.

The paper identifies practices in studio jewellery as being fundamentally material-centric. Although strongly influenced by the conceptual strand in art practice studio jewellery remains concerned with specialist materials and processes. Design and making is approached on two levels; on one hand practitioners take a creative and knowledgeable approach to handling material, and on the other hand they often employ an analytical approach, challenging everyday understandings of jewellery and domestic objects. This paper proposes that if such an approach is applied to the issues sketched out above, it may help to produce objects that are environmentally sustainable, in terms of appropriate material application, provoking change in consumer behaviour, or producing objects with genuine longevity. The field of Studio Jewellery could therefore contribute to the development of new design genres, whilst finding broader applications for its inherent approaches to design.

Durable Design

There is a need for the development of new and sustainable approaches to design. Tim Cooper (2005) discusses the link between consumption and the over-production of waste in contemporary industrialised society. He identifies the need for the development of 'life-cycle thinking'. He states that 'Life-cycle thinking is of considerable importance to designers, manufacturers, and consumers in responding to the challenge of sustainable consumption.' (2005: 64) Current approaches to design both fulfill and stimulate a continuous demand for new possessions, and therefore stimulate the production of waste. If this is to be tackled, a cultural and economic shift is required. According to Cooper, the achievement of sustainable consumption;

> ...implies a reduction in the throughput of resources. This requires a shift from a linear to a circular economy so that inputs of virgin raw material and energy and outputs in the form of waste requiring disposal decline (2005: 52).

Design for Durability sought to explore the possible contribution of designers to instigating this shift through the design of longer lasting products. In this, it built on previous events with similar aims, such as the conference organised in 1997 by the *Eternally Yours Foundation* based in the Netherlands; *Eternally Yours – Visions in Product Endurance*. This conference discussed the 'field of product lifetime extension' (Eternally Yours, 2007). Notions of prolonged user engagement as a route to creating durable design have since been discussed in terms such as 'longevity', 'durability', 'lasting value', 'enduring attachment', 'emotional durability' or 'product lifetime extension'. The notion of prolonged user engagement is seen as a route to creating sustainable patterns of consumption. The cases of contemporary studio jewellery design discussed below suggest that the right objects made of appropriate materials could make possible longer lasting relationships between consumers and their possessions.

Contemporary Studio Jewellery Design as a Discipline

Jewellery design in its broadest sense is defined by Jivan Astfalck (2005) as 'multifaceted' and operating on 'many levels of commerce, art and design'. Studio jewellery constitutes an extremely small proportion of overall jewellery production. Studio jewellery design can be understood as a specialist discipline rooted within applied art or craft, with a 'specific and characteristic' language of its own. (den Besten, 2005). Also seen as 'author' jewellery (Evans, 2006), work is usually valued for the personal artistic statement of the maker.

The political and cultural reawakening of the 1960s and 1970s saw practitioners in both Western Europe and North America questioning and challenging the perceived boundaries, traditions and conventions of jewellery design and making. In recounting the 1960 to 1980 period, British jeweller Caroline Broadhead (1985) stated that '...the prevailing European tradition of technically precise but aesthetically static jewellery has been firmly rejected by many designers.

...a bold attempt has been made to establish an interest in jewellery independent of its associations with wealth, status or fashion.' Out of this idealistic and prolific 'Golden Age' (Derrez, 2005), contemporary studio jewellery has developed as an art form, and an autonomous discipline. What we have now is a 'Worldwide and specialised infrastructure', with its own 'training programmes and galleries, museum collections and collectors, books, and catalogues.'(Derrez, 2005). Specialist departments in educational institutions, particularly art colleges, have developed as hubs of knowledge and creative development.

The values and processes inherent to contemporary studio jewellery are embedded in making, material and (sometimes) technique, while creative and conceptual processes are informed by some of the assumptions about the autonomy of individual creative practice that are to be found in fine art practice. For this reason perhaps, Studio jewellery has a tendency to be self-referential as well as being recognised as a productive craft discipline. Contemporary practitioners typically work alone (often self employed) with discipline and independence. They do not usually design for a specific market demand. Rather, they will be informed about markets, and will often take initiatives to generate demand. The discipline encompasses many approaches from technique-led 'production craft', (Metcalf, 2005), to conceptual approaches more akin to art practice.

The growth of the field and its specialised infrastructure is to an extent self sustaining. The field is introspective; practitioners reflect heavily on existing practice and it is sometimes difficult to identify the discipline's wider social and cultural relevance beyond its own infrastructure. In order to achieve broader social and cultural relevance and to fully explore possibilities for further growth, it would benefit the discipline if practitioners and institutions reflected on the opportunities and applications that the unique character of their discipline makes possible.

Material-centric Approach

The discipline of contemporary studio jewellery is small, and any impact it can have on global ecological problems, whether positive or negative, is negligible. It is natural, however, in the current cultural / social climate that some consideration of environmental issues should be reflected through ethically considered studio practice, or made manifest through objects produced. The response to environmental issues within studio jewellery design to date is typically restricted to consideration of material use. This manifests itself in two ways.

Firstly, the environmental impact of sourcing materials traditional to the discipline is a subject of concern to practitioners. Historically and traditionally jewellery has been made from precious metals and precious stones. A number of campaigns and debates have developed around the sourcing of mined materials perceived to be precious, which touch on issues such as human rights, local environmental and ecological damage, and worker exploitation in the developing world.

One such example is recently formed (2004) USA based *Ethical Metalsmiths*, who were represented at *Carry the Can*. Their aim is to raise awareness amongst metal artists of the ecological impacts of mining processes, which are the starting point of the materials intrinsic to the discipline. The *Ethical Metalsmiths* website draws particular attention to the impact of open pit mines, which can 'consume excessive amounts of water and energy... consume wilderness areas, threaten economies and indigenous communities, and can cause perpetual pollution'(2006). They urge their colleagues (in the Western hemisphere) to consciously consider their responsibility in their purchase of material for this wide-ranging ecological damage: 'We are intimate with gold, but overlook the fact that the jewellery we make begins with, and at, the source of our materials... we must take notice and share responsibility. (Ethical Metalsmiths, 2006).

Secondly, conscious attempts at sustainable designing and making within studio jewellery focus frequently on the reuse and recycling of objects and materials. This can be seen simply as sustainable material use, or as an attempt at creating narrative, perhaps provoking a 'green' conscience in the audience. Many studio jewellers have achieved recognition for their re-use of obsolete or discarded materials and objects. This work is often attributed with value as sustainable design by critics and curators, for example through craft exhibitions such as *Recycle*, hosted by Craftspace touring in 1996, and *Reclaimed*, hosted by the Design Council 1999-2003. However, the use of re-appropriated materials is not always a conscious effort to produce sustainable design. It is perhaps more common to find studio jewellers who seek to challenge preconceptions

about material use in jewellery by giving value to 'non-precious' or waste materials. For example, Brigitte Turba has gained recognition for her use of recycled plastic bottles in her jewellery. Her work has been interpreted as a response to environmental issues in two exhibitions: *Recycle* and *Reclaimed*. She writes;

> I take a material not seen as precious and give it a new value to show that it can be beautiful and challenge people's expectations... Use of waste is a particular challenge in jewellery making where precious materials dominate (Turba, 2007).

The two approaches outlined above emphasise material use almost exclusively in their response to the need for sustainable practices, which can be explained by the fundamentally material-centric nature of studio jewellery design. The processes of design and production are usually embedded in the manipulation of material through hand making. Given the nature of the discipline, it is inevitable that the reaction to environmental concerns is self-reflective, and therefore questions the sourcing, production and use of materials specific to this area.

However, these examples can also be seen within a wider cultural framework as a reflection of a symptom-focused approach to solving the ecological crisis. There is a burgeoning culture of recycling materials and objects in contemporary Western societies, despite the fact that, recycling could be seen as a reactive and superficial approach to finding a solution. The over-production of objects, and waste, is stimulated by high levels of consumption, resulting in short life-spans for many products. The vast majority of these products, once obsolete, end their lives in land-fill sites. Jonathan Chapman argues that design itself has embraced this symptomatic approach to the ecological crisis;

> Amidst the frantic scramble to comply with growing legislative demands, the root causes of the ecological crisis that we face are frequently overlooked. Meanwhile, consumers continue wastefully on, but do so, now, with recycled materials instead of virgin ones (2005: 9).

Chapman makes an impassioned call to tackle the problem at its roots, through new ways of designing and thinking about objects. This requires a movement away from the 'cosmetic approaches' of mainstream, techno-centric product design. Chapman suggests that 'alternative genres' of designing could provide consumers with 'rich and varied experience.' (Chapman, 2005).

This paper suggests that beyond the conscious responses outlined above, there are practices indigenous to the material-centric approach of contemporary studio jewellery that could lend themselves to a new, sustainable genre of design. These are illustrated through the case studies below.

Case Studies

Manon van Kouswijk (NL)
Through her practice as a jeweller and applied artist, Manon van Kouswijk explores domestic objects, in particular the jewellery and tableware most familiar to us. This exploration is carried out through the process of making; thinking is visualised through physical experimentation. 'The making process I view as an act of translating and of making visible aspects of the everyday life of things' (Van Kouswijk, 2006).

The result of this open-ended experimental process can be either a series of art objects, and or a functional object. The art objects could be interpreted almost as a series of thoughts, manipulations of recognisable domestic language. The functional objects retain elements of exploration of domestic ritual, yet are useful and usable objects; functional but provocative. For example in a napkin designed by van Kouswijk, marks left in the course of the life of the napkin are embellished with embroidery, acknowledging wear and use.

Laura Potter (UK)
Through her practice as a jeweller, Laura Potter analyses the role and function of jewellery as a possession. Items of jewellery number amongst the most precious of a person's possessions, and are liberally invested with emotion, sentiment and superstition. Potter's work is observational in nature. For example, she draws attention, through the objects she creates, to the private places people chose to store or hide their jewellery. *Safesock* (2005) focuses attention on the tendency to keep jewellery hidden in the bottom of a bedroom drawer where it is felt it will be safe.

Potter's (as yet unfinished) project *My Life in a Sock Drawer* investigates the unique way in which jewellery is treasured and sentimentalized, even accumulated, but yet not worn. The project concentrates on women who look at jewellery as 'a means by which they can access and evidence their life experiences' (Potter, 2007).

'Jewellery items are amongst our most precious possessions, not only in material and aesthetic terms, but because they are key artifacts through which we establish a sense of self' (Potter, 2007).

Kaz Robertson (UK)
Kaz Robertson does not claim any conceptual or intellectual rationale. She is typical of a number of studio jewellers operating as 'production' craftspeople (Metcalf). Her work is produced to sell through contemporary craft outlets, it is not intended to provoke debate or enquiry. In an interview on her practice and approach in 2002 Robertson makes reference to the pleasure of making, the visual and tactile properties of polyester resin, and visual inspiration - 'the bright colours and patterns of sea life'.

Her work revolves around one material (polyester resin), the physical and visual characteristics of which she has an exceptional understanding. By specialising in one material, she has invented ways of manipulating it which are both unique and personal. The material forms both an inspiration and the means of production. As a result, Robertson handles this material in a very sensitive and creative way.

Ted Noten (NL)
Chew Your Own Brooch is a project by jewellery designer Ted Noten started in 1998 at the Museum Boijmans van Beuningen in Rotterdam. Members of the public had the opportunity to buy a piece of chewing gum, with a return box. They were invited to chew their own form from the chewing gum, and send it back to the designer. Some of these forms were then selected and cast in gold or silver, transformed into a pin or brooch, and sent back to the sender of the gum.

This work challenges notions of precious jewellery through an interesting and provocative juxtaposition of material opposites. The process encouraged participants to actively consider a particular ubiquitous and throw-away object (chewing gum), and its associated ritual (chewing and disposing). The chewing gum littering the streets of Europe was 'reconfigured and re-introduced as a precious piece of body adornment, thus rearranging the everyday order of things' (Astfalck 2005).

Practices Integral to Studio Jewellery

The above examples illustrate a variety of different approaches to practice within the field. All four have trained in specialist art and design institutions. but they do not conform to one model, however they do make it possible to identify practices that are characteristic of this discipline.

Practitioners and students explore and understand their discipline through study, education and publications. This is usually focussed on the objects produced. However, we could instead look at studio jewellery as an *approach* to designing objects, and hence at the way this approach could be adapted to new contexts. This material-centric approach to designing objects cannot necessarily be transferred directly to the context of durable product design. Contemporary studio jewellers operate with a certain freedom; they do not usually design within the constraints of a commercial brief, or for production on a large scale. Therefore the examples discussed here do not comprise a solution, but imply that through further analysis, and through the development of new opportunities and platforms, certain aspects of this approach may contribute to a new and sustainable form of design. These aspects can be summarised as:

Experimental Making: Ideas are often developed through material experimentation, intuitive or investigative in nature. Thinking is visualized through making, in an open-ended way, usually without the restraints of a commercial brief. This creative making process can produce objects which are ambiguous and thought provoking in their subtle manipulation of recognisable domestic language.

Sensitivity in Handling Material: Jewellers frequently demonstrate great quality in the manufacture of objects, and ability to handle specific materials sensitively and innovatively. Makers know the physical properties of their materials well, know how to best handle them, and often develop unique ways

of doing so. There are several implications for the durability of products: A product should be more attractive and last longer, if it is made well, and the material is considerately chosen. A hands-on knowledge of specific materials could contribute to the use of materials appropriate to the lifespan of a product. Could there be hands-on specialists in degradable materials?

Challenging the User's / Viewer's Perceptions of Material: Frequent exploration and questioning of materials traditional to jewellery, and of peoples' associations with those materials, amounts to intelligent and provocative material use. *Chew Your Own Brooch* employs a socially engaged approach that is relevant to the development of durable design. The material juxtaposition and design process provokes cognitive enquiry, creating a narrative that is individual to the owner of the brooch, thereby strengthening the user-object relationship. Noten has relinquished creative and aesthetic control, and given a creative opportunity to the participants. In addition, the project draws attention to chewing gum as a disposable object.

Analysing the symbolic and social functions of jewellery: Practitioners consciously seek to understand the symbolic and social functions of jewellery, and the way in which it can embody memory, emotion, or superstition. Laura Potter is typical of a number of jewellers with intimate knowledge of jewellery and domestic objects and the way in which owners form attachment. She brings domestic rituals to our attention; how we buy, wear, store and accumulate jewellery.

Jewellery is a unique type of object, ubiquitous in most parts of the world, which is generally intrinsically emotionally durable on more than one level. It is arguably fundamental to human culture, and persists over generations to inform us about previous cultures, or about our own family histories and identities (in the case of jewellery as heirloom). Clare Phillips (1997) states that;

> The wearing of jewelry has been a constant feature in mankind's existence from earliest times. Amongst scattered cultural groups the same desire for ornamentation is evident... Our knowledge of ancient jewelry depends almost entirely on pieces that were either buried with the dead or hidden during times of war (1997: 7).

The perceived precious nature of the materials traditionally used further ensures that jewellery (as a possession) is regarded in a special light. The history and collective cultural knowledge of jewellery forms a source of debate and inspiration for many contemporary Studio jewellers. Jewellers often have an intimate and specialist understanding of this object, and seek to challenge and explore existing forms and materials.

Stuart Walker (2006) argues that seeking to understand existing objects with durable characteristics will help to advance thinking about the creation of sustainable product design;

> When objects have been produced over such long periods of time, spanning diverse cultures, languages, and understandings, then we can be sure that there are lessons to be learned from them about our relationships with material things, and our contemporary efforts to tackle sustainable issues in product design and manufacturing (2006: 20).

Contemporary studio jewellery constitutes a body of collective knowledge which if tapped into, could surely be of value to the design of new, durable objects.

Conclusion

The discipline of jewellery design is self-reflective and autonomous in nature. The risk in operating as a highly specialised and introspective field is that the wider social relevance becomes questionable. However, new directions can develop if jewellers look beyond the current boundaries of their discipline to embrace external opportunities.

New approaches to design need to be developed in response to current environmental concerns. The notion of prolonged user engagement is seen as a route to creating sustainable patterns of consumption. The right objects in responsibly chosen materials could persuade or provoke a longer lasting relationship between consumers and their possessions.

Through discussing the work of four contemporary studio jewellers, this paper has attempted to identify practices integral to contemporary studio jewellery, which may lend

themselves to the creation of durable and sustainable objects. The paper does not propose a solution, but suggests that through further analysis, and through the development of new opportunities and platforms, certain aspects of this approach may help inform, or be applied to a new and sustainable form of design. Many contemporary studio jewellers have developed an analytical understanding of the domestic object, and a creative and knowledgeable approach to handling material. Furthermore, studio jewellers are concerned with a unique genre of object, which is generally intrinsically emotionally durable. These inherent practices could help to assist and progress the production of objects which are considered either in terms of appropriate material application, in terms of provoking change in consumer behaviour, or in terms of producing objects with genuine longevity. This new perspective on the field could constitute the first steps towards a new and socially engaged direction.

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DRESS AGAINST DISASTER: CLOTHING AS HYPER-MEDIUM IN RISK SOCIETY

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Abstract

Apart from natural disasters, the perceived risks and dangers in modern society create an ambiguous, uncertain and anxious social structure. As a driver of modernity, the production and communication of fashion has become conceptual, critical and at the cutting edge, rather than an appearence–oriented attitude. Hence, clothing has become a means of discourse for fashion through the forward looking, deconstructive, multi-functional and multi-disciplinary language of design as a response to social disorder and the disasters related to the problems of modern society. Thus, clothing has been redefined as a protective shelter, a mobile structure, an interactive and technological hyper–medium in between the territories of space, object and the human body in order to fulfill the needs and expediencies of modern individual in the urban metropolis.

This paper adresses a new dimension of fashion and clothing which challenges the role of clothing as a physical extension of the human body and an aesthetic display of social identity. By using the clothing as a means of re-structuring and re-constructing the human body, the wearer adapts to the reflexive conditions of modern society, thus empowering the individual against the deal with the real or perceived risks and disasters of the urban environment.

Introduction

> "The world in which we live today is a fraught and dangerous one" (Giddens 1990: 10).

Modernity provides us the possibility of choice through social and individual progress, in a way we can break our bonds from the past and tradition. On the other hand, with its expanding complex structures, it has also created the idea of risk and reflexive conditions due to its unpredictable roots and uncertainties. The creative self-destruction of 'risk society' (Beck 1992) has been a sign of radical modernity in a society increasingly preoccupied with the future (and also with safety), constantly manufacturing and managing the risks.[1] The concepts of risk and contingency being dominant characters of modernity, create the consequences of a fragile relation between trust and danger, thus making people more insecure and inner-directed.

The aim of this paper is to redefine the role and meaning of clothing and dress in a risk society through a radical and critical attitude towards fashion and clothing. Clothing functions not only as a multi-functional physical garment againts the dangers of the urban realm, but also as a social response and reaction against the anxiety and insecurity engendered by the real and perceived risks of modernity. Bolton refers how 'perceived' dangers and everyday risks in urban environment such as to be run over, mugged, sexually assaulted, shot by gang members, or having our throats slit by a sociopath, can create a natural anxiety and paranoia towards a 'fantasized dangerous character such as the 'urban other', as a potential criminal (2002: B1).

[1] The risks of the modern society like the possibility of nuclear war, ecological calamity, uncontainable population explosion, the collapse of global economic exchange, global industrial pollution, contamination of air, water, food, sickness, death of plants, animals and other people are potential catastrophes provide an unnerving horizon of dangers for everyone (Giddens1990:125).

The ontological problems of radical modernity, such as homelessness, exclusion, confinement, alienation, social decay, opression, disruption, complexity, fragmentation and trauma also change the glamourous face of fashion and influence the mode of clothing into a de-constructive complex structure, which can be defined between body, space and the object to be re-semantified within the context of risk society.

The response of fashion against social disorder

Fashion responds to the conditions of radical modernity in three different ways:

1. As Benjamin points out with the metaphor of 'Fashion is the tiger's leap to the past', flashbacks and retro interpretations from the past are the main drivers of fashion in the modernity, Ewans puts it as 'an oscillation between novelty and decay' as a result of the cultural trauma, through a century marked by world war, totalitarianism, terrorism and environmental crisis, whereas Chambers mentions about a continual return to events as re-telling, re-citing, re-siting, recalling and remembering of earlier fragments and traces of 'moments of dangers' (Ewans 2003:37). In contemporary fashion, by the 70s, fashion used its memory more intelligently by re-introducing old styles through recyling and retro interpretations.

2.*The street* has become a home for the homeless and disenfranchised, being a transitional environment, especially with the ground-breaking urban movement of modernism, Punk, and another dressed down movement, Grunge. Punks developed a more nihilist attitude, with no reference to the past. The hidden meaning of the style, as Dick Hebdidge (1979) argued, is constructed by the technique of bricolage.[2] Grunge, on the other hand has become the style of the urban bohemian and unemployed, 'the fashion-damage control exercise' as Mc Dowell puts it (2000:483), 'a self-mocking, beer and heroin–inspired reflection of the hopelessness of being young, homeless and uncool, reflecting a cultural mood of anarchy at the at the centre of the new art world.

3. A forward looking design movement called deconstruction has become the new promising cultural reaction in building a new society, new identities, and new aesthetics and values. Ewans, refers to Richard Martin and Harold Koda to define 'deconstruction' or 'la mode Destroy' as 'a mode of thought current to our times' (Ewans 2003:250). By the mid 80s, the movement had fostered in fashion, by a group of designers from Royal Academy of Fine Art in Antwerp.[3] They followed a philosophical project of deconstruction, and introduced a conceptual and radical attitude to fashion, rethinking the formal logic of dress itself through unconventional cutting and aesthetics. By the 90s the movement referred to a trend towards hidden hemlines and seams deliberately turned to exterior of the garments, their imperfections polished and arranged as ornamentation (Pantellini and Stohler: 2004:171). Japanese designers contributed to this movement by their unconventional aesthetics and a spiritual attitude departing from their culture.[4] Barbara Vinken (2005:35) addresses this transformation as the era of post-fashion or after-image fashion. She says 'If, for a hundred years, fashion has invented and re-invented woman, post-fashion has begun to deconstruct the woman'.

The post-fashion era has revealed the hidden dimension of fashion, as Lippovetsky (1994:241) puts it, confronting the euphoria of fashion with its counter parts in dereliction, depression, and existential anguish. According to Arnold (2001:xiii) 'the excess and glamorous face of fashion has counterbalanced with a disquieting feeling of anxiety, ambiguity, threat and anxiety'. She refers to gothic images of dark fetishes, whereas Ewans (2003) mentions about fashion

[2] Using the repertoire of these signs speaking a hybrid language bringing together the most unremarkable and inappropriate items such as a safety pin, plastic clothes peg, cheap trashy fabric, nasty colors besides black, cut of socks, bondages, chains, straps television component, a razor blade, a tampon, bricoleur constitutes a symbolic ensemble to replace commodities which served to subvert their original meanings with an anarchic discourse to convey a different message.

[3] Ann Demeusemester, Walter Van Beirendonck, Martin Margiela , Dries Van Noten, Dirk Birkembergs.

[4] Rei Kawakubo, redefined the body with an extended sculptural volume with a garment interacting with the movement and space (deformed the body through the garment almost recalling of humpback of Notre Dame) breaking the conventional aesthetics of fashion related to perfect body proportions or a perfect image (Pantellini and Stohler: ibid)..

images as form of catharsis or mourning or imagery of disaster to justify this; 'False optimism and the shiny gloss of fashion, do not really draw the real picture of a modern world, that can be defined by abjection, alineation and decay' (ibid:308). Recalling the imagery of disaster as Warhol's in the 60s related to car crashes, criminals and electrical chairs, apocalyptic visions became popular in contemporary fashion photography by the 70s. Paradoxically, in these projections of the dark side of urban environment in a half documentary style, the fashion model is generally disconnected from the environment.



Figure 1. (Left) Photograph by Peter Lindberg, Italian Vogue,199 (Ewans 2003:193)
Figure 2. (Right) Andy Warhol's Saturday Disaster, 1964 (ibid)

Clothing as an outsider of the fashion system

The new understanding of fashion not only converts the class and gender stereotypes of the modern society, but also the medium of clothing by breaking the boundries between body, space and object. Therefore, fashion rebuilds its architecture by re-creating social structures to overcome the problems of the modern world through clothing by avantgarde designers such as Hussein Caglayan, Arkadius, Junya Watanebe, Commes des Garcons, Mischiko Koshino, Alexander Mc Queen, Viktor & Rolf and Yeohlee.

Dress, then is no longer an aesthetical artifice to beautify the individual, nor a mere functional protective shield, but a *hyper-medium* which incorporates functionality to contemporary aesthetics, creating a social response which acts as a personal environment, a portable environment, an interactive space and a technological medium.

Bolton (2002:7) employs the term 'Supermodern Wardrobe' to identify clothing which responds to the problems created by the urban metropolis by conceiving practical and functional clothing. Borrowing the term *supermodern* from the antropologist Marc Auge, Bolton refers to the individual as one who has to flow among the growth and accelerated circulation of urban populations, and to respond to the physical and psychological demands of transitional spaces such as roads, railways, airports, and the street.[5]

The 'supermodern clothing' responds to the conditions of urban environment by facilitating bodily movement; providing shelter against inclemencies of the weather as well as against noise and pollution from traffic; affording physical protection against street crime and physchological protection against both the gaze of passers by and neutered gaze of the surveillance camera (ibid).

Social disorder and the body

Like the home, the body is the ultimate device that the modern individual uses to overcome risks, providing a protective, safe territory that belongs to the self. Being a unique protective environment, the body functions as a cocoon, a unique shelter and a refuge which turns into a space/place when it is impossible to be at home. Insecurity and disbelief in the social system and to other individuals in urban life, makes individuals empower themselves through their bodies.

The body is also the most fundamental mechanism of motion. Thus, the body functions as a mobile shelter in the modern metropolitan environment. Mobile living creates a sense of continous nomadic experience. People in motion, carry their clothing with their body, along with mobile communication devices, the new identity cards. Because the natural body remains fragile and vulnerable to the dangers and risks of the urban environment, urbanites need to empower themselves through protective, multi-functional clothing that will reflect their social identity. The modern person's habitation is the

[5] Auge(1995) uses the concept of 'supermodenity' to express the logic of excessive information and excessive space, that he calls 'non-space' through which we are transit for most of our time, as ever-increasing proportion of our lives mostly spent in supermarkets, airports, hotels, motorways or in front of our TVs, computers and cash machines.

body which is technologically dressed up. A new aesthetically driven dynamic of multi-functionality has been sought by fashion designers as well as architects' (Queen 2003:96).

Protection against disaster

Apart from the basic motivation of clothing in the account of protection against physical and psychological dangers of the general environment, the role of clothing as the protective shelter against the real and perceived risks and dangers of the modern society is evident. In that respect Flugel's caution of the need of 'protection against the general unfriendliness of the world as a whole' or as 'a reassurance against the lack of love', which can be considered as a restatement of the risks and disasters of urban environment in which urban clothing becomes a protective shelter'. If we are in unfriendly surrounding, whether human or natural, we tend, as it were, to button up, to draw our garments closely around us'. He further links this function to 'womb fantasies', fantasies of returning to the 'warm, enveloping and protecting home where we spent the first nine months of existence' (Flugel 1930:77 in Carter 2003:106).

Dress as shelter

Clothing as an extension of the body functions as a protective shelter with the ability to cover and accomodate the body. This makes clothing work with same principles as architecture, except that it is portable, unlike a building. Clothing provides the individual with a portable environment, hence shelter against natural conditions as well as the artificially controlled conditions of public spaces, transitional places and streets.

Regarding social concerns and problems of the urban environment, protective clothing goes beyond the limits of a dress. Conceptual artist, Lucy Orta, creates *wearable shelters* made to be worn in the form of garment-cum-shelters, adressing disaster victims, political refugees, the elderly, the invisible poor, socially unfranchised and homeless people. Her structures become places for seclusion, comfort and hope as vehicles for survival. Sensing the individual's need to define an area of personal space within the urban matrix, she provides a space through her structures where the individual can seek solace as well as shelter.[6]

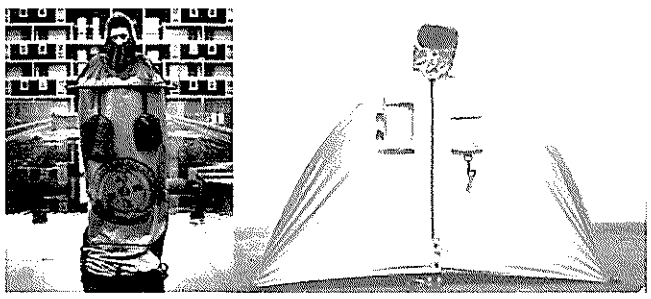


Figure 3. (Left) Mobile Survival Sac from Refuge Wear,1992 (Bolton 2002).
Figure 4. (Right) Woven Habitation by Lucy Orta (Quinn 2003).

Rather than proposing a solution through her social structures between art, fashion and architecture, Orta aims to provoke a social reaction. On the other hand, she conceives each piece as a prototype of a temporary and immediate clothing designed with the potential to be produced industrially in crisis situations such as catastrophes, urban emergencies and natural disasters. Orta's designs have several skins as layers which are similar to different layers of clothing. Virilio expresses transformation of these layers as 'the overcoat there is the sleeping bag, that after the sleeping bag comes the tent... Clothes emancipate themselves, expand to try to become a house, a pneumatic raft' (Virilio 1996 in Bolton 2002: 71).

Dress as a personal environment

In his journey of re-semantification of garments, Hussein Chalayan creates object–clothes. Being a designer of thought, Chalayan transfers a variety of techniques, knowledge of different industries, material and design methods from different areas to fashion. He conceives clothes as a means of communication of a human with his/her environment, as well as extensions of the body, providing the possibility of creating one's personal environment. Through transformation and morphing, he creates the structures addressing in-betweenness, and symbiosis. For

[6] She concieved *Refuge Wear* (1992) as a response to Gulf War to propose a range of multi-functional clothes that transformed according to individual's immediate needs, including 'Mobile Survival Sacs', in which garments are made from microporous polyester that transformed into sleeping bags (Figures 3,4).

Caglayan, the epicentre of creating a collection is the idea. Around that idea he constructs the story of a negative, catastrophic situation. Like Orta, he takes this situation in a philosophical and poetical level, rather than creating a physical solution. Characters of his stories overcome this situation, by establishing a vital connection with the world outside through the clothes or object-clothes they wear (Kipoz and Güner 2006).[7]

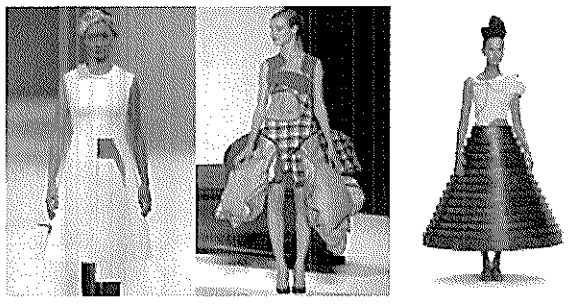


Figure 5. Aeroplane dress, Lifejacketskirt, coffee table skirt, Object-clothes of Hussein Caglayan (Caglayan 2005).

On a more physical level, designers provide shelter against the elements, particular climatic conditions in metropolitan centres to allow the skin to breathe, the designers employ temperature regulation materials in their garments, like Philips proposed in conjunction with Levi's.[8]

[7] His aeroplane dress made of fibreglass, while providing a shelter for the wearer with far more protective material than fabric, referring to man-machine systems has been operated electronically, just like the flaps of aeroplane wings. In his Kinship Journeys (A/W 2003) collection, the infloatable skirts ,with the mechanism of lifejackets are concieved to be protective shelters in case of a possible flood. The similar kind of transformation can be seen in Afterwords(A/W 2000) collection, in which he is inspired from Kosovo war and imagined a portable living room which some pieces can be transformed in to garments in case of refugees has to leave their houses with minumum possessions. Packing action of the room is presented as a performance of morphing and dressing up. Gradually chair covers are transformed into garments, chairs transformed into baggages and finally the coffee table transformed into a skirt (Figure5).

[8] Phase Change Material developed by Philips-Levi's has an ability to provide an adjustable micro-climate for the wearer's body, keeping him/her warm in winter and cool in summer.

Vexed Generation adresses concerns like air pollution, related to social health (Bolton 2002:62). Realizing that air pollution affects our health, and goverment are doing very little about the problem, they decided to design clothes that will help counteract the negative effects of air pollution in the city.[9] In a similar manner CP Company, produces clothes to counteract the negative environmental conditions of transitional spaces (ibid: 65-66). Some of the practical and functional garments providing a shelter rely on formal qualities of architecture, and their forms can often appear more like buildings than clothes.[10]



Figure 6. (Left) *Vexed Parka* with ballistics nylon 1996, Vexed Generation (Bolton 2002).
Figure 7. (Middle) *Metropolis Jacket* with detachable anti-smog mask ,1998 *Urban Protection* (ibid).
Figure 8. (Right) Infloatable jacket from 2001, *Transformables* by CP Company (Quinn 2003).

[9] In the Urban Protection range (A/W 1998) the Metropolis Jacket is designed to protect against air pollution, including an anti-smog mask that is fitted in to a detachable hood. Vexed Parka was such an outfit, which the upper part of the left hand sleeve reveals a pocket designed specifically to contain an anti-pollution face mask (Figures 6,7).

[10] Heavily influenced from the work of Orta, CP Company in their S/S 2000 Transformables range, produced a parka that transformed in to a sleeping bag. In the same collection they took the idea of a portable environment further, by re-creating the physical structure of a building with a long hooded cloak transforming into a metropolitan igloo tent. The year after they produce a bright blue polyurethane parka that transformed into tent with an air matress (ibid: 67) (Figure 9).

Dress as a cocoon

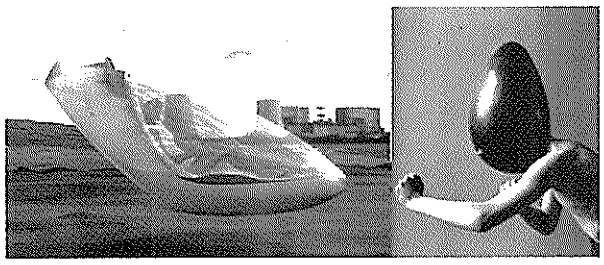
Cocooning being the social attitude of our time, 'is about wrapping ourselves up to protect against the threats we perceive around us – from mobile phones, paedophiles, smog, computers and pylons, to mugging, rape and beggars' (Bolton 2002:84). For Senneth it is about being more inner-directed rather than outer-directed; and for Auge *cocooning* is the paradoxical character to the social experience of non-place as Western fashion of retreating into the self (1995:119). *Cocooning* appeared as a condition of individualism, and paradoxically as a reaction to the social intensity of the metropolitan environment.

Thus, designers concerned with providing a safe and protective environment through clothing propose individual, refuge wear as Orta does, where they can be free from the fear of the perceived dangers of the urban environment. One common design strategy for this is concealing the identity of the wearer through a big hood or high collar. For instance Vexed Generation create 'garments with high necklines that can be worn over the half of the face to conceal the identity of a person wearing them, because of the concerns over the prevalent use of video surveillance' (Smith,Topham 2005:1:50). *Surveillance in transitional space* is another particular problem in the urban metropolis, that the concerned designers attempt to provide a protection against it.



Figure 9. (Left) A4 Coat from Crusader Collection of Vexed Gen.,1999 (Bolton2002).
Figure 10. (Middle) Ninja Fleece, Vexed gen.,1996 (ibid).
Figure 11. (Right) You Must Create (YMC), detachable hood 2000 (ibid).

On a conceptual level, Hussein Caglayan questions the concepts of individuality and surveillance through protective structures. His creation, a small futuristic capsule for travelling, a pod in between body, space and the object as a portable environment, was the expression of that.[11] Designer Jeannie Pineus, created an extreme response to surveillance in the urban environment through the idea of containing rather than wearing, hence Pod.[12]



Figures12,13. Caglayan's travelling pod as a personal mobile space and wooden head (Caglayan 2005).



Figures14,15: Jeannie Pineus head cocoon and cocoon-chair, 2000 (Bolton 2002).

[11] Through one of his films 'Place to Passage' (2003) a small futuristic capsule or pod travelling from London to Istanbul provides a mobile shelter for the passenger equipped with all minumum requirements to live in the pod. In Between (S/S 1998) collection, Caglayan concealed the faces of the models with egg shaped capsules on their heads, depriving them all of their individuality and providing a certain protection. Inside the models remained hidden from the gaze of others, where they can watch the others freely (Caglayan 2005) (Figures 12,13).

[12] Swedish designer Jannie Pineus developed 'Head-cocoon'(2000) to provide a simple way to protect individuals with a personal refuge to hide from the gaze of camera and passers by, whereas with 'Cocoon –chair' provided a space to read, relax and fall asleep (Bolton 2002: 87) (Figures 14,15).

Dress as an urban armour

In response to insecurity and paranoia, not only against the possible dangers and attacks caused by the *other* in the street, but also against the competitive business environment, urbanites need to empower and gain strength. Like buildings that are protected with security fences, with a fortress-mentality, the human body compensates for its fragileness with protective garments. The first armour suit in contemporary fashion was designed by Paco Rabanne in 1960s, which made of metalic chains reminiscent of medieval age armour.

The military garment was the first inspiration for the look of urban armour. Thus, urban outfit designers are inspired from the developments in recent technology in development of fabrics and trimmings. Performance fabrics and clever detailing allow the possibility of making a more effective and flexible clothing for bodily defence. In the footsteps of Paco Rabanne, the Dutch company, Freedom of Creation (FOC) has pionereed 3D print in design through the creation of smart textiles[13] (Smith, Topham 2005: 6).

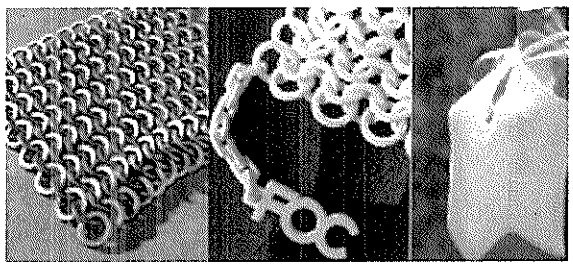


Figure16. Freedom of Creation: 3 printed steel, nylon chainmail and dress (Lee2005).

Conceptual fashion designers employ outfits and accessories to create the image of *armour*, mostly reflected into 'reifications of the *body-machine–image complex*' as Ewans refers (2003: 237). For example, Alexander Mc Queen's fashioned body armour, paradoxically represents the scenes of agitation, horror, abjection and disgust and sadism, through a surrealist attraction and fascination in which defiance comes from robustness of the form and symbols attributed to the garment such as sharpened and angular metallic extensions of the body. (2005: 240-41)[14]

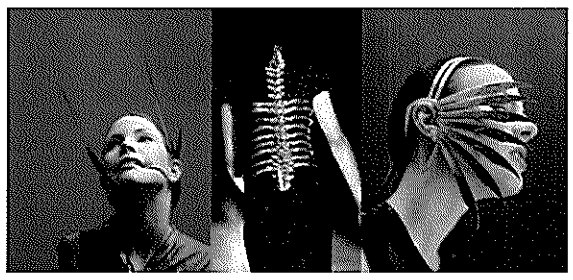


Figure 17. Alexander Mc Queen's defensive armour look (Ewans2003).

By *remembering the things past*[15] designers often employ, re-interpret and re-semantify the protective and constructive corset as an outerwear. The robust structure of the corset is an extension of the natural body, with sharp tailoring composed of many pieces and lining reminiscent of Medieval and Renaissance metal plated warrior dress[16] (Figure 18: corset shelters).

[13] They created a patent-pending 3D printed textile, that resembles the chain-mail fabrics of Paco Rabanne.The difference of the fabric from the one that Paco Rabanne has created is that the entire fabric is compiled in one go from nylon powder, with the links which don't have seams. To create a 3D garment, new fabric topography has been engaged to the body (Lee 2005: 134) (Figure 16).

[14] Alexander Mc Queen brings together sexuality, death, transgression in an image evoking a certain perverse pleasure. In his collection *Untitled*, the fashion body could also survive pathology and abjection by armouring itself through clothes. The accessories he incorporates razor-sharp metal pieces like thorns, threatening animal horns or a knife headpiece which recalls a kind of sexual violence, and function not only as symbolic or aesthetical accessory but as a defensive equipment (Figure 17).

[15] The term is taken from Marcel Proust's novel 'Remembrance the Things Past'. In the modern history of fashion Proust has been usually taken as a reference to underline the infinite and self-perpetuating nature of past as the driver of modernity in a way Lehmann (2000) calls as 'Proustian fashion'.

[16] Olivier Theykens's black corset with extended hood had connotations of 19th ayslum and madhouse; Hussein Caglayan's surgical corset representing an injured body after a potential disaster as he imagined of battle of Armadeggon whereas his wooden corset, fastened with chrome screws (Figure19).



Figure 18. Corsets from Olivier Theykens and Hussein Caglayan (Ewans 2003, Caglayan 2005).

Urban outfit designers, not only provide a protection against attackers through garments, but by the use of clever detailing they create garments which may confuse and frighten potential attackers Vexed Generation, were inspired by the undercover detailing material used in military and police body army to create bullet-proof garments. They developed solutions to prevent surveillance and traffic accidents by ensuring full facial coverage without loosing peripheral vision and by strengthening the garments physical properties.[17] The CP Company, integrates mechanical features into designs in order to ensure personal safety.[18]

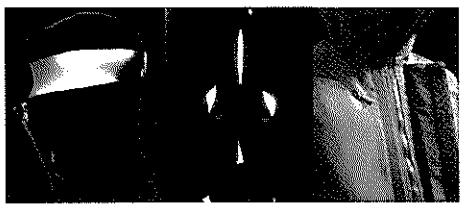


Figure 19, 20. Seen and be seen jacket by Vexed Gen, 2002 (Bolton 2002).
Figure 21, 22. Vexed parka in ballistics nylon by Vexed Gen, 1996 (ibid).

[17] In *The See and Be Seen* collection, they incorporated high visibility reflective panels into garments to prevent accidents in the street, enhancing the visibility of individuals on the busy city roads along with inserting extra protective components like reinforced patches on elbows and knees. The *Techtonic Jacket* (A/W 2000-01) and *Vexed Parka* (2002) made of several layers of ballistics nylon to be truly bullet-proof. (Bolton 2002; Quinn 2003; Smith and Topham 2005) (Figures20,21,22).

[18] *Solo Gilet* (A/W 1999-2000) featured a large Maglite torch on the back to be used as a guide, while the wearer passing through dark city streets while, *Munch Jacket* (A/W 1997-98) had a fitted high-pitched personal safety alarm (ibid) (Figure23).

Clothing as a portable environment: nomadic experience

Urban dwellers occupy several temporary habitats, and spend longer time there than at home' (Queen 2003: 96). Travelling has become the basic movement for a city dweller, not only experienced by moving from one destination to other, but also through the transitional spaces of the city. Movement for a modern individual is no longer a planned action, but has become an obligation, especially in case of a need to escape and a refuge from an urban catastrophe, thus necessitates a specific type of clothing.

The first attempt of creating a multi-functional clothing for a mobile individual came from Futurist Manifesto, in 1909. Futurists were aware of the importance of "speed" for our century long before Paul Virilio underlined its importance in the post-industrial era. They designed garments like a piece of art, but their understanding of clothing pointed to the principles of the multi-functional clothing of today (Thayaht). went further and designed multi-purpose everyday, universal clothing, as an all-purpose garment called 'tuta' which promoted economy both in fabric and construction, while increasing agility and flexibility (Cheunoine 1993:142).

Yeohlee coined the term *Urban Nomad* as a response to the needs of an ultra-modern 21st century, the fast paced city dweller, who, just like the flaunese of Baudelaire, traverses the urban realm. She, describes the impact of urban signifiers on fashion construction with multi-purpose garments with maximum functionality and minumum construction with a sense of refugee.[19] Her precise engineering and economy in tailoring creates a formal expression with a touch of comfort, with the physical characteristics of active sportswear. By balancing the construction of simplified lines and conventional cutting against geometry and the natural movement of the body, she achieves a dynamic structure and motion through her garments (Quinn 2003:100-114).

[19] *Urban Nomad* (A/W 1997), was one of her collections that Yeohlee naturally departed from her needs: "I would like to travel wearing the most efficient outfit possible. I would want my outfit to define my space, making a clear and concise statement about my relationship with my surroundings" (Quinn 2003:112) (Figure23)

Architecture is a strong driving force for her designs. Using Kean Yeang's principles of designing bioclimatic skyscrapers that constitute micro climates, Yeohlee layers different materials for adaptation to the climate, thus developing a particular construction by the use of tiers rather than through conventional layering. This gives the body freedom, while allowing efficient circulation, ventilation and body heat retention. Her use of performance fabrics such as teflon, polyurethane, nylon and polyester which are unusual for a high-end fashion product, create breathable, waterproof surfaces which make the wearer adapts to environmental conditions. As Richard Martin credited Yeohlee with developing a *'fifth season 'of fashion'* due to her breathable designs (Quinn 2003:114).[20]



Figure 23. Yeohlee's high-end designs with performance features for urban nomads (Quinn2003 and Bolton 2002).

Certain designers look to nomadic experience as the struggle to survive against the modern urban realm of risk, danger, and anxiety due to injustice, opression, exclusion, crisis, alineation and fragmentation. They question social justice, humanism and the social progress of modernity through in-between structures and transformable clothing. Hussein Caglayan, departing from a catastrophic situation, renders the need for mobility and refuge by creating transformable object-clothes which function as portable environments. He challenges the boundries of dress by transferring different materials and know–hows to fashion. 5peed and flight are fundamental inspirations in Caglayan's themes. To give the idea of speed within the territory of the human body, he depicts mechanical objects and vehicles as extensions of the human body.[21]

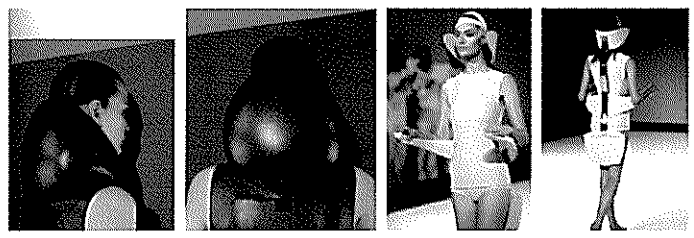


Figure 24. Extension of a car interior from Echoform and chair dress, by Hussein Caglayan (Caglayan 2005).

Clothing as an interactive environment

Along with the mobility, the needs and the conditions of urban environment, there is a need for the individual to interact with his/her environment through the garment, hence creating an interactive environment with the use of the garment. Japanese designer Kosuke Tsumura envisages that clothing will eventually replace housing altogether and function as the city dweller's final home. His plan is to equip the urban nomad with the means to colonize the public spaces of the city (Quinn 2003:97).

His fully equipped garments, described as a *mobile home*, enable urban nomads to spend a night away from home in case of disaster, with extra warmth and enough supplies. He employs a *multi-pocket system* to give the wearer the

[20] Ewans (2003:283) refers to 'fifth season' as a 'world in which nature is effaced (for ex. Vexed Generation's use of phase-change fabrics that regulate body temperature, first developed for NASA) and the metaphors of jungle and desert are played out in the urban landscape. The fifth season might be technological; it certainly existed in a parellel universe to the natural one. What perfume would one wear during the fifth season?'

[21] In his *Geotropics* collection (S/S 1999) he showed a chair-dress, in a way that a chair was integrated to a model symbiotically, as they appeared to be a single identity. Caglayan through that chair-dress, re-semantified the conventional dress in order to transform a portable, personal environment in which the model can sitdown whenever she wished. In *Echoform* (A/W1999) he took inspiration from interiors of cars and planes as two machines best symbolize speed, created neck cushions as echos, reverse extensions of human body within the vehicle. *ChairDress* that he created for *Geotropics* (S/S 1999) created a portable environment in such a way that model and chair appeared to be a single entity and the model could sit down whenever she wished (Caglayan 2005) (Figure26).

possibility of organizing personal things as well as storage and mobility. 'Pockets are an integral feature of supermodern clothing', (Bolton 2002:45) pockets function as compartments, providing the wearer with a place to store belongings, along with a certain degree of *personalisation* and *communication*.[22]

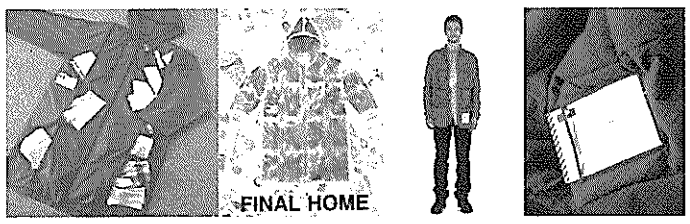


Figure 25. Tsumura's and Caglayan's multi-pocketed interactive jackets (Quinn 2003, Bolton 2002, Caglayan 2005).

Like Tsumura, Caglayan also designs interactive clothing in order to give the owner the possibility of re-structuring the garment for the needs and experiences of urban life, rather than merely as a finished garment. Pockets play a vital role in providing a communication with others, creating a personal space embedded in the body, filled with signs of the wearer's identity.[23]

Dress as a collective experience

Lucy Orta struggles against exclusion, combining architecture, body, art and fashion with social dynamics, ideological activism and political agendas. Thus, her principle projects include spatial scenarios, works of art, architectural prototypes and interactive platforms portrayed around the body, establishing physical links between individuals which symbolize emotional, intellectual, social and spiritual ties through transformable structures.

In creating an interactive environment through clothing, she proposes a social space for individuals in response to social fragmentation, solitude and desolation in modern society. She designs series of individual outfits that have attachable tubes of fabrics that can zip the wearers together in a single garment, thus become collective wear, as she terms it. Orta's collective wear proposes a shared space encouraging physical contact and cooperation among wearers, as well as an exploration of individual feeling and movement, thus facilitating them to design and produce their own garments.[24]

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[22] In his Final Home collection undertaking a coat as the body's final home, Tsumura integrated pockets to jacket, eliminating the need for backpacks, luggage and even tool kits. In Tsumura's jacket ,the pockets have loaded the garment with signs related to wearer's identity and character.' The transparency of the outer pockets enables the wearer to customize surfaces of the jacket, filling them with pictures, postcards or artwork to create different surfaces' (Quinn 2003: 102) (Figure27).

[23] In his menswear collection *Place/Non Place* (2003) the jackets structured almost with pockets. The garments filled with transparent pockets transformed into displays of communication with the world outside through which the wearers can exhibit their personal photographs and things. By conceiving a design process in which the wearer could give the latest form and meaning to the garment, Caglayan aimed that the memory and experiences would create a sense of space through garments in which non-place could be transformed into a place. Hence the garments are perceived both as personal environments, and place making symbolic containers that can be constructed through memories (Kipöz and Güner 2006) (Figure27).

[24] In Body Architecture symbiotically anorak becomes the sleeping bag, bag turned into a tent after which it becomes a container, providing a framework in which individuals narratives can be expressed textually. In "Nexus Architecture" Orta used the hooded overalls* of Greenpeace activist during anti-nuclear protests. Through events and workshops targeted at marginalized social groups like migrant labourers, the homeless and the inner-city teenagers, she made them to produce their Nexus links; in addition to this Orta organized a cross-cultural workshop among teenagers and art students from France and New York, that each participant produced an individual panel of fabric that would be attached to others and form the walls of a transatlantic mobile shelter. Later she developed that work in to an interactive website that she called 'fluid architecture' (Quinn 2003:166-171) (Figure 26,27). *Orta expresses the reason why she choosed the basic worker overall as a form of dress": this form suggests uniform, uniformity and membership of a group. It provides a shelter against individualism and reinforces the strength of the collective" (Bolton 2002:138).

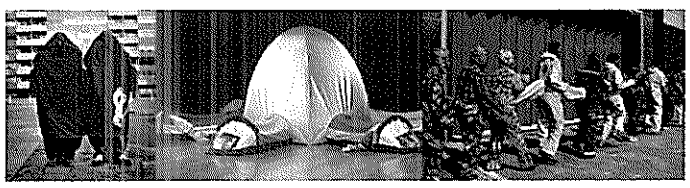


Figure 26. Refuge wear 1992, Collective Wear 1994, Nexus Architecture1997 by Lucy Orta.
Figure 27. Orta's collective structures to create a social interaction: & Nexus Architecture.

Virilo's social criticism 'concerned with the breaking down of the family unit and the reconstruction of the social link' encouraged Orta 'to explore interconnections and find new ways of creating as dialogue' (Bolton 2002:138). Through her work, Orta, not only responded to Virilio's concerns of re-creating social links with the structures between body, space and the object in order to propose a pluralistic and democratic social structure, but also re-grouped the individuals in threatening events such as street gangs, subversive cultures, and terrorists, as well as uniting them against natural disasters such as earthquakes and floods.

Dress as a technological medium

Mobility and nomadic experience that we encounter in our everyday life in the urban metropolis, leads urbanites to integrate technological devices, like laptops, mobile phones, MP3 players, PDA (Personal Digital Assistance), and digital cameras which are personalised within the territories of our bodies. Thus, *humanisation* and *aesthetisation* of technology becomes inevitable; the body and technology live symbiotically in one entity, with the interface of technology in the form of an interactive wearable.

Prof. Steve Mann, who Virilio sees as 'a pioneer of the second revolution of speed age: the *revolution of transmission*' defines wearable technology as 'a system which partakes of the personal territory, in control of the user, being operative and continuously interactive, always open and accessible'. In the mid 80s, Mann's experiments in the MIT labs were the first signal of the symbiosis of technological devices and the human body. Mann, with an anticipation of technological excess of today, challenged the anti-utopic view of man-machine systems, seeing cyborg and cyborgism as a condition of post-humanism, (Mann2003) a *post-cyborg* structure.[25]

His early experiments of wearables were bulky, with heavy components bolted to helmets, strapped on with belts and carried in backpacks (Lee 2005:16). He gradually incorporated the revolution of miniaturisation into his designs through wearable computers and eye camera with optical readers, thus deconstructing technology. Virilio considers this as the third revolution of the speed age, technological reductionism (1997:50).

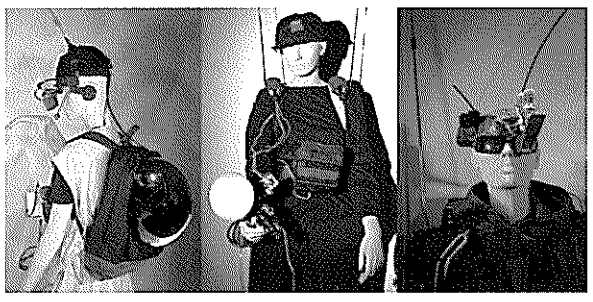


Figure28. Steve Mann's solutions for wearable technology.

The new technological landscapes, are referred as 'mapping the development of electro-textiles and smart fibres through biotechnology and nanotechnology' in the field of wearable technologies (Lee2005:17). The term *wearables*, *smart clothing*, and *wearable computing* are synonymous terms used to describe a genre of clothing that functions at an electronical

[25] The term 'Cyborg' which orginally referred to the combination of cybernetics and organism by Manfred Clynes and Nathan Kline in the 1960s turned out to be changed into a science fiction character by the mid 80s when Donna Harraway used the term 'cyborg' to invoke the science-fiction/cyberpunk image of the robot/flesh creation as a metaphor to illustrate how less obvious technologies had already impacted human life (Farren and Hutchison, Fashion Theory 2004:463) most probably promoted by the films like Terminator, Robocop and Blade Runner. The disutopic character of cyborg could be related to excess by Auge (1995) and 'abundance of information' by Mc Luhan (1989) to create a 'technosphere' as Virilo (1997) suggests, which was evident with Gibson's Johnny Mnemonic or lately paradox of the Matrix.

level, capable of processing information on the moving body (Lee 2005: 43). Miniaturised technology has been incorporated into the body through the digital convergence (Kotro-Pantzar 2002) of *hyper-functional* objects (Giordano 2002:124); through *transparency* and *invisibility* along with the *ubiquitous computing*[26] of wireless communications (Lutyens 2002); and through emotive engagement with the technological interface, and thus humanisation and personalisation (Kipöz 2002;2003).

The experiments and inspiration for developing intelligent garments has stemmed from the military use as wearable information processing for soldiers. On the other hand, because of the necessity to create a mobile workspace in the transitional city space, and to empower oneself to dress up as techno-armour against disasters of modernity, wearable electronics and intelligent clothing that Bolton defines as 'fully wired-up, plugged in body' (2002: 49) has become the realm of an urbanite. Using ubiquitous technology and creating an interactive environment or an *ambient intelligence*, as Philips defines it, is a natural reflex of late modernity in reaction to the contingencies of the urban environment, escaping from the electronic gaze and active protection from possible dangers. As Bolton (2002:18) states 'Wearable technology, confers a certain degree of control over the wearer's environment. Not only does it offer wearers the choice of whether or not to connect or disconnect to a wider environment, it also allows them to react to this wider evironment actively or passively'.

Philips is one of the most proactive design companies in incorporating information and communication technology and intelligent materials into human body and life experience. The brand explores the role of the smart clothing for people who live, work and play in the future. Considering the idea of 'technology dealing with fashion' their intention is 'to create human-focused solutions making the electronics industry think emotionally' (CEO of Philips design, Stefano Marzano in Lee 2005: 45).[27]

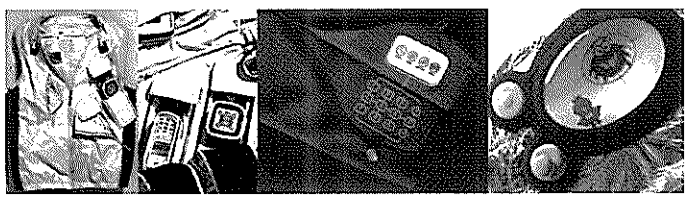


Figure 29. Philips-Levi's, Industrial Clothing Division and Philips's protoype of playsuit for children,2000 (Bolton 2002).

The dilemma is the high price of the 'wearable' incorporated with extra technological elements, designed to address the fear of crime, as the garments, considered 'cool'[28], might result in the wearer being the object of envy and, ultimately, robbery and physical violence. Considering this, Philips started to think about how wearable technology could be used to make people safer. They experimented with clothes designed for children which could provide stimulation, fun and safety, whilst giving parents peace of mind[29] (Davey, Wotton, Cooper, Press, Heeley 2003: 51).

Mentges (2000) points out that redefining technology, and thus hi-tech garment, is an entirely male domain and closely

[26] The term ubiqutious computing invented by Mark Weisser in 1988, (head of Computer Science Lab. at Xerox PARC (Paulo Alto Research Center) to describe a future where invisible computers would be embedded in everyday objects, explaining this as the most profound technologies are those that dissapear. They weave themselves in to the fabric of everyday life until they are distinguishable from it (Lee 2005: 45).

[27] They first developed an experimental range of ICD denim jackets with Levi's. Philips-Levi's© Industrial Clothing Divison Plus range (ICD+TM) (2000) to increase connectivity through functionalities of voice recognition mobile phone and Rush Mp3 player of Philips to create a fully equipped' plugged-in' individual. Philips took this project further in to Personal Area Network (PAN) project for embedding electronical softwares in to personal territory in a fresh approach to future lifestyle and fashion (Figure29).

[28] Gabriele Mentgess (2000: 42-43) explores the state of 'coolness' within the context of developments in technology and particular means of mobility, where the body is exposed to extreme conditions caused by velocity, as the construction of new corporal language and entirely new discipline of the body and the mind in a sense that while creating a distance from the other, body and senses imply and require an elaborate kind of communication. Clothing in this process gains particular importance especially through development of techno-textiles which in turn become a highly sensitive supplement of the body, not only to reinforce it, but to extend and widen its forces.

associated with masculinity. Paradoxically, technologically wearable cloths are of particular value to women who have found themselves historically in positions of vulnerability. In response to this, designers Adam Whiton and Yolita Nugent created specifically for women facing risk in the urban environment, challenging existing power landscapes between men and women, creating a political statement or symbol of empowerment for even those who are not feeling themselves at risk.[30]

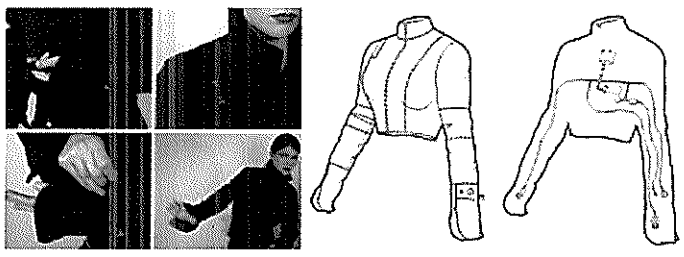


Figure30. No Contact Jacket, Adam Whiton and Yolita Nugent (Smith & Topham 2005).

Urban Camouflage is another issue to consider in providing both an interactive and safe ambience for the individual through clothing. Wearable technology provides the possibility of invisibility through smart textiles and hi-tech materials. Susumi Tachi with 'invisibility cloak' makes the wearer invisible by the use of retro–reflected material, used in the manufacture of road signs, which works like a screen.[31]

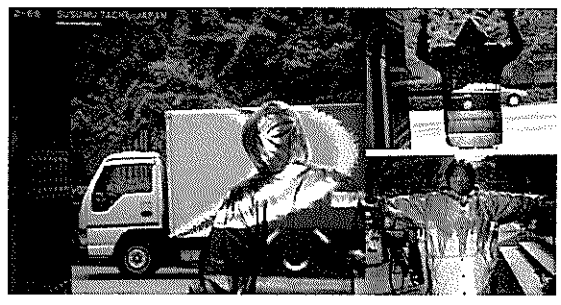


Figure 31. Invisible Cloak by Susumi Tachi (ibid).

High–fashion incorporates technology in a way which increases the established roles of dress, resulting in a kind of 'hyper-garment' (Lee 2005: 81). Designers re-semantify the garments through the signs that technology connotes, as Alexander Mc Queen (1999/2000) appropriated computer circuitry as a decorative pattern to signal a futuristic aesthetic, featuring android like models wearing body suits printed with luminiscent computer circuitry. (ibid: 52) Victor & Rolf (A/W 2002) created an illusion of a fabric, described as chameleon camouflage, to play with the idea of *invisibility*, ubiqutious technology which proposes replacing outfits with digitally projected images, employing a process known as bluescreening (ibid: 81).[32]

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[29] The clothes have various technology embedded within them including Global Positioning Satellite (GPS) with fabric antennas, mobile phones with radio tagging and digital cameras in the form of miniature remote cameras. The interactive feature of designs allowed physical characters with identity chips to be attached to the garments, so that they can see each other on the screen, and play through the images. In terms of providing safety the technology allowed to pinpoint the location of child, enabling guardians to confirm the child is safe, and providing an opportunity to support them in their games, through mobile phone (ibid).

[30] No Contact Jacket' as they describe as 'exo-electric armor' is worn like another jacket, but when the wearer feels unsafe or threatened she is able to arm an in-built defense mechanism by means of key lock that discharges a stinging electric shock; protecting the wearer from the electric current by an insulated rubber built in to the jacket, instill women with greater feelings of power and security (Smith and Topham 2005: 3-118). The jacket has been found not just acceptable but desirable more than hand-held alarms (Lee2005:156). (Figure31)

[31] Images are shot by a camera placed directly behind the subject , relayed through a computer, and then projected on to the front of the coat. Tachi hopes to apply the technology for 'seeing through' a solid object in the future, like the interior of a car when trying to park. The clothes in the future might be used to carry all kind of images, as V&R created the illusion, if the development of smart fabrics that behave like LCD screens would be possible (Smith& Topham 2005:2-66). (Figure 32)

[32] Blue screening is a process used in the movie-making and television where anything painted blue pigment can be digitally isolated and replaced with another image. Thus each model was projected on to giant screens, the images of the clothing substituted by a mountain range, sky or city scapes, the body dissapearing in to a virtual background. (Lee 2005: 81) (Figure 34)

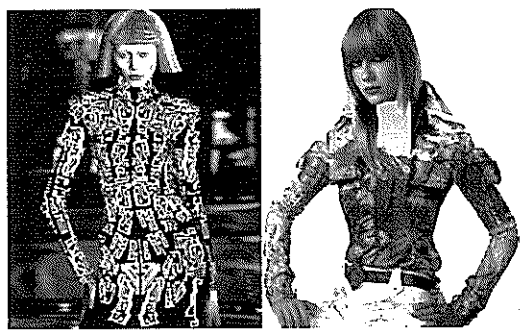


Figure 32. Alexander Mc Queen's printed computer circuitry (Lee 2005).
Figure 33. V&R blue screening image projected garment (ibid).

Conclusion

Modernity, has created the consequences of risks, dangers and crises within its complex social structure. Hence, the face of fashion, in the construction of a social attitude and clothing behaviour, has been drastically changed in response to the social transformations of modernity. Fashion, as the fundamental mechanism of creating desire and glamour, has created its counterparts by transforming itself into a display of social decay, uncertainty, anxiety, corruption, dereliction, melancholy and dystopia. Clothing and the understanding of dress has become a reflexive response to this transformation, acting as a defensive mechanism to the real and perceived problems and risks of modern society. The new understanding of fashion deconstructs its boundries, conventions and history into a novel body of knowledge and structure, in the form of the post-industrial fashion of Ewans, and the *post–fashion* or *after-image fashion* of Vinken. Fashion, more than ever, feels responsible for a social structure suffering from inequalities, isolation, trauma, opression, homelessness, fragmentation, alienation, disruption, disorder and disaster.

In this context, the language of dress has been developed into a *multi-character* entity, *hyper- clothing* in the form of a *protective shelter, defensive armour, portable environment, interactive ambient* and *technological hyper-medium*. The new dress, defined as *multi-functional* or *supermodern* as Bolton calls it, is not only a symbiosis of space, object and the human body in between the disciplines of architecture, design, art, science and fashion, but a means of social and cultural discourse in order to re-define the ontological position of the modern individual. Fashion, through clothing re-defines the body, and also becomes a means of social reaction, creating a body of discourse, proposing a solution to free oneself from the risks and problems of modern society. The technical, high performance garment or conceptual dress of contemporary fashion, has been deconstructed once again into a form of clothing which acts as a *hyper-medium*, in which the structure and functional elements of the modern garment, such as pockets, hoods, functional trimmings like zippers, and smart textiles, have been re-semantified to empower the individual against the unexpected and undesired conditions of urban life.

On the other hand , inspite of the ethical discourse created by the clothing design which are examined through this paper, most of the conceptual examples related to high fashion has constituted a category of wearable art, where as high performance, multi-functional garment taking their roots from military, medical and industrial wear, are likely to be interpreted as experimental and unaccessible due to their high-costs and technical, cold looks.

Therefore they present difficulties of adoption to social–self image and practical use in case of an unexpected danger or disaster of the urban individual.

With these considerations, a design project has been carried out with a group of fashion design students. The aim of this project is to search and experiment conceptual and physical possibilities of design practice of disasters and risks in the modern society. By de-constructing fashion, designers tend to design garments to be adopted, realized and used in case of a disaster or everyday life risks of urban environment in a more practical and socially confident attitude. Results of this study have been exhibited within the halls of this conference, which has been examined with the further article within the book called "Dress Against Disaster" (2007).

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DESIGNING BIOPLASTICS PRODUCTS

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Abstract

The ongoing need to keep reducing trial-and error in product design applies to plastics products, and perhaps even more to bioplastics. The bioplastics market, however small, is rapidly growing. Much of this growth can be attributed to packaging, films, and bags. Applications in injection moulded products have been less numerous until now. Injection moulding typically offers design opportunities for mass production, mass customization, and efficient material usage. The benefits of new opportunities offered by material improvements, new materials, and new technologies will only be expressed in actual products if all benefits are understood and used as needed, and all existing and new challenges are met.

Bioplastics offer partly unknown opportunities and challenges which may necessitate revision of the current design guidelines for injection moulded bioplastics products as well as adjustments to current practices of plastics injection moulding. Advantages and disadvantages of bioplastics are not always fully clear, partly because product behaviour cannot yet fully be predicted, and even more because life cycle issues are very complex and often do not allow final conclusions.

Another factor remaining essential in designing injection moulded plastics products is to optimize unavoidable weak spots in products, such as flow weld lines. The reduced mechanical perfomance depends considerably on the combination of geometry characteristics and moulding parameters. These factors were addressed as part of a research activity involving experimental work as well as developing appropriate design support.

Specimens from products moulded from two bioplastics were found to have better impact strength than for a polystyrene, in product regions both without and with flow weld lines. Certain non-trivial injection moulding settings, which reduce the impact strength in neat product regions, were found beneficial for weld line properties. Such results are important for iterative product design optimization for mechanical performance and manufacturability.

Introduction

Material developments for bioplastics as well as certain bioplastics applications are rapidly progressing and are expected to keep progressing in the near future. Few product-related expertise in bioplastics is generally accessible at the moment. It is desirable to have a more or less complete picture of design opportunities and challenges, which will evolve with all the bioplastics-related developments. The present paper explores the current situation.

Designing injection moulded plastics products

Plastics are a good example of a broad class of materials which have offered new design opportunities and challenges compared to more traditional materials. The developments are still progressing rapidly and include bioplastics-related developments which will be discussed in the next section. Plastics are usually appreciated because of their unparallelled versatility for shaping products [Plastics Engineering, 2001] and wide range of colour and visual effects options, serving both aesthetices and various other functionalities. Plastics have become successful in many applications, both for replacements and for new designs. Common benefits in replacement applications include: increased product differentiation, lower over-all costs, weight reduction, noise reduction, reduced number of parts by integration of product functions, simplification or even elimination of product assembly operations, and more [Carrabine, 2002], [Beall, 2002].

New designs may be successful if specific opportunities offered by plastics have been used creatively. For example, two or more materials may be combined in a single part by multi-component injection moulding in a way that could not be achieved by conventional assembly of separate parts. Hard-soft combinations, for example, usually consist of a thermoplastic and a thermoplastic rubber. The increased demand for thermoplastic rubbers has driven material improvements. The materials involved have sufficient adhesion nowadays, such that the material components in a part no longer need to mutually enclose one another [Boer, 2006]. This is an illustration of product design guidelines evolving with material and technology developments.

Whereas the large number of design opportunities offered by plastics enables a great design freedom, dealing with them and keeping up with the latest developments is a challenge. Other challenges for product development with plastics are the complex material behaviour, both during manufacturing and in the final product, and the complex interdependence of factors [Kennedy, 2004]. Thinking in plastics by designers and applicators includes considerations of product realization and requires different manufacturing and assembly philosophies [WJT Associates, 2005], and hence different views on product architecture. Preliminary design stages require a rather high level of detail if design and development are to proceed effectively and efficiently [Mascarenhas et al., 2004]. An interdisciplinary team approach is necessary when dealing with plastics, starting from early design and development stages [WJT Associates, 2005].

Present status of bioplastics

On a molecular scale, bioplastics are somewhat similar to oil-based plastics, i.e., they consist of molecules with long chains, called macromolecules. Similar to oil-based plastics, most bioplastics only become practically useful after addition of one or more types of additives [Jongboom & Dartée, 2006]. A major difference with oil-based plastics is that most bioplastics are produced from annually renewable resources, most of them agricultural feedstocks at present. The first step towards bioplastics is always to obtain suitable and sufficient biomass from the applicable resources. After this first step there are currently three different routes to arrive at bio-based macromolecules [Yu et al., 2006], [Jongboom & Dartée, 2006]:

- extraction of naturally occurring macromolecular materials from resources;
- synthesis of macromolecules from naturally occurring materials in resources;
- microbial activity generating macromolecules from naturally occurring materials in resources.

Examples of naturally occurring macromolecular materials are starch, protein, and cellulose. Starch appears most promising among these materials. Common sources for starch are crops, wheat, potato, and rice [Curvelo et al., 2000], [Gaspar et al., 2005].

The best known synthesized bioplastic from natural materials is polylactic acid (PLA), based on lactic acid derived from starch or sugar, which can be, in turn, extracted from corn, potato, sugar cane and other sources [Hakkarainen et al., 2000], [Jongboom & Dartée, 2006]. Certain additives in PLA enable different degrees of reduced brittleness and reduced stiffness.

The best known macromolecular materials generated by microbial activity are polyhydroxyalkanoates (PHAs). The most common PHA is polyhydroxubutyrate (PHB), a high

molecular mass energy storage product of certain bacteria and algae [Moore & Saunders, 1997]. Copolymerizing PHB with hydroxyvalerate enables miscellaneous compounds with different degrees of reduced brittleness, reduced stiffness, and reduced cost [Türesin et al., 2000], [Savenkova et al., 1999]. Another example is poly-3-hydroxybutyrate-co-4-hydroxybutyrate copolymer. Adjustments to its material composition enables a range of material properties from hard thermoplastic to rubber-like [Snell et al., 2001].

New developments of bio-based plastics are ongoing and are at different stages of applicability. An example is a method to derive molecular building blocks for polyester or polystyrene directly from an ingredient of fructose, which is a sugar found in fruit, corn syrup, and honey. The efficiency of the process needs inprovement [Ball, 2006]. Another example is a glass-filled material consisting for 37% of renewable corn sugar-derived material, having properties similar to the engineering plastic p olybutyleneterephtalate. This partly bio-based plastic, Sorona, is being developed by Dupont. Sorona is also being applied as a molecular building block for a thermoplastic rubber, Hytrel [Plastics Engineering, 2006]. For tissue engineering, a bio-based rubber-like material was developed at Massachusetts Institute of Technology [Thomson, 2002].

PLA is also available in the form of fibres, known as Ingeo™, by NatureWorks. This material can be applied as a filler material and in textiles, giving a softer feel than most synthetic fibres [Vink el al., 2004]. Composite materials of PLA with inorganic fillers or nanoclay have been studied too [Uruyama et al., 2003], [Paul et al., 2003]. Some of such materials have improved thermal stability, strength and stiffness, although the balance of properties still needs improvement.

The above examples are a few selections from many new developments which are expected to be going on, enabling new design opportunities in addition to the existing ones.

In spite of the uncertainty about future developments, several forecasts exist about the expected growth of bioplastics. Worldwide bio-based plastics consumption has increased from 40 000 tonnes in 2000 to 270 000 tonnes in 2005 and is predicted to be 800 000 tonnes in 2010 [European Bioplastics, 2006]. Most of the current bioplastics market consists of films, bags, and miscellaneous packaging products. Applications in injection moulded products, suitable for material-efficient products made in large production volumes, have been less numerous until now. Market growth is expected to be accompanied by higher production efficiencies, enabling declining material prices which currently are, on the average, 70% to 80% higher than the commodity plastics they usually replace [Toensmeier, 2004]. Enhanced performance materials are expected from more sophisticated synthesis and blending techniques [Freedonia, 2006].

Design considerations for bioplastics applications

Similar to the oil-based plastics enabling a great design freedom as well as posing major challenges to be overcome, the same is likely to be true for bioplastics. Opportunities as well as challenges will partly depend on:

- properties enabled by material characteristics;
- conversion of materials to products;
- perception of bioplastics products by consumers;
- price.

There are other important factors, such as business activities, government regulations, and activities by institutes for research and education. These factors will not be discussed in this paper.

The perception by consumers is obviously essential. It should be noted that most bioplastics as supplied in their basic form, i.e., without colourants etc., do not clearly look, feel or sound different than plastics in general, even though physical and mechanical properties may be different. It may be desirable that products by themselves, i.e., without fully relying on additional information, convey to the user that they contribute to a more sustainable world, or to a better world in another respect. This obviously requires that such products do actually contribute to sustainability, based on the current state of knowledge. Life cycle and environmental considerations will be briefly discussed in the next section. Communication by products is an issue well known by many designers and will not be discussed further. The remaining discussion in this section will concern objective factors and uncertainties.

A wide range of material properties and property combinations is offered by the currently available bioplastics. Perhaps the best known property is biodegradability, which will be discussed in the next section. Other possible properties include breathability (water vapour transmission) and water solubility, one or both of which may be obtained by using starch-based materials. Manufacturability with starch-based plastics, requiring water as a plasticizer, has been improved considerably over the past years but is still challenging [Chen et al., 2006], [Curvelo et al., 2000], [Jongboom & Dartée, 2006]. The delicate balance between manufacturability and mechanical product properties depends on water absorption capacity in a complicated manner: if it is not optimum, the final product will be brittle [Chen et al., 2006]. Successful examples of starch-based products include films for food packaging and garbage, and thermoformed packaging products [Jongboom & Dartée, 2006].

A wide range of mechanical properties is offered by PLAs (optionally blended with other biodegradable polyesters) and PHAs, comparable to commodity plastics at the lower end, to synthetic polyester-like or rubber-like properties. Exceptional stretch recovery characteristics are reported for Sorona, better than several polyesters and nylons [Kurian, 2005]. Some typical characteristics of PLA include: similar or higher stiffness than polyesters attainable, deadfold twist retention, good permeation resistance to grease, many aromas and flavours, and several gases, printability without pre-treatment, and good flammability resistance [Jongboom & Dartée, 2006]. The range of material properties by different compositions of poly-3-hydroxybutyrate-co-4-hydroxybutyrate copolymer enables applications from low-cost moulded goods, fibers, coatings, and adhesives to replacement heart valves [Snell et al., 2001].

Bioplastics can generally be converted into products by existing principles of plastics processing. Particularly for injection moulding, it has been found for PLAs and PHAs that adjusted moulding conditions and specific moulds are required for obtaining quality products [Plastics Engineering, 2006], [Bucci et al., 2005], [Zhang et al., 2004]. A further challenge is that some bioplastics melts easily degrade as a result of hydrolysis, which would make relatively small plasticizing units on moulding equipment desirable. Although successful bioplastics products are being manufactured, and injection moulders are gradually becoming familiar with PLAs [Plastics Engineering, 2006], few publications are known to the authors which address issues related to converting bioplastics into products. The majority of publications concern material preparation, structures, properties, and developments.

Life cycle issues

A challenge for bioplastics is to verify and minimize the over-all amounts of energy and raw materials, as well as usage of agricultural facilities, needed to obtain processable materials [Gerngross & Slater, 2000]. The conversion of biomass to bioplastics requires energy which may be rather high for PHAs, particularly PHB: the energy demand is determined by such factors as fertilizer production, farming, corn wet milling, fermentation, and polymer purification. All of these factors combined may result in carbon dioxide emission which, over-all, may in some cases be higher than for obtaining oil-based plastics [Gerngross & Slater, 2003]. The figures would improve if renewable energy sources were used. The techno-economic feasibility of PHB production has been compared for two situations: it was uncompetitive in case of corn-based processes as carried out in the US, but beneficial in case of sugar mill-based processes as carried out in Brazil. Integration, such as in a sugar mill, is generally preferable over separate processes for obtaining bioplastics. The over-all cycle for PLAs is much less energy-intensive: about 60% of the over-all energy needed to obtain oil-based nylons. Technological advances and simplifications may likely enable an improved energy balance [Gross & Kalra, 2003].

Regarding end-of-life issues for products, most bioplastics can be returned to the environment by decomposition into natural organic materials. An option for such biodegradation is under so-called anaerobic conditions as in landfill. These conditions cause emissions of carbon dioxide and methane: the latter is a much more potent greenhouse gas than carbon dioxide [Gerngross & Slater, 2003]. It is feasible, however, to recover methane, using controlled gasification conditions. Composting processes, similar to the ones applied for plant trash, are an attractive alternative for bioplastics in landfills [Avella et al., 2005] and yield matter which is suitable to replace oil-derived fertilizers [Gross & Kalra, 2003]. For all biodegradation processes it must be kept in mind that the rate of the process is not a material property only, but also

depends on product geometries, i.e., area to volume ratios [Jongboom & Dartée, 2006].

Material recycling is another end-of-life option for plastics as well as bioplastics. In most known situations, however, plastics inherently compare infavourably to metals in particular, regarding recyclability [Biron, 2006]. Composting may or may not be the best ecological solution, depending on the nature of the materials, products and the collection system for used products. Energy recovery by incineration, which is also viable for several oil-based plastics, is basically possible for all bioplastics too [Reske et al., 2006]. It is almost certainly better than biodegradation under anaerobic conditions in landfill [Gerngross & Slater, 2003].

Life cycle considerations such as over-all consumption of energy and resources, over-all emissions, and end-of-life options, are subjects of study as well as discussions. The state of knowledge on these complex issues is expanding, although final conclusions are often difficult to draw. Changes in infrastructures may be required for ultimately achieving optimum over-all solutions, depending on the situation [Gross & Kalra, 2003].

An example of an appropriate bioplastics application is the BioClip® by Deleco (figure 1). Such clips offer an easy-to-learn way to prevent cracking, bending and damaging of crop trusses during growth. This is claimed to give the truss extra strength, providing better fruit quality and higher production. The clip is an injection moulded product featuring a snap fit and an integral hinge. The BioClip, made of a modified PLA (by Biopearls) is fully compostable within 12 weeks and may be therefore included in the plant trash (Deleco).

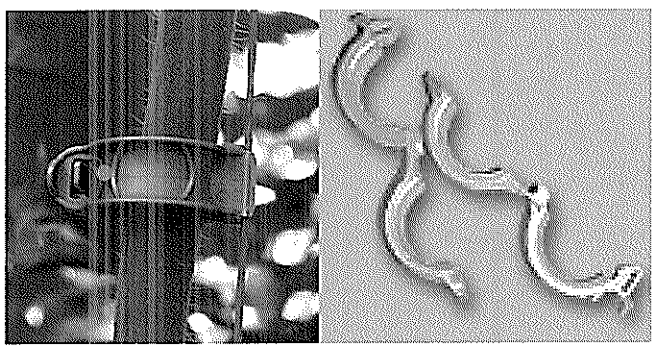


Figure 1. BioClip® by DELECO

Perceived needs and approach

Essential success factors for bioplastics products include processability, predictability and achievement of desired product properties based on material properties and processing parameters, material stability during product life, and controlled product biodegradation when desired after the end of product life. The autors' impression is that material properties and improvements for bioplastics have been and are being addressed extensively, enabling a myriad of future design opportunities. The same is thought to be true for biodegradability and sustainability, although the latter is such a complex issue that no final conclusions can be drawn at present. One of the lessons to be learnt from designing with the existing oil-based plastics is that most material substitutions require an experienced designer or dedicated experts to help translate material properties into product performance [Manisalco, 2003].

In addition to the largely materials-related research for bioplastics, more product-related work is thought necessary, particularly regarding conversion of materials into products, which, for oil-based plastics, is among the considerations in early design stages. Such additional work is certainly needed for product manufacturing by the many injection moulding principles, which are most complex for oil-based plastics and may be at least as complex for bioplastics. The benefits of materials will only be fully expressed in products if potential weak spots can be properly addressed in product design. Well-known examples of weak spots in injection moulded plastics products are flow weld lines at locations where two melt flow fronts meet during moulding.

Since designers need to deal with a large set of factors and often try to generate a more or less complete picture of product requirements, a design support activity is thought desirable related to application of bioplastics and other new materials. Such design support has been addressed elsewhere [Koster et al. 2007]. In conjunction with the design support activity an experimental research activity has been initiated, aimed at obtaining product-oriented results. Detailed description of the experiments as well as the results will be published in the near future. The applicability-related conclusions from the results obtained to date are summarized in the next section.

Preliminary experimental results

Several geometries with different shape characteristics were injection moulded, using a polystyrene, a PHB, and a modified PLA. Both the PHB and the PLA were found sensitive to degradation during plasticizing, particularly in the larger of the two injection moulding machines used. Therefore some of the results may still be less than optimum, and further processability research is needed.

An interesting result is that with PHB a better mechanical impact resistance than with polystyrene was found. This also applied to the weakest spot, the flow weld line, although the relative difference with polystyrene was less for this case. The best weld lines were obtained with injection moulding parameter settings which would be non-trivial for normal injection moulding practice. This indicates an optimization issue which has not been fully resolved yet, even for oil-based plastics. It is an interesting result, considering the drive towards minimization of material usage.

The mechanical impact resistance was generally better for the modified PLA than for the PHB, and almost as good as for an impact modified polystyrene, which, however, was not yet thoroughly tested.

Closing remarks

The initial results available until now are intended to contribute to application-related knowledge as needed for product development. The ongoing additional work will continue to be guided by application-related needs. The associated product design support activity will be useful for guidance and inspiration. The aim is to develop a systematic approach for dealing with novelties and challenges and for establishing missing information and expertise associated with new materials such as bioplastics in product design, as well as to contribute to product-related research results with practical value.

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VIRTUAL REALITY AS A MEDIUM OF DESIGN AND ART: AN INTERACTIVE VIRTUAL ATELIER.

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Abstract

In our digital era, with its extensive qualities such as simulation, interactivity and immersion, VR offers highly effective environment for various purposes. A necessity is being developed for our analyzing and expression methods of reality, by continious changes on our perception states about reality shaped by digitally formed data. VR, as an environment offering high quality simulation and capacity of constructing alternative fictions on the nature of physical reality, makes possible to realize new systems as much as new art forms. In the text, it is tried to explore the potential and limits of VR in terms of two different states: a design environment, which functions mostly as a tool, and an artistic medium, even a contemporary art form; discussed on an avant-garde project base on VR.

Introduction

The aim of the text is to discuss the two sided capability of VR; a design studio in the broadest sense, at the same time a medium for realization and presentation of art and design products, and to accentuate how important this potential for contemporary art and design by means of offering new horizons.

Firstly, VR is going to be generally defined and the relation between the reality and its projection on our perception of reality is going to be explored.

Then, main characteristics and possible connections with design process (as an evaluation period of an art or design work); and how VR possibly works as a capable virtual studio, comprehensive simulation environment tool is going to be explained.

As a conclusion, the vision about excessive capabilities of VR which are beyond simulation capability of constituting alternative realities (surreal or unreal) and systems (out of standard acceptance) as a medium of orientating contemporary art and offering new vistas of creativity is going to be discussed. Especially on an example, "*Osmose*" which is one of the precursors of the art projects related to VR is going to be analysed through the various remarks including Char Davies, who is the creator of the project.

VR, Definition

Virtual reality (VR) is a computer based technology that focuses on creating environments that simulate the real world or an imaginary world and allow a user to interact with. It seeks to stimulate all of the user's senses to have the sensation of to be in a real world.

This simulated environment can be similar to the real world, such as simulations for flight or combat training, or an alternative reality, as in video games.

Main components of Virtual reality systems are:

...(1) the reality engine; (2) the software; (3) various interfaces. The reality engine includes all the data required to build a virtual environment and make it function. Specifically it incorporates a geometry that describes the formal nature and position of the components in the environment (generally objects and actors), as well as dynamic specifications that determine how the various elements of the environment

interact with each other. The software sets the terms for the interaction between the user and the virtual environment. Various interfaces connect the human body and the reality engine and establish contact between the user and the virtual environment. These interfaces may include display helmets, coveralls and digital gloves; other devices that do not provide total immersion may also be added, such as stereoscopic goggles, gesture-tracing arms, biosensors and 3D mice (*The Media Arts Dictionary project*).

Application areas of Virtual reality systems are;

> In the military and aeronautics, among other fields, where they are used for specialized training and flight simulation; in architecture, where they are used, for example, to move through the three dimensional (3D) plans of a building in the design stage; and, still in the experimental stage, in medicine, where operations will be performed remotely on hard-to-access parts of the body. Applications also exist in the fields of art, education and entertainment (The Media Arts Dictionary project).

Virtual-reality hardware and software also continue to be perfected day by day in a considerable acceleration parallel to the improvements in technology.

VR, related to reality / representation distinction

In a broad sense since Antiquity, tradition of visual arts meant to mistake for reality. One of the main concerns of this tradition has been questioning the reality and creating an illusion of a world which was unreal, as stated:

"***Virtual reality*** systems seek to simulate real scenes so that they will be seen as three-dimensional. The issues at the heart of ***virtual reality*** are old ones. Leonardo da Vinci struggled with the differences between the perception of a scene and a painting of it, which he reduced to the differences between binocular and monocular vision" (Wade, Ono, Lillakas 2001: 231-5).

The artistic challenge has been continued with increasing ambition as art became more and more passionate about to explore various visions or perception layers of reality as much as various methods of visualising of it; it can be seen at the contrast between the two art forms of 19th century; Realism and Romantism as an example; realistic versus idealistic. Or trompe l'oeil is a stylistic painting form performed with an excellent technical ability aims to deceive the viewer to think that what it is seen is real; or surrealism explores a level of reality which is dreamlike or transcendent; or hyperrealism creates a simulated two-dimensional image of a three-dimensional reality on context of photographical vision...

Nowadays, as a zenith, mankind has arrived immersive computer simulations. At this point, as implied by Binkley; the gap between the idea and the reality has been decreasing:

> Virtual reality is both more and less real than analog presentation. But we are being challenged to rethink the reality/representation distinction. Our sense of reality is –paradoxically- a concept. It is an idea that has been formed by the history of our representations, and not vice verca (Binkley 2000).

Obviously, when speaking in this sense what is meant by realities is various representations of subjective perception of reality:

> Virtuality is not the opposite of reality. It is part of reality! Virtual reality is the semiotic domain of reality. Actual reality is the corporeal domain of reality. We now encounter signs in the state of algorithmic semioses. This is a new aspect of art and of the sciences as well (Nake 1998: 163-4).

Humpries contributes a new face to the problematic as questioning the corrolation between the reality and art; and characteristics of subjective perception about the truth which based on computer generated interpretation of reality.

> The most important questions concern the impact of the technology on the artist, the creative process, and the nature of art. It is not clear whether the nature of art resides in the art object or the subjective sensibilities of the artist and the responding audience. However, it is also clear that a journey taken to examine the ontology of computer art may lead to another avenue

> of exploration--an examination of epistemology, or the nature of truth and reality manifested in computer art, particularly with respect to virtual reality... (Humphries 2003: 13-31).

Reality is open to interpretation and art has been executing that at various states (visual illusion as much as layers of meaning) all along the history. VR explores and offers new possibilities about subjective expression for this technology-related era. Various layers of perception created by digital revolution expose the need for attributing different meanings to the relation between art and science; as much as nature and reality ever than before. Art based on technology (especially VR as an art form) tends to identify a brand new reality which has principles and rules of its own; since basically gathers its data from an abstract area.

Basic qualities of VR: simulation, immersiveness, interactivity

VR presents extreme possibilities for variety of disciplines as an flexible and expandable environment. It allows hybrid relations which is not possible to gain with other modelling methods; for example procedural description methods of complex models such as partical systems or fractal geometry.

Simulating the reality and to be able to do this as a compact system in interaction and handling as a concrete unity, presents a huge potential, since it opens the possibility to analyse the reality and the way to be interpreted, by means of generating fictional alternative realities or systems:

> Early twentieth-century art, including the works of Duchamp and the Cubists, attempted to portray aspects of a reality that were beyond sensory perception, such as multiple perspectives, the fourth dimension and curved space. Virtual reality (VR) now offers artists a soft medium for creating artificial experiences of space, time and energy through mathematical models (Brown 1997).

Sense of presence in, which is perceived in VR makes the working environment more intimate and accessible with a strong feeling of immersion, as implied by Luecking:

> The awareness of the video image as an alternate or substitute presence has been a staple of video installation sculpture since the early 1970s. These works question our perception of reality, by dividing it between its objective and technologically simulated versions. VR, however, has the potential to totally blur this distinction, either by projecting the video image into the architecture of the viewer's own space, or by immersing the viewer in the space of the video (Luecking 1994: 28-33).

Revolutionary technological improvements at the second part of th 21th century with a huge acceleration offering limitless possibilities, especially replacement of mechanical models with computational ones which is the essence of this revoluation, completely changed the forms of thinking and perceiving. Shifting from analog to digital media has been based on main concepts of virtuality and interaction. VR is not a system related to standart codes and procedures, but a medium of interrelations in which the participant and the environment are in a dynamic contact.

VR and design process; virtual studio

As mentioned before, we are exploring potential of VR with regard to two different points. As a tool, and as a medium. VR behaves as a virtual design studio with its excessive capacity: As a simulation based interpretation of physical world, in VR; hierarchical elements of dimensionality; dot, line, surface constitutes the form of the object by variety of logics in a certain order. Inter-dimensional modifications of a form (lineer or non-lineer) are possible in any level of the design process which offers great flexibility. Main characteristics which define the object such as color, size, texture (real or prodecural textures which depends on abstract mathematical functions), dynamic behaviors (including organic or mechanical behaviour systems as well), size, shape and interactions of the object which defines the relationship between space and object in a certain time and condition can be simulated in terms of various aspects of the constructed system (Bowers 1999).*

Spatial description and placement of objects, building up systems on related objects and observing from different point of views in a virtual space, and applying any kind of deformation is possible. Form, characteristics, interactions

of the object as well as time and motion act on it can be deformed; without the limits existing in physical world.

Since one of the main concerns about the design process is to have an understanding of relationships between the components on the way of a unique production which has to carry out a special functionality and an aesthetic form. In VR environment, all the concepts belong to a fact that take part in a compact structure, which are related to a unique model and interrelated between themselves, since it is a closed system; which makes possiple to see and control the big picture.

By using this potential, as a last step through the process, grouping the related components to get harmonic and / or functional unity is accessible.

VR gives scientific quality to the design process; since the parameters can be controlled and results can be observed simultaneously.

For complex subjects which are often multi-disciplinary in nature and requiring a blend of theoretical and practical knowledge, experiencing the theory itself is important for developing indepth understanding. Simultaneous feedback gained from the modifications is critical for the design process in terms of fluency.

Reproduction and modification of the existing models or systems in many ways, is another strong point of VR; it makes possible this, through producing high quality visualization and interaction.

At the main levels of design process like generation, evaluation, realisation, process itself needs a flexible tool and environment. VR offers to access an interactive virtual design studio, much similar to action in a studio or workshop, rather than in a lecture.

VR and art / new possibilities

In this section, VR is going to be explored as a medium in which art and design projects are embodied.

In general terms, "Art and Design" includes contemporary media such as television, video, animation, film and multimedia various disciplines as much as relatively traditional disciplines such as painting, sculpture, product design, performance arts, etc. The main distinction between art and design stands on the balance between function and aesthetic, which is getting blurred nowadays.

The key feature of contemporary art is it's concern with medium. Since mid-20th century art highly related to, or created with, the technology. New media art as a term used to describe this technology related condition, differentiates itself by its resulting cultural objects and medium used for, which can be seen in opposition to those deriving from traditional media arts. VR Art as a new media art form, offers completely new expansions.

Since VR is a medium based on an analytical approach; it has a structural purity; may be thought as a kind of highly extensive sembolic language. At the same time, concepts and methods referencing from real world methods and are put in a rational context; in a mathematical precision.

Humpries continues arguments about examination of epistemology with respect to extended possibilities of art via computer technologies:

> ...The surprising conclusion that students may reach through an aesthetic inquiry into the nature of computer art is not so much that it may be necessary to alter ontological criteria for art in order to properly assess the attributes of computer art, but that an exploration of the frontiers of computer art may lead to the discovery that it is necessary to modify notions of epistemology (knowledge of reality and what it is or could be) inherent in the unlimited possibilities of virtual reality (Humphries 2003).

Contradictory to often associated with VR, its only usage area is not representational simulation; but more than this, as mentioned before. The excessive power of creating dynamic and interactive structures without restrictions of physical world offers new forms of design as Brown states:

> VR creates the illusion of three-dimensionality without any of the constructive restraints found in physical reality. Via programming, I set out to develop the idea

of Dynamic Form—to create interactive virtual forms that encapsulated the interrelated concepts of space, time and energy (Brown 1997).

Brown outlines how he used VR for constructing a formation contradictive to reality and how he was able to out of restrictions of three dimension in one of his projects as:

> ...However, I found that the very three-dimensionality of physical materials were inherently restricting my ability to express notions of a fourth dimension. I became interested in virtual reality (VR), a medium unrestrained by physical and dimensional constraints. At this time, VR was used mainly for realism and representation—the synthesis of a perspectival, 3D space complete with accepted laws of physics. My project was to challenge these dominant paradigms and move towards abstraction—to synthesize a "virtual unreality" (Brown 1997).

Creation and interpretation of hybrid forms of art, design, engineering and science, in a multi-disciplinary interaction work together and that open new vistas of creativity and invention:

> Graduate programs at major U.S. research instittitions that are training a generation of hybrid artist/engineer/scientists, some of whom have entered the professoriate. As their numbers increase, their impact on the centrality of technology and science in the practice of art and design (and vice versa) will also force a reconsideration of the canons of art history and the histories of science and technology. One hopes that stich work will create new forms of strticttire and meaning that expand the languages of art, design, engineering and science, and that open up new vistas of creativity and invention.

In order to understand the evolving relationship between art and technology in contemporary art (and vice versa), one must grapple with the complex processes and products that sustain and restilt from these collaborations (Shanken 2004).

From this point of view, VR aims to build up a reality beyond daily experiences, a transcendent one. An unreal, almost mystique mood arise which gives a kind of ecstasic sensation. Reality occurs as a psychic or spiritual experience, on this perception level of reality. Form of reality defined by an individual depends on multiple subjective assessments shaped by the perception such as personality, experiences, point of view and characteristics of attribution; which makes the experience unique. Grau outlines this as:

> VR reveals itself as the heir to illusionism as manifested in its paradigmatic representative, the panorama. Although today the audince can exert its creative powers over the image, this control is counterweighed by the highly suggestive powers of the image itself. Maybe we are regaining a relation to the image that reaches far back into precivilized history, giving it a power that transcends a psychic as well as a physical boundaries and enables us to regress, leading to an ecstatic symbiosis of onlooker and image (Grau 1999: 365-371).

In this context, environment created in VR guides to another level of consciousness. In a new abstract space, basic concepts of knowledge regarding to existence such as time and space diminishes, new kind of different, uncertain excessive reality blossoms.

Owing to the underlying software nature of the virtual environment, a VR system can be put to many uses by loading different application environments. VR gives the chance to examine from different kind of point of views since enables to set up various theories and mechanisms on a subject. It makes this in a macro as well as micro scope, thus gives the chance of an understanding beyond standart limits. In this way, it has an enhancing and changing effect on the perception of reality:

> Jaron Lanier, VR pioneer, has said that VR sensitizes those who immerse themselves within in it for a period of time: There's this wonderful phenomenon where when you're inside a virtual world and if you take off the headmounted display and look around, the physical world takes on a super real quality where it seems very textured and beautiful and you notice a lot of details in it because you've gotten used to a simpler world. So there's actually a sensitivity-enhancing effect (Leeson 2002: 44).

Le Meur explains how an interactive medium enhances the ideas about to perceive and moreover to exist as:

> But the ultimate aim of any artist, whether using interactive technologies or more "traditional" materials, remains to galvanize the viewer, to make contact, to be in relationship with the viewer. By communicating ideas, emotions, sensations, etc., in distinctive ways, the artwork, and so the artist, aims to influence the viewer. Thus it is always the transformation of the viewer that matters. Acting on an artwork becomes interesting only insofar as it allows one to act indirectly on oneself, thanks to the action of feedback, a reciprocal exchange of thought, allowing a change in one's way of acting and seeing—one's way of being in the world (Le Meur 2002: 204-209).

Osmose is one of the first instances of VR as art. The project aims to change accustomed perceptions of reality and leads to altered states of consciousness with a new set of original aesthetic rules.

One of the most important key aspects of Osmose is the style of existence in the enveloping environment with full-body immersion, which is a kind of floating, most intimate to the sense of being. As a navigation tool, user interface built around balance and breath. Breathe in, rise up; breathe out, sink down; lean back, drift backward; lean left, drift left ward which emphasize the being as a fundamental act of to be alive. It forms a new way of the getting out of traditional restrictions of interface.

Jones interpreted Davies's VR based work "Osmose", it's utilization of the time and space concepts and how this affects the perception of reality through extended immersive quality of the work and interaction:

> "The interval of our immersion in *Osmose* provides a perspective that is time-based as well as spatial; this perspective constantly perturbs our usual sense of locus in space and time. This is a new kind of aesthetic experience where time plays an important role in our view of the work.
>
> In the audience's contemplation of a painting, the durational element becomes little more than a slightly extended present, whereas involvement in VR, new-media or video work forces one to spend some time with the work simply to gain any idea of it at all. Being captured by the work becomes another factor in the immersion Duration as a dimension of an artwork allows the producer of the work to introduce a series of ideas, or a flow and mutation of one idea, which is not available in most painting or sculpture. Time allows an audience the luxury of contemplating the work, of exploring possible interpretations, and it allows artists the luxury of extending and developing associations and permutations of ideas. It is this which promotes interaction as much as any "hands on" operability of the computer driven-work (Jones 2000: 125-132).

As an experience far beyond the resident standards, *Osmose* is a remarkable footstep for changing the aesthetics of virtual reality as much as the whole artistic tradition:

> Osmose is an artwork whose status is gradually emerging. Notwithstanding the rather polemic references to kitsch and esotericism, Osmose does represent a signpost in the history of the media, like the films of the Lumiere brothers or the early panoramas, not least because of its aesthetic utilization of new technologies of immersion and illusion (Grau 2003: 193-211).

Jones interpreted the project with related to states of consciousness as:

> ... Point of view no longer operates in its traditional manner; it now alters over time, and our perception of time and space becomes a virtual knowledge, no longer fixed to the Cartesian frame: mutable, always recalculated, determined by our progress through the environment. Consciousness can only follow along, hoping to make the necessary adjusments before we fall out of the world. Our internal center is temporarily dislocated from our external center; suddenly we do not know where we are (Jones 2000: 125-132).

Osmose is about being and awareness of being. It is realized in three dimensional computer generated environment by excessively using the potential of the medium, and challenging

standards of tradition. Char, who is creater of the project, discusses his artistic aims of the project and for the process and an environment relation of VR:

> *Osmose* approaches computer technology as an expressive instrument (not value-free but one whose conventions can potentially be subverted) to access another kind of space, a paradoxically virtual/physical space -that, yes, is entirely of human making, but which, because of its various unique properties, has the potential to act as a site, as a place, where artists can project their visions of the world -so that people might experience another kind of 'being', relatively unbound by everyday cultural assumptions (Davies 1998: 65-74).

In semi-abstract and translucent visual aesthetic of Osmose, ground is ambiguous, and transitions between metamorphic worlds are uncertain. Cartesian notions about spatiality and physical reality such as perspective, figure-ground relationships blurs and swaps to more evocative alternatives. The surreal atmosphere reigns inside close to evoke and inspire rather than define:

> ...that immersive virtual space can be used to convey alternative sensibilities and worldviews, potentially functioning as a perceptually and conceptually invigorating philosophical tool (Davies 2004: 69-104).

Solitude is one of the critical aspects of the project as specially intendent. Sense of sinking in ones own self, being alone emphasized. A position of being, rather than acting. Shifting to another level of consciousness. Distinction unfolds between body and mind. *Osmose* as a project based on exploring the perceptual interplay between self and world, aiming awareness of self:

> ...these works embody a radically alternative approach to immersive virtual space, or what is commonly known as "virtual reality" or "VR". Rather than approaching the medium as a means of escape into some disembodied techno-Utopian fantasy, I see it as a means of return, i.e., of facilitating a temporary release from our habitual perceptions and culturally-biased assumptions about being in the world, to enable us, however momentarily, to perceive ourselves and the world around us freshly (Davies 2004: 69-104).

Conclusion

In two different states, VR offers important contributions to the design environment:

Firstly, as a design tool which makes simulation of reality possible extensively. Capability of having simulation of the nature parallel to the physical reality in terms of object qualities and limitless adjustment possibilities about the relationships and interactions between variety of qualities and systems which are build on these in almost any detail; exploring and modifying characteristics of variety of them in terms of three dimensional perception, form, time and motion, etc. are very massive points VR offers. Thus, gaining knowledge of unity in a systematical way makes possible to synthesize the groups of ideas and concepts.

Secondly, as a medium, innovative and with an amazing capacity of constructing fictious systems without physical constrains. VR can make an evocative effect on Arts in age of digital revolution while the need to question all the methods of perceiving, comprehensing and performing grows. VR is such a medium that alternative and creative fictions can come alive; consciousness and existence interrogated in a new way and new avantgarde horizons can be contemplated.

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EXPLORING COMMUNICATION AS AN "ACTING" DIMENSION OF PROJECT PROFESSIONALS' ACTION

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Abstract

Project and design managers undoubtedly need to communicate with a range of actors in designing and executing projects. The dominant approach to communication applied in design and project management seems to be based on the postulates of the sender-receiver model developed by cyberneticians at the turn of the twentieth century.

However, the anthropological underpinnings of this model appear to be incapable of explaining the complexity of the relationships that develop between different project professionals. Although we see signs of the emergence of new approaches to communication, we argue that the current understanding of communication within design projects can be taken a step further by tackling contemporary practical philosophy. Not only will this allow us to propose an anthropological alternative to the informational focus of the cybernetic model but, through the "acting" concept (Arendt 1998), it also allows for the emergence of an original conception of project professionals' communications—one in which the communication engaged in by actors through the design situation constitutes an end in itself.

Methodologically speaking, we investigate project communications from a phenomenological perspective and focus on how managers perceive and describe their experience of communication. Following the recording and transcription of a series of semi-structured interviews, an initial analysis enables us to briefly illustrate the "acting" dimension of project professionals' communications.

Introduction

All projects—architectural, engineering, new product development, information systems implementation, international development or community projects—create groupings of diverse actors. These actors must exchange all kinds of information in order to conceptualize and execute the object[2] and manage resources. In this sense, talking about a project context also entails talking about the communication phenomenon that is inherent in it. As design becomes more and more complex and as project professionals become increasingly involved in the design process, its communicational

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[2] "Object" is used in the broadest sense of the word, designating a product, service, facility, concept, etc.

character becomes obvious. In the project management literature, the figure of the project manager is expanding and becoming more complicated. Thus the project manager, who must face "non-administrative" issues and become involved in creative activities, acts as a "sense-maker" and a "web-weaver" (Simon 2006) and is literally seen as a designer (Williams 2005). In practice, project managers are undeniably confronted with design situations—managing architecture or new product development projects inserts managers into the design field. This similarity between designer and manager is acknowledged by Borja De Mozota (2002), who classifies both design and management into problem resolution, innovative, systemic and coordinating activities. In the same way that the project management profession seems to be linked to the creative realm, design management can hardly escape the constraints imposed by the business environment.

At this point, traditional frontiers between professional fields tend to blur. Whether one is active in design management or project management, one has a common interest in the project and the project situation. Somehow, we are all engaged in "project research." In order to release all the energy inherent in project professionals' activities, there seems to be "a need to create a unifying platform for design as a field rather than a profession, to link the different professions together and improve their mutual interaction" (Stockholm 2005: 55). What is true of professionals may also be true of researchers who share an interest in project studies. Thus, interaction and collaboration between the project and design management communities appears to be particularly relevant. And this is precisely what we will claim here. We think that if project communication is to be understood and studied, it can best be done by fostering interaction among project disciplines and by stimulating exchanges and debates between them.

Our journey will proceed as follows. First, (1) by examining several studies related to design and project management fields, we will address what we think forms the dominant approach to the communication phenomenon. Based on this short review, we will be able to consider the basic assumptions underlying this mainstream vision of communication. From there, it would appear appropriate to propose (2) a specific vision for project professionals (architects, designers, managers, etc.) based on several reference points from the work of Arendt (1998). Thus, we consider that one way of pushing the envelope still further is to directly address the underlying question of the actor—that is to say, an anthropological question. Not only do current studies not explicitly propose an actor figure to understand communication but—as we will show in (2)—they do not distinguish the consequences of a particular perspective for this figure. Finally, (3) our theoretical remarks will be illustrated based on an exploratory field study. This will enable us to demonstrate the relevance of our theoretical framework, on the one hand, and to propose avenues, pathways and openings that could allow us to reconceptualize communication, on the other.

Depicting an informational vision of project communication: When project actors become informational subjects

The vision of communication within the various disciplines related to projects is largely associated with an informational approach. Within the field of management in particular, many authors have presented this kind of vision (Cleland & Ireland 2002; Mintzberg 1980; PMI 2004). This view is also widely circulated through the normative approaches proposed by the dominant professional organizations such as the Project Management Institute (PMI) and the International Project Management Association (IPMA). The publication of such collections as the *Guide to the Project Management Body of Knowledge* (PMI 2004) clearly reveals this approach. The frame of reference for the PMBOK (PMI 2004) essentially presents communication as a critical link between project actors. Thus, we read the following:

> Communicating involves the exchange of information. The sender is responsible for making the information clear, unambiguous, and complete so that the receiver can receive it correctly. The receiver is responsible for making sure that the information is received in its entirety and understood correctly (PMI 2004: 24).

Most of the classic works on project management also evidence this particularly homogeneous vision of communication, where information constitutes the only link between actors. Thus, summarizing the key elements of communication, Cleland and Ireland (2002) suggest that:

> Communication is a two-way process: between the sender and the receiver(s). Taken in this light, the receiver should not be considered a passive recipient but rather a destination that is likely to have a purpose in getting the message and to be influenced by perceptions and beliefs of those people who send the message. [...] *Communication is the process by which information is exchanged between senders and receivers* through a common system of symbols (Cleland & Ireland 2002: 4B5-500, emphasis added).

Thus, if we consider the model of the manager's role proposed by Mintzberg (19B0) and represented in Figure 1, it seems that much less effort has been devoted to an in-depth understanding of the left-hand side of this model. This situation is quite paradoxical since—according to Mintzberg himself—the interpersonal roles played by managers[3] allow information to be gathered that is essential for decision making.

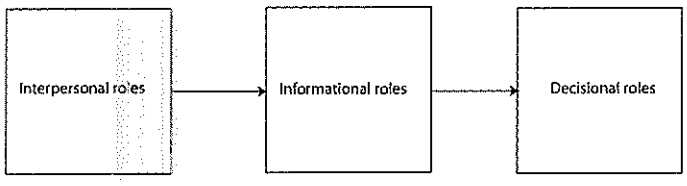


Figure 1. Managers' roles. Adapted from Mintzberg (1980).

Although Mintzberg mentions the importance of interpersonal relations, the understanding of such relationships is often reduced to a purely mechanical necessity. The logic is simple: without developing interpersonal relations, a manager cannot acquire relevant information and thus make the *right* decisions. Following this vision of communication, it appears that if one multiplies the numbers of actors, the risk is that problematic situations will become even more intricate and that the complexity inherent in task coordination and information circulation will balloon out of control. Information systems and project software are therefore conceived as tools meant to create more *efficient* communications by supporting exchanges and multiplying channels and interfaces that allow information coding and decoding (Chiu 2002). In considering the manager as an information processing center, Mintzberg's work seems to define the bounds of the theoretical edifice that is the body of work arising out of the classical school of project management.

These management-oriented studies are quite close to another way of conceptualizing communication—this one anchored in what we might call a cognitivist perspective. This stream of research has attracted the attention of many scholars in the design field (Busby 2001; Dong 2005; Stempfle & Badke-Schaub 2002). According to this view, communication has to do with how information is processed. For example, Stempfle and Badke-Schaub (2002) frame every communication act in a generic model composed of basic cognitive operations. Communication represents either the content of a problem or the process by which design activities are structured and organized. Busby's (2001) position is typical of this view. Instead of talking about design collaboration or communication, his approach stipulates that errors in project activities come from failures to meet the requirements of distributed cognition. This model is essentially another way of conceptualizing the need for multiple actors to interact if one is to gain a full appreciation of a problem.

Of course, every actor involved in a project is different, and each of them perceives and interprets what is going on in a specific context in their own way (Dorst & Cross 2001). This might, in fact, be the main reason why we need to improve our understanding of communication and deliberation in project situations. Nevertheless, whether we examine Mintzberg's work in management or Busby's model of distributed cognition, we reach the same conclusion. In fact, in considering some studies in project management (Cleland & Ireland 2000; PMI 2004) or design (Busby 2001; Chiu 2002; Stempfle & Badke-Schaub 2002), one cannot but note that the major emphasis is usually on actors' interactions. Given that this shows the importance of actors' participation or interaction with one another, is it not unfortunate that communication comes to be strictly considered as "articles of knowledge," "bits of processing need"

[3] "By "manager," Mintzberg means all individuals who have responsibility for organizations or parts of organizations. Thus, this definition includes people who have such titles as president, team leader or dean, as well as those who have titles like project manager or design manager.

(Busby 2001) or an information processing system (Mintzberg 1980)? In each of the works discussed above, communication is seen as relating to how information is transmitted, and how it can be transmitted and processed more accurately. We clearly see a desire to eliminate ambiguities and adapt project elements to the requirements of error-free communication. The exchange of information results in the unequivocal application of what is inferred, as if communications within a project could be explained by the construction of a logical system appropriate to an artificial language. The prescriptions to which such a logical system, inspired by cyberneticians[4] and logicians, is subject cannot be transferred to a natural language for the simple reason that one can never be unambiguously certain of the intentions of the person who transmitted—or did not transmit—a message. And that is where the above-mentioned models appear doubly inadequate. Not only are receivers so to speak condemned to interpret the message received—because they do not have effective or infallible means of controlling its meaning—but they must also resign themselves to not being able to control the information that others transmit to them. For these models to show evidence of internal coherence, and for the analogy of communication as information to truly constitute a logical system, each element must have only a single meaning that is perfectly defined and never varies according to the context or the actors involved. In reality, though, the communication inherent in projects does not make use of a formalized language, such as the informational models of communication posit, but the ordinary language of social communication, which is riddled with ambiguities and with possibilities that doom to failure any attempt to formalize exchanges.

As many people have already pointed out, the cybernetic model is very poorly adapted to understanding the communication phenomenon (Lafontaine 2004; Mucchielli 2000). In fact, the theoretical foundations underlying these ways of understanding communication clearly propose a logic of desubjectivization of actors. From this point of view, we are seeing the erasure of the boundary between the actor and the system (technical, informational, technological), where the relationships that actors experience with each other seem to disappear in favor of purely informational considerations. Of course, we are aware that the informational view of communication cannot be considered as representing an exhaustive review of the literature concerning project communications. Indeed, some emerging perspectives are particularly noteworthy. This is the case, for example, with the growing number of studies that manage to distance the information vision of communications by insisting on the importance of deliberation, post-project discussions, power games, and the uncertainty inherent in communications and that propose to anchor design or management communications in other perspectives such as hermeneutics (Snodgrass & Coyne 1997), narrative sharing (Boudès & Christian 2000), organization as discussion spaces (Detchessahar 2002) and rhetoric (Miller 1990; Parkin 1996).

When we look closer, we recognize that the developments during the last ten years of research, rather than focusing on the "information" aspect of communications, have been far more interested in the "actor" aspect. Insofar as all of this work emphasizes the key role played by the communication phenomenon in project situations, the alternative that we propose is situated within these recent frameworks—we believe it to be of major interest as much for the design management community as for the project management community. Yes, actors actually participate in a living network of interactions and communications without which the project could not be completed. Yes, communication represents some kind of phenomenon within which actors can understand each other, share common meaning, exchange information, create a sense of a complex situation and act together in an organized way. Now, from the perspective of more accurate benchmarking of the communication phenomenon, it would be very relevant to *rehabilitate the relationship between words and the people who speak them.*

To sum up, what we have seen in this section is that the model of project communications is very much inspired by a set of theoretical presuppositions developed during the postwar period in the wave of enthusiasm for cybernetics. The fields of management and design, despite their considerable theoretical diversity, share a certain point of contact with the cybernetic vision. If a particular model of communications gives rise to a

[4] For a summary of the contribution cybernetics has made to communication theories, see Mucchielli (2000) and Mucchielli and Noy (2004).

particular concept of project actors, would it not be possible to reconceptualize the model of communication—in a sort of reverse movement to what had been done before—starting on the basis of a different concept of the actor? It is in this sense that the *focus on the actor* appears to us to be crucial and that is where Arendt's (1998) work is of interest. This author's writings will permit us not only to propose an anthropological alternative to the vision proposed by the informational model of project communication—a richer alternative that is more respectful of human complexity and dignity—but also to create a framework for analyzing our data.

Communication as acting

In her work *The Human Condition*, Arendt (1998) distinguishes between two different kinds of action: *making* and *acting*. The category of *making* targets a goal or a result that is external to the agent performing the action—it is, so to speak, a manufacturing activity. From this perspective, where the project is external to the agent, and where the product is considered solely as an end external to the activity that nevertheless gives rise to it, the making of a project is viewed within the logic of end and means, that is, within an instrumental logic of action or, in other words, an informational logic of communication.

Conversely, although *making* is an activity that has no consequences for the agent, *acting* contains its own end within itself. What does this mean? If we say that acting does not produce anything that is external to the agent who performs the act, we imply that the product of the act is the agent himself or herself. If acting is its own end, this end is the acting human being. The object that is produced is the actor himself or herself who is *capable* of acting properly. Transposed to the project context, we can see that acting, as described by Arendt (1998), does not target solely the creation or achievement of a technical object, but also the transformation of the actors who take part. It is precisely this dimension of action that communication, as conceptualized by the perspectives presented above, seems to neglect. In fact, according to Arendt, agents reveal themselves by their actions, but also by their words. In words and actions, human beings are able to *communicate* and *distinguish themselves*. Thus, communication and self-distinction refer equally to actions and words. Words are indissociable from actions, or rather, words are actions. Thus, saying something or communicating something is a way of acting. By communicating, exchanging with other people, a man "identifies himself as the actor, announcing what he does, has done, and intends to do" (Arendt 1998: 179).

The transposition of this approach to the analysis of communication in a project context appears particularly interesting and relevant. Thus, we find within the project team something more than the task of executing the project as such. This is not a matter of questioning the entire value of the informational logic of communication, but of recognizing that communication contains another dimension that is not the object of the project as such, inasmuch as the actors who participate in it reveal themselves. "This disclosure of 'who' in contradistinction to 'what' somebody is [...] is implicit in everything somebody **says** and **does**" (Arendt 1998: 179, emphasis added).

Thus, it is on the basis of the anthropology that characterizes the work of Arendt (1998) and by focusing primarily on the "acting" dimension she developed that we propose to formulate a new understanding of the communications among different project professionals.[5] This work therefore constitutes a first effort at illustrating the presence of acting within the communications that actors engage in with each other. In the longer term, the idea that resides at the core of this research project involves structuring the acting that characterizes project professionals' work by using the communicative acts they engage in as the foundation stone. In other words, what we are proposing in this paper is that by approaching the communication phenomenon as it is experienced by project actors, we can lay the groundwork for a response that will make it possible to (re)structure the *acting* space of project professionals.

Design of research protocol

The ideas presented here are based on the completion of three interviews investigating the meaning that project professionals

[5] In this sense, we support a conception of actors as "projecting beings," as proposed by Bousbaci and Findeli (2005), whose work explains the necessity of rehabilitating the ethical framework in order to better grasp the concept of project.

attribute to their various experiences with the exchange of information, interactions and communications with other project actors. All three professionals (architect, engineer and computer scientist) consider themselves to be managers and are involved in all the processes inherent in project design and management. The goal of the interviews was to construct case studies concerning these professionals' personal practices in the area of communication. In this sense, the cases are based on the meaning spontaneously expressed by professionals explaining their ideas concerning the communications that were established between themselves and the other participants during various project situations. These individual interviews, which lasted from one and one-half to three hours, were all conducted using the same semi-structured questionnaire. This approach enabled us to generate a considerable amount of information regarding these professionals' personal perceptions of the phenomenon in question.

The interviews were recorded and transcribed in text form and then analyzed with Atlas.ti software. By making a first coding effort which we can describe, using Paillé and Mucchielli's (2005) terminology, as transposition-rearrangement, all of our transcriptions resulted in an enhancement of the initial data, that is, an initial reconceptualization of acting, as approached on the basis of communications between project professionals. The approach we used testifies to a phenomenological attitude toward the people interviewed and refers to certain work from the field of psychology, such as that of Moustaka (1994) and Deschamps (1993). In other words, the contents of the interviews make it possible to multiply—albeit to a limited extent for the time being—what we might call the effective variations in the communication phenomenon, following Merleau-Ponty (1975). Based on these data, inferences can be proposed to identify certain characteristics that emerge from the conversations with these professionals. By applying this method to our three interviews, we were able to (1) compare the respondents' remarks, (2) undertake an amalgamation process based on the emergence of certain overarching themes, and (3) undertake an overall reflection process based on all the data gathered.

With these testimonies on the meaning of communication as our starting point, the objective of our analysis was to determine whether acting in a project situation presents any conceptual validity. In other words, is it possible or thinkable to illustrate in some way a kind of acting that is specific to project situations by considering the experiences of a variety of project professionals in their communications with others?

Cues emerging from the data: Acting illustrated through the meanings of communication

An examination of our data enabled us to tease out a succession of themes that led us to a better understanding of the meaning of communications among managers and other project actors. Let us first mention that the professionals we interviewed perceive projects as some kind of discussion space in which the quality of the emotional atmosphere is of paramount importance. It is within this space that professionals exchange the information necessary for designing or managing projects. An in-depth examination reveals that the crucial points for the facilitation of these spaces relate to notions such as the quality of the relationships among actors, the trust they feel for each other, respect, commitment, initiative, etc. Here is one example:

> I think that project management depends on relationships above all to achieve the project. If you haven't developed good relationships, it's going to be difficult to achieve the project's goals. And you may have more commitment from people when you establish those kinds of relationships and when things are getting tough, and you ask people "Can you guys do overtime?" or "I know it's a long weekend, but can you work? Because I think we really need to do this." And if you can do that, people will say yes, even if they have plans, they'll say "OK, I understand," and they'll do it. I think they'll do it for the project and they'll do it for you at the same time. Because they'll feel it's not just technical, it's the people as well. There's a difference. Anyway, that's what I think (Project Manager 1).

In fact, our examination of the interviews clearly shows that these managers in charge of a variety of design projects perceive themselves as special actors within the projects. They are the ones who are responsible for building links between the different actors. This responsibility that managers assign themselves reveals that they are adopting the role of facilitator or animator. By taking on this responsibility, managers show that they are aware of acting in a dimension that is no longer aligned

only with the completion of the project; in other words, the aim with which, or within which, they are acting no longer seems to be limited to an informational one. In this situation, where the manager is trying to bind the various actors together, the role of animator or facilitator ends up being something more:

> But the coaching I've been doing with my people for several years, I now think, it's been several years, that's exactly it: if you have an idea, then get going. [...] but as a human being dealing with these people, I also feel responsible for influencing them or trying to coach them... (Project Manager 1).

Collective action is no longer merely the guarantee for achievement of the project's goal. It also concerns the project *subjects*, who throw themselves into their attempt to meet the specific needs of a project. The project subjects are quite simply the people who, directly or indirectly, participate in it. By participating, these people are invited to create, design and compose a new dimension of the project's reality; this imperative corresponds to the invitation that Midler (1995) issued to reinvest in the social logic of innovation. It is easy to detect the empathy the managers express toward both their customers and their team members. At any rate, this attitude was very clear in the three project managers we met with.

> Then I quickly encouraged him to be a project leader. Because he's a good communicator, because he looks for solutions, because he's got what it takes. Then he was completely ... he was really surprised ... it was as if it was me who made him a project leader, and I think he'd never thought he could do that in his life. [...] I asked him if he could handle a project for me where there were a lot of things to do. [...] And he did a super job. And then afterwards, I took him along and we created Carbone 14 [...] and it was like ... I was the one who encouraged him to take on a broader, a larger role [...] but I want to say, in relation to the trust I had in him, letting him ... especially because I didn't feel ... for me, it just went without saying, you see? It's like ... you see different players and when you see one who's really good, you put him on your team, then you have him play a key role on your team. For you, it's just natural, you saw him. I saw him in action, it's as if **I'd seen something inside him that he himself wasn't aware of.** [...] I helped him with all the things he found most difficult, giving him tips, but that was a very minor aspect compared to all the rest that he had himself (Project Manager 3).

To this end, an experienced manager who recognizes a certain capacity in a person may use a particular act to invite this person to express what he or she thinks: that is, to act, to reveal himself or herself, to communicate, to take an initiative. The project actor—the "who" of the project actor—reveals himself or herself to the others by taking the initiative. By building different links, managers definitely strive to promote this revelation—in other words, taking initiative—in the people they are managing.

> Yes, we set the table, we bring up topics, there are people who will take the initiative to express themselves on how they see things or the orientations they prefer, but at some point, in the middle of the discussion, you've got to get in there and ask, "Mr. X or Ms. Y, what do you think?" You need to seek out people's opinions. [...] The person needs to have the feeling that he or she is contributing to the advancement of the team and, at the same time, that the experience has been positive, that it was gratifying in some way, and that no one broke in at the end of his or her comments to say "What a moron you are!" (Project Manager 3).

By relating the discussion space to managers' attitudes toward other actors, we can say that what emerges from the communications among these people is an empathetic relationship where one person looks after the other, expresses concern for him or her or pays special attention. Briefly, managers express a kind of solicitude toward the other project actors. It is evoked in different ways: the manager helps his or her colleagues, is one with the client, looks after them.

> It was positive, it was ... what came out was that people appreciated that ... that I had the impression that ... I cared for them. That really, when I talked to people, I was authentic (Project Manager 1).

What must be emphasized here is that the application of these kinds of roles and/or responsibilities allows one to open up new lines of thought regarding acts of communication in a project

context—ones that are not based on making or on a logic of information transfer, but rather on what we have called the "acting" dimension of human communications. It is noteworthy that in the relationships that managers maintain with other actors when they work together, we can say that acts of communication move simultaneously in opposite directions: toward others and toward oneself. In fact, there seems to be no difference between the manager that one is and the person that one is or is becoming. It appears that any act performed by the manager is indissociable from him or her—that a communication is, so to speak, imputed to him or her. It is through their actions when communicating with others that managers get in touch with themselves. In this way, we begin to see that communications, which make up the daily lives of managers, cannot be reduced to a purely informational dimension. Indeed, it is through their communications—through the communicative actions they perform—that managers build connections with other people and create discussion spaces in which they engage in some kind of *ethical project*.

> I mean that what I most want to improve are the factors that I would say are related to motivation, putting myself in situations where I will feel good and perform well. So my targets aren't ... maybe what I'm saying isn't very clear [...] they're not concrete objectives in terms of work, for example, go out and get two big projects or make sure that a project will be extremely profitable, and all that. Yes, I've always had those kinds of objectives and I still do, but I would say that in terms of objectives that are more ... [...] in my hidden agenda, I'm not really career-oriented, but I want to feel good at work. No, I want to feel good in my life. [...] What I'm really aiming for is balance... (Project Manager 2).

Based on this examination of the meaning of the communications underlying the work of different project professionals, it is possible to focus on a principle that is neglected by the informational view of communications. In the relationships that actors establish among themselves, communication does not produce only an end that is external to the actors. Communication also creates a space in which the actions taken construct the actors themselves. Thus, an external dimension, for example a *technical project*, and an internal dimension, characterized by the actor as a *projecting being*, are bound together by communications. On one hand, we need to denounce the ethical neutrality of a concept of communications in which the interactions among the different actors are embedded in principles of information transfer or processing, which desubjectivize the people who are taking part in the project. On the other hand, we need *to emphasize the reflective capacity of project professionals, who are fully capable of evaluating their reasons for acting, ranking their preferences, assessing the goals they set for themselves, in short, of appreciating and rating the meaning of their actions.* In this way, we can define the outlines of an ethical project, since it is by assessing their own communications, discussions and relationships with others that project professionals become able to appraise themselves in their role as the authors of the different actions whereby they connect with other people.

Conclusion

If indeed project professionals do insert themselves into a network of actors, it appears that it is only by ensuring a certain quality of interaction—by establishing a certain trust among the actors—that they succeed in achieving the key goals of the projects they are managing. To do this, project professionals must, of course, do things and say things—in other words, act. Based on their own testimony, we can see that these professionals manage to generate a higher degree of integration in their communications in larger-scale projects that exceed the bounds of the technical projects that they are carrying out. As the three managers we interviewed emphasized, these considerations include plans for their professional and personal lives. It is clear that the means-end model, which most of the perspectives examined in the first section of this paper reflect, and the anthropological limitations of which we have emphasized, is inadequate to understand the communication phenomenon, that is to say, to fully grasp the wealth of communications in a project situation. In light of this testimony, and of a preliminary summary analysis of how managers talk about their discussions with other people, we see the need to restore a richer framework in order to better understand what the act of communicating means to managers.

Thus, in project situations, it should be possible to point to specific actions, acts or communicative acts that express either making or acting and see how one dimension of action

interacts with the other. We think that in building on this first draft of the acting dimension of communication, two successive avenues for development will prove particularly interesting. The first consists of further pursuing this conception of acting as it is revealed through the meanings that different project professionals assign to their discussions with each other. This first step should result in the concept that we have already emphasized in expressing the need to structure the "acting" space of the project professionals' action. If we continue along this road, the next task that would await us would be to conceptualize how, in everyday design situations, the making and acting dimensions intertwine. At this point in our thought process, we do not believe that an action can be attributable to either making or acting alone. In our opinion, action presents a more complex structure in which we find acting and making together. In other words, we will not find a situation where an action is pure acting or pure making. Thus, if action is nested in a structure in which the making and acting dimensions interact, our work should now be directed to the interpretation of this interface.

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STREET FURNITURE: DISCOURSE OR DISORDER?

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Abstract

Cognitive Sciences and Neurosciences literature on perception helps understand major concepts. Our first part is dedicated to the understanding of three concepts: visual ambiguity, consciousness/implicit/unconsciousness perception and attention, and their application to the perception of three-dimensional objects. In the second part we describe new units that have just been installed in Paris to shelter tram users. Interviews help classify what is actually seen by the public compared to the designers' intentions. In the third part the analysis leads to a critique of the designs and what is actually perceived. And some hints that Cognitive Sciences and Neurosciences could give to designers; and foster conscious perception and understanding through attentional amplification. The conclusion questions designers' responsibility and ethics.

Introduction

Objects and products are all around whether in private or public environments. To be able to perceive these, our eye is constantly in movement and the retina printed by shapes, colours, lights... What do we really see and how does the process happen? With the help of Cognitive Sciences and the research held by Neuroscientists we will try in the first part, to understand what is perception and the importance of consciousness and attention. The second part of our paper is dedicated to an example: tram shelter units recently set up in Paris and specially designed to fit the new environment imagined by urban planners. In the third part the analysis of the interviews of the public will help compare the conclusions we can drive from brain research and what naïve and experts users actually see and understand. And initiate a critique on design. As a conclusion we will open a "big" question without answering it yet: Could such a street furniture help produce order in public environment? Can designers help educate the public in seeing what is to be seen? What tools should they use? What ethic for the product designers?

1. Visual perception

1.1 Visual perception and ambiguity

A common definition of visual perception is "to be able to identify an object thanks to its visual attributes such as colours, shapes, outlines, texture, size, spatial orientation and movement if any". Neuroscientists have discovered that specific visual attributes activate different areas in the brain and have to be probably synchronised for a proper representation to happen for the viewer. Researchers are still investigating to understand such a complex process that involves linkage, linkage that like a familiar route would be easily recalled from our long term-memory when needed be. This statement would mean that perception – on a biological level - is not really a given sensation happening as a whole like many philosophers used to think it is. Visual perception is in fact a complex and ambiguous process where elements have to be recomposed into a global image. For this paper we will limit ourselves to few ambiguities and question their relevance to product design.

From our own experience we notice that an object is never seen as a whole: some parts (the sides and the back) are hidden, but nevertheless we can understand and recognize this object. "Perceptual recognition of an object demands that visual information about a perceived object matches conceptual information and knowledge about it stored in long-term memory" explain Jeannerod and Jacob (2005). My question is then: what conceptual information one already has for a specific object? When did it formed? As this perception is different from one person to the other how can recognition yet happen? These

queries directly question the design process: how can we perceive a completely new product for which there is nothing stored in our long-term memory? A second ambiguity is that the object is seen with constancy: an object is visually perceived as the same object, although the colour, the shape and the size may appear different in various circumstances like illuminations or distance for example. Daniel Kersten (2004) and his team has specialised in analysing how the visual pathways of the brain transform image information into percepts and action: "best guess and interpretation for the best expected utility or experience" do they assert (p. 297): they suggest that opportunistic learning happens in the rare moments when an object is seen under low ambiguity such as a good lighting, a frontal view, no foreground obstacle. This learning is opposed to bootstrapped learning that happens under condition of high ambiguity, when what is seen does not provide a clear view of the object. This process would explain invariance or object constancy perception (noted by both Kersten (2004) p. 285 and Jacob (2006)), and may inspire designers to work on the various angles the products they design may or will be perceived and understood. A third ambiguity is about the constant solicitation put onto the eye to distinguish between scenes: the background and the object have to be differentiated. Vision demands both to select and to recognize. And all objects cannot be seen at the same time. Could product designers reflect on this problem to enhance the differentiation, and thus propose better and easier recognition, not only of the isolated product itself, but also of the product located in various environments? We will see that problems such as security might be of importance here. This third ambiguity underlines the fact that the viewer has to go back and forth from a mind-to-world (egocentric) vision to a world-to-mind (allocentric) vision: the viewer is sometimes the centre of what he/she sees when it is needed to refer to his/her own memory and to recall percepts, but at the same time the viewer has to compare what is seen in the surroundings.

Egocentric perception Bottom-up stimulus	The visual experience (be it conscious or not) starts with images thrown upon the retina. The viewer is the centre.
Allocentric perception Top-down experience	Attention given to the external world. The computation that transforms perception into representation.

Figure 1. Top-down vs bottom-up stimulus

These comments on ambiguity lead us to the question of the role of consciousness and attention in the visual perception process.

1.2. Implicit/conscious/unconscious perception

It is common experience to all of us to see objects or scenes without memorizing them. We are not able to report any detail of something we have actually perceived. This sounds like an oxymoron: "unaware perception" when the definition of perception is visual awareness. Jacob (2006) proposes two different experiences: "normal subjects may fail to notice large changes in a rich visual scene" and "we are perceptually aware of unattended features of the object", two examples amongst myriads of possibilities of non-conscious, unconscious, implicit, unaware visual perception that several authors have listed in the recent literature. Without trying to be too specific, we need to understand how perception and consciousness can be linked according to Cognitive Sciences and Neurosciences. With the help of recent articles on the subject we suggest a first list of four different aspects of this problem and their explanation.

The first point is subjective versus objective perception: every single scene that we perceive is constantly analyzed by millions of different neurons reaching different parts of our brain, when on our side we see only one world. Cleeremans (2005) suggests that consciousness happens on two levels: a). a non-linear level referring to subjective experience (I experience) and b). a continuum referring to active neurons in a given area of the brain (the third person or objective experience). This would explain the dichotomy between the subjective experiences we commonly have of a united conscious state, and the objective experiences of the brain modular treatment analysed by scientists. The second point is the visual selection: Damasio (1999) explains that consciousness has developed both along human and individual evolution and still develops all through one's lifetime depending on personal experiences. But as he explains there are different unconscious processes in visual perception: if images are formed in our brain but we do not care of (my comment: not attractive enough or not useful?); or if neuronal configurations are never transformed into images; or in case of automatic or non-conscious perception (different from unconscious perception) that prevent us from being disturbed by unnecessary details. If everything around us would stimulate

our attention we would become confused and captivated by useless details. We can think of many examples like walking in the street, driving... when we need to concentrate on single objectives to simply stay alive! The brain has a major role in survival. Fred Drestske (2006) in a long article titled "Perception without awareness" explains "we do not notice some of the things we are consciously aware of"..."it shows that conscious experiences of the world are sometimes richer, more variegated, more textured, than the judgements one ends up making in their basis". Dretske suggests this inability to retain information is nevertheless consciously registered at the perception level. He calls this phenomenon "amnesia". Amnesia or unconsciousness? Neuroscientists have another way of analysing such experiences and refer to adaptation and unconscious treatment. Naccache and al. (2005) describe experiences that show how our brain may be conscious when we cannot report any perception and that action is then monitored without consciousness. Recent research (Serences & Yantis 2006) has helped understand such a phenomenon: sensory properties would happen in earlier areas of occipital cortex regions whereas behavioural relevance, subjective value and motor intention happen in later areas. Implicit perception (perception without reporting) would be a process of elementary adaptation rather than a complex cognitive unconscious treatment (Cleeremans 2006). Would this elementary adaptation be an ecologically relevant perception? Ahissar and Hochstein (2004) have developed this idea in an important article called "The Reverse Hierarchy Theory of Visual Perceptual Learning". Classical behavioural theories used to state that only simple features would come first, but Ahissar and Hoschtein's conclusion drives that in a scene "features will pop out if they form an ecologically relevant property". Using Stimulus Brain Detection Tests they assert that these ecologically relevant properties might be simple like colours or size, but can also be as complex as depth, shape, or a human face. Reversely if features are not ecologically relevant they will require longer scrutiny to access lower levels in the brain. The authors worked with four different performers, from naïve to expert. The expert performers having a long experience of the task they must accomplish, have immediate and holistic perception. They have learned to prune "uninformative inputs for the trained tasks. Performance can thus once again depend on higher more generalizing unit". So perception and goals go in pair: one does not bother to access lower levels in perception for irrelevant details. This point is of highly interest for designers. Without oversimplifying the above conclusion, we can reflect on the importance to differentiate between naïve and expert users as they perceive objects and details differently. The second interesting point is to understand what an ecologically relevant design detail would be for a specific product and the importance of duration for a proper perception. This leads to the question of attention and memory linked to perception and consciousness.

1.3. Perception, attention and retention

Many authors in Cognitive Sciences have underlined the importance of the intentional stimulus for perception to be memorized. They question the selective attention when competing for coherence among objects in a visual scene. In an article debating the links between attention and conscious/unconscious perception Naccache & al.(2002) suggest that "at any given time many modular cerebral networks are active in parallel and process information in an unconscious manner". They continue: "information becomes conscious, however, if the corresponding neural population is mobilized by top-down attentional amplification into a self contained brain-scale state of coherent activity." This top-down attentional amplification (see Fig. 1) "is the mechanism by which modular processes can be temporarily mobilized and made available to the global workplace (in the brain) and therefore to consciousness" (Dehaene 2001). We find here a noteworthy question on ways of fostering such "top-down attentional amplification". An on-going perception is not sufficient to reach a conscious state of mind. The perception has to be amplified and held during enough time (in milliseconds) to become accessible to what the authors call the workplace in the brain. A "dynamic mobilization" has to happen for a performance to become conscious. The sequence of perception, attention and retention is mandatory for learning (see Ahivar & Hochstein 2004) and cannot happen in any other sequence. Again an interesting point for designers: how to create and enhance this attentional amplification? We will see, with the example we develop, how ecologically relevant details are not always sufficient to create the attentional amplification.

In the first part of this paper we have raised several questions about perception as researched by Cognitive Scientists. We wish to apply the main conclusions as summarized in Fig. 2 to

Street Furniture when perceived by users, and question when and how designers' work is perceived.

Perception and Ambiguity	Perception and Consciousness	Perception and Attention
-Visual information -Long term memory -Egocentric/ Allocentric	-Visual selection and Adaptation -Subjective/objective information -Ecologically relevant feature	-Attentional Amplification -Right sequence -Duration

Figure 2 - Cognitive Sciences and Perception - some conclusions

2. Street furniture and design: order or disorder?

Most French street furniture companies commission product designers, amongst which some are as famous as Philippe Starck, Sylvain Dubuisson, Jean-Michel Willmotte or Martin Székély. It is common practise for a Town or Local Council to ask for specially designed street furniture. Urban planners usually write the briefs with specifics on local environment, security, maintenance, and sustainability. The briefs are complex and restricting, not to forget the demand for a political image and an urban marketing. Street furniture is a powerful signature in the city and politicians never miss a chance to use it as such. Unlike individual products that one might choose with care and investigate prior purchase, users do not select street furniture although they interact and see it on a daily basis. It makes it neutral for a research project.

The furniture we decided to research on has been recently set up along the new tramway line that opened on December 16th 2006 in Paris. This new tramway in one of the many means a Parisian may use freely (one single ticket) to go around the city and suburbs for work and/or leisure. Paris has a long time history in street furniture and designers like Hector Guimard in the 1900s is only one in a long list. For this specific study we will not analyse the controversial debate of trying to cut down city car traffic or the links between cars and the tramway. On the other hand, we will analyse the tram stops (see pictures A and B) as a unit gathering several products: shelter, signage, seats and benches, waste bin, lighting, posters, all specially designed by Jean-Michel Wilmotte et Arnaud de Bussière. This shelter as a unit is an organized micro space, an order of various functions to help, protect, direct and welcome users. On a macro point of view, these tram stops are identical signposts all along the 17 stations and 14km so far - the line should go all around the city. They are one of the different elements of a special landscape for a new area, others being freshly designed gardens and young trees, new poles and lightings, pieces of art and the tram-track itself, hidden by fresh green lawns. They have been designed to give a visual unity to different districts in Paris, and coherence to different types of architecture and urban plans. It is also a sign of modernity the Mayor is very proud of.



Picture A, B. Paris Tram Shelter

In order to apply the conclusions on perception we developed in part 1, we decided to consult the users. The following is the synthesis of the ten most interesting interviews. All interviews happened onsite with a three-dimensional "real" perception, as to avoid the distortion of a two-dimensional image or photograph. Users are of various age and social origins. Eight of them are "experts". The two others are "naïve" tourists. We define the expert user as someone who navigates daily in public transport, has a monthly or yearly pass, and knows his/her way around. He/she has personal preferences and ideas in terms of comfort, time saving strategies, technical incident management and various transport worries. As to refer to part 1, they have trained themselves to go around Paris in public transport, and have a holistic and immediate perception for the specific task.

Although we stayed as neutral as possible, not putting words in people's mouth and never suggesting any answer, we are

aware that being interviewed by a stranger is not the best position to spontaneously express what you see and think. An instrument to scientifically evaluate object perception is still to be invented. We must insist that these interviews are a mere help to understand what users did perceive on a general basis. They cannot in any way be compared to the experiences held by the authors we quoted in the first part.

Our introduction sentence is not a question but an explanation of the inquiry. All users immediately comment on comfort and discomfort, except for two who mention the spacious environment. It is their main preoccupation, whatever age and gender. As the interviews are happening in winter, they all complain about the wind blowing through and notice that no screen has been designed to stop either wind or rain on three of the four sides of the shelter: first person comment and direct visual perception. As this tramway is the first one in Paris in 75 years, everything looks new to the traveller and the main focus is on the tramway itself, new technique, new interior design and decoration, new route, new way of mixing with cars and pedestrians. Hardly anyone (1 out of 10) has identified the shelter as such. To the users we interview, their position, as waiting for the next tram, is the real thing. It seems the furniture is almost a non-experience, although brand new and never seen to them; and designed by famous designers. The spontaneous comments tend to prove that users see first what is "ecologically" relevant, what we could call the "Parisian survival"! And ignore what is not.

During the interviews we notice that expert users (7 out of 8 interviewees) compare tram stops to bus stops (see picture C) leading to interesting observations in terms of perception: "'we' are more protected in the bus shelters as they put lateral screens". This user identifies herself as part of the "bus/tram shelter users group". This spontaneous comparison is interesting and reminds the process of neurones linkage as described in part 1: the bus shelter - although a complex shape - is a reference for the expert user, a percept. The next comments are all about general likes and dislikes using imprecise wording: "I like the decoration", "it is very nice specially at night with the colours" "I do not like what is stiff, it should be more welcoming" "I like when it is modern". No one can identify a precise object or detail to justify his or her argument. When asked to have a longer look, four persons can identify and categorise the seats. They compare them with the benches at bus stops or in the metro: comparison is an abstract visualisation. It seems that they can perceive comfort without sitting down, which is again an abstract process of the brain. Having physically sat down on similar seats has taught users how to immediately visually recognize what is good for their body[4]. I remember a lady refusing to sit down on a bench in one of these bus stops after a mere look, arguing that the seating was concave thus non-ergonomic: "and those who made these pretend to be designers!" she added with a critical eye. (See photo B). According to my personal experience I must admit she is right. Some prefer to be seated on wood that is warmer and a sustainable material than on metal. Some prefer benches to keep children closer; some prefer individual seats to be further away from strangers: imagination and projection into virtual positions and interrelations are abstract processes too. Two users comment on litter-bins and declare no one can see them: "they should put a strong sign to catch the eye, look at all the papers on the ground, people cannot even see the bins!" This specific comment is of major interest for the design process according to Cognitive Sciences: although ecologically relevant to them (to be able to throw away litter), the users cannot see the object when no relevant attentional amplification is proposed.



Picture C – Paris bus shelter and bench

More wording and remarks were made on follow-ups. We noticed that many details were implicit for the users: they

[4] To my surprise, no one actually went to sit down and test the seats: seeing was enough

did not consciously notice nor report any detail although they could comment on them when specifically asked. This is typically what Neuroscientists drive from the experiences we described in part 1.2.

For an easier reading the following list is a classified summary of the main comments:

Seats:
- look comfortable, many of them, too small for good seating
- material: wood and metal
- did not notice them (5 persons)
- individual seats vs benches in bus stops
- nice look, good design, ugly
- good location: not in front of maps
- standing-seating features like in the metro

Shelter:
- spacious (4 persons), generous, "classy", good architecture, functional
- protection from the traffic, safe for children
- large window on the city, large view of the coming tram
- good indication of routes and timing
- No protection in windy or rainy weather
- Dull colours cannot be seen from far away, not a good sign
- Fits well in the urban environment

Design of the poles (never spontaneously noticed)
- good idea, cleaner, neater, you have to have the proper view to notice it
- gives indication in long distance where the tram stop is located
- lighting is connected to the electrical poles: good idea, less poles, less visual pollution
- the lines are modern, it is well designed, trendy, same curving for all the equipment: gives visual unity – doesn't like the curves: no reason, useless, makes me think of nearby trees, like palm trees
- Good quality appearance – good and solid materials and structure, material thicker than for bus stop shelters
- too expensive, too luxurious
- attention has been given to details, some details are awful (joints)
- the materials should be more sustainable

The more expert the public transport users, the more useful details they notice in relation to comfort, security, time saving; the more naïve, the more aesthetic details they notice, looking around and taking time – this point having to be confirmed in further investigations and tests.

3. What you see is not what you see

If users do not see most of the details that have been designed at the design stage, the main reason is that seeing is not obvious. It takes experience to recognize something by recalling prior experiences and existing routes in our brain in order to avoid ambiguity. Perceiving is a first person experience - at least at first sight - that provides information. But seeing is also selecting and choosing amongst shapes, colours, lights that constantly come to the eyes. Seeing is to favour what is relevant for the present situation and to adapt for the next action to perform. What is immediately useful will be seen, understood and memorized first. This sequence of perception, consciousness and attention has been described in the first part. Attention is mandatory for the right understanding. And attention will happen if ecologically useful. Attention will also help amplify the perception. Attention happens in duration. We could observe during our interviews all these processes and phenomenon we understood in part 1. When invited to have a closer and longer look, users described more details and briefly analysed their likes and dislikes (too stiff, no natural material...) comparing their "first person" emotions to feelings they have had in other environments like homes or special buildings like airports. Others stayed at "third person" judgments and talked trends and styles.

On the other hand, if rather than public transport user experts we had interviewed design experts - as most readers of my paper likely are - we would have had a radically different perception of this shelter. Design experts would have probably immediately noticed shapes, materials, well designed details, usage errors etc... Thanks to training, education and habits they have a holistic point of view, and within seconds can differentiate and organize their perception. But the non- specialists do not see all these. Press articles all mention the special double curving that Mr Wilmotte and Mr de Bussière designed as "a quote to the historical Paris Street Furniture", a comment actually written in the press release. None of the interviewees could see this

specific detail, even when specifically asked. If we understood well what the Cognitive Sciences instruct, the public actually sees but, if consciousness is not in demand, they cannot report. Is this "implicit" sight good enough for the designers? Wouldn't the client expect an explicit perception? When concerned (like with the cold wind blowing through) or when they are forced to give a longer look, interviewees see more details, but again they see from an individual starting point, "first person comment", according to prior personal experiences, and possibly from emotions. Further down the process they might refer to individual cultural knowledge, as a third person discourse, whereas design experts would always do so. In that sense the persons we interviewed could be called "design naives" although expert users. Nevertheless the two designers of our shelter did not intend this street furniture to be looked at as a piece of art by experts. It was designed – at least at first intention – to satisfy various functions.

Visibility is another intention expressed by the urban planners, the politicians and the designers. But again this intention is not perceived - or hardly - by the public. What is perceived is an experience of comfort (or discomfort), an experience of security (or insecurity). Why do not users notice the specific details the designers designed? Take the example of the bins: they must be seen but they are not. What is the design intention? Designers wanted unity, unity in form, unity in colours and materials, unity with the immediate environment of the shelter. As a consequence of this intention, the bins melt so well with the environment that they become invisible! They do not attract the awareness and nothing in their design catches the attention when we have understood in part 1 that attention is mandatory to consciousness. Same remark for the poles and the overall architecture of the shelters. To design experts' eyes, they are well designed and the lines are evocative. A good journalist could right pages about it. Nevertheless the interviewees could not see anything special, or at least could not report it. The details did not struck their attention and they could not retain any specifics, although being inside the shelter. My question is: could one accept that a design that melts in the environment is relevant? Is the choice of neutral colours not to hurt the eye a good choice? Elegance and refinement are the qualities generally recognized to Jean-Michel Wilmotte's designs and architecture, and it might be one of the reasons the jury chose the designer for this commission. The designers might have privileged style, trend, and decoration to relevant meaning. Too much blending leads to visual confusion. Efforts to order and organize might end up into confusion when the public cannot see what they should see. And to insecurity when perception does not happen.

According to the conclusions of part 1, if the public does not see the designers' intention their attention is not attracted (no attentional amplification), and they did not spend enough time looking (no duration for memorization). Is it not the role of designers to guide the naïve and expert users in their daily routine? Could they help educate them to give attention to objects and select details? Could they help users to appreciate good quality and nicely drawn objects? What can be the designers' tools for such a strategy? According to Cognitive Sciences, a good product should amplify one's attention to help recall or create new routes in the brain. Attractive visual signals would be the solution. Attraction can happen in many ways design wise. Each feature can be attractive to the eye, be it shapes, colours, texture, lighting...; and more subtly, evocation, imagination, emotion, surprise and dissonance, difference and similarity. In one word, design could be a visual discourse that would be perceived with consciousness, and understood through an attentional amplification. And thus educate design naïve perceivers to become design experts and have an immediate and holistic perception. Designers could then participate in giving urban environment more secure structures and orderly perception.

Conclusion

Perception is thus much more complex than what common knowledge reports. The recent discoveries in the brain functions help scrutinize the process of seeing and could guide designers in very practical ways. How to link attention to perception and to consciousness could be one of them. It opens the big door of perception as a citizen: can design convey cultural and informational messages, can it help for political or social order? We have just seen that too much visual discourse can invite to disorder. Could disorder be a good discourse? Magdy Ma (1999), a designer from Hong Kong offers an invitation if not a solution. She reflects on design and ethics and speaks about the designers' responsibility:

Clearly ethical design does not refer to the rigid simplicity, clarity of form that unimaginatively reflect the content, but some unquantified substance that benefits the senses of the audience and the harmony within the human society. The word ethics refers not only to the moral principles and philosophy governing the designing, producing, delivering and receiving of visual messages, but also an ethos (the spirit and belief in this standard) to be shared by all involving parties (the clients, the creators, and the users).

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ARCHITECTURAL AND DESIGN EDUCATION VIS-À-VIS INTEGRATIVE EXPERIENCES: A DISCOURSE IN THE MAKING

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Abstract

Within the design- and architectural discourses, concepts of 'project' and 'interdisciplinarity' have been much debated in recent years. No conceptual closures, however, have been reached neither in ways in which 'project' can be theorized as an object of research and study, nor in ways in which 'interdisciplinarity'—and for that matter any form of systematic and methodical integration of disciplinary knowledges and methods of research— can be understood as a way of configuring the 'project' both as the site of knowledge and as an ideal vehicle of integration. This paper will discuss the theoretical, philosophical and epistemological issues at play in conceptualizing integrative agendas in project-driven educational environments in both architecture and design schools. It will also unpack the terms 'project,' 'integration,' and 'interdisciplinarity' and situate them etymologically, historically, and conceptually. Claims for integration commonly develop along the two axes: integration of theory and practice, and integration of knowledges and methods across disciplinary boundaries. The argument for integration will be supported by scholarly references, institutional recommendations, as well as practical concerns for developing a more adequate design education capable of responding to increasingly interdisciplinary (i.e. integrative) context for all critical design practices in the 21st century.

Introduction

It would not be an exaggeration to claim that 'the future,' more than ever before, 'belongs to the integrators,' as late Dr. Ernest L. Boyer famously declared (Boyer and Mitgang 1996: XIII). The 1996 report Boyer co-authored with Lee Mitgang, titled *Building Community: A New Future for Architecture Education and Practice* (the Carnegie Report), done under the auspices of the Carnegie Foundation for the Advancement of Teaching, was based in his belief that architectural education is the epitome of 'engaged scholarship' — when combined with civic commitment, Boyer believed, such a model of scholarship and education carries a great potential for community engagement and renewal. However, what the study had found at over 100 architecture schools across the United States, was a puzzling juxtaposition of prom-ises and failures, potentials and contradictions, but foremost an alarming discrepancy between architecture's self image and its perception by 'others.' Such discrepancies were most obvious through two general claims that architecture educators, administrators, and students commonly subscribe to: first, that architecture is 'inherently interdisciplinary;' and second, that architectural education is the epitome of liberal arts education, therefore claiming the centrality of architecture to the liberal arts education in the 21st Century. Needless to say, hardly anyone serious in academia today agrees with architecture's claims, and for good reasons: the Carnegie Report found that ar-chitecture students and faculty are often fundamentally isolated —socially, physically and above all intellectually— from the rest of campus life and from other depart-ments. As they report, "one of the most sobering moments of our campus visits oc-curred when we asked a fourth-year student to describe his school's humanities courses. He replied: 'What are humanities?'" (Boyer and Mitgang 1996: 78).

The recommendations of the Carnegie Report were aimed at remedying architecture's complex position within the contemporary academia, by suggesting that architecture programs develop: 1. more liberal curricula that would integrate professional content with liberal education in

more productive ways; 2. more flexible curricula, since flexibility is a necessary precondition for discovering the connectedness of knowledge through, but not limited to, the interdisciplinary work; and 3. more integrative curricula, as 'making connections' (simultaneously between architecture and other design fields; architectural theory and history with design studio; architecture and other academic disciplines; as well as between architecture schools and the community) is "the single most important challenge confronting architecture programs" (Boyer and Mitgang 1996: 85). Today, ten years after the study was completed and results published, most of the fundamental problems and challenges the study had identified still persist. Namely, concepts of integrative teaching and learning in architecture —including interdisciplinarity but not limited to it— are as elusive today as ever before.

The problems Carnegie Report identified are well known to nearly anyone who had experienced architectural education around the globe, either as a student or a teacher. Besides, the recommendations are lucid but extremely politicized, and the Report —whose declared objective was to assist in demystify architecture education— de facto mystified its most significant recommendation: the question of establishing structural relationships between architecture programs and liberal arts education. The puzzling question is not only 'how' would architecture schools implement such recommendations, but much more it is 'why' would they do it? We, thus, must ask: what would be architecture's motivations for building more robust forms of interdisciplinarity, no longer exclusively in relation to types of professional practice, but much more in relation to the wider academic context and particularly to the Humanities?'

Building analogically on Helmut Dubiel's work regarding developments in interdisci-plinary research methodologies vis-à-vis Critical Theory (Dubiel 1985),[1] one can make the case that most interdisciplinary undertakings can roughly be gathered into two groups: first, 'theoretically pressupositionless,' externally generated, multidisciplinary approach; and second, cognitively integrated, interdisciplinary approach initiated through internally generated processes. Dubiel's definition of multidisciplinarity is analogous to Lattuca et al.'s definition of 'synthetic interdisciplinarity' (Lattuca et. al. 2004: 25),[2] an approach that is 'theoretically pressupositionless' precisely because its aim is not to create a theoretical contribution to the field of architecture (or, for that matter, to any design discipline in particular), but to contribute to a more holistic un-derstanding of issues and situations whose complexity exceed the boundaries of a single discipline. Consequently, such undertakings do not attempt adequate integration of the disciplines involved but instead amass 'native' theories, methodologies, and standards of research in hopes, writes Dubiel, that the accumulation of multidisciplinary experiences will generate transdisciplinary perspectives in students as they cognitively develop. Under what kinds of external pressures would architecture schools develop types of synthetic interdisciplinarity, i.e. multidisciplinarity? Most obviously, external pressure in relation to architecture programs in academia can be summed up with what Dubiel calls 'social pressure for [academic] services'.

External pressures: A quest for 'conceptual interdisciplinarity'

As Boyer and Mitgang report, architecture programs are small in size, when compared with other academic units, and also the most expensive in terms of per-student ratio regarding both human and physical resources (Boyer and Mitgang 1996: 9). Studio-based education is by far the most expensive model of education in academia today. Besides, schools of architecture produce little or no research revenue to the university. These circumstances have prompted administrators at many American universities to demand architecture's (and other design programs') participation in interdisciplinary General Education (GenEd) curricula, and the facilitation of interdisciplinary, cross-campus majors commonly classified

[1] Dubiel refers here to developments in interdisciplinary research methodologies vis-à-vis Critical Theory and the Frankfurt School for Social Research (Dubiel 1985: 123-126).

[2] "In synthetic interdisciplinarity," write Lattuca et. al., "instructors combine theories, concepts and perhaps even research methods from different disciplines; but the contributing disciplines remain clearly identifiable, revealing relatively bounded content areas and perhaps distinctive methods of inquiry." (Lattuca et. al. 2004: 25)

as Bachelor of Art degrees (Bas).[3] Such GenEd programs raise cultural awareness around the interpretation of architecture and design as constitutive parts of broader cultural discourses, but they seldom address the design process. At the same time, they increase full-time equivalencies (FTE) and create more reasonable revenue for the university. The most obvious academic benefit of such programs is the emerging interests in integrative curricula through one of the most obvious and historically grounded connections, that between architecture-and-design with humanities-and-sciences.[4] For such GenEd programs to work properly, they are commonly organized around metadisciplinary topics: topical organization enables multidisciplinary faculty to simultaneously teach and also facilitates more effective and integrative communication across academic disciplines. For instance, Connecticut College has recently introduced new interdisciplinary courses designed to integrate the arts and design offerings across campus, and to create an 'integrated design culture.' Interdisciplinary courses such are 'Designing the Body' and 'Topographies and Identity' are meant to explore relationships between design, place, identity, language and memory.[5] University of Minnesota's School of Architecture has also established interdisciplinary courses open to all majors titled 'Ecology, Design, and People' and 'Introduction to the Built Environment.'

Philadelphia University has created the First Year Experience (FYE) program through which all students search for meaningful connections between their departments, the University community, and the city of Philadelphia. Each year, an overarching theme frames the collective work of students and faculty from across the University. In 2004-05, the overall theme —Finding Philadelphia— enabled students to explore the city through the Philadelphia Mural Arts program as a means of focusing on the inter-sections of people, culture, images, architecture, design, and communication. A variety of integrative learning experiences emphasize the civic, cultural and environmental engagement of students as both future professionals and citizens. In parallel, each discipline organizes curricular activities that address city murals from a disciplinary perspective. For example, students in the writing course analyze social and political issues linked to the production of murals in the city; business students study the economic impact of murals on local neighborhoods and communities; architecture, art and design students work with local artists and communities in reading or creating new murals. As an interdisciplinary topic, murals provide a fruitful territory for integration. A similar First Year Experience program was designed at George Mason University (New Century College). The year-long program features discussions, hands-on learning, collaborative assignments, project-centered experiences, and intensive reading and writing. After completing the integrated first-year experience, students choose a major. The first year is divided into four consecutive eight-credit 'learning communities' called units: Community of Learners, The Natural World, The Social World, and Self as Citizen. These and other new GenEd programs and courses provide opportunities for faculty across the fields to collaborate in teaching multidisciplinary and concept-based courses in architecture, design, the arts, humanities, and social sciences.

Through the participation in such GenEd programs, besides offering general architecture and design education to the university at large, some architecture programs simultaneously use the opportunity to offer critical theory and thinking, Cultural Studies, and add a more rigorous integrative training in history and theory to their own majors. Such conceptually-interdisciplinary programs attempt to enable architecture students to emerge as more critical and hopefully reflective practitioners, aware of the connectedness of knowledge across disciplinary divisions. New 'Design Studies' program at the School of Design, at Arizona State University, is an example of such an attempt. At the same university, Renata Hejduk and Prasad Boradkar created the CriticalCorps program that uses critical and cultural theory as a means to understand the social significance of the designed environment and everyday life.

[3] Such students are also called 'non-majors' from architecture's point of view, the so called 'cheap FTEs' (full-time equivalency) that increase enrollment in otherwise 'under-enrolled' architecture programs.

[4] Even though such programs are commonly liberal arts-minded, they simultaneously search for redefined forms of liberal education. In that respect, 'liberal arts' is often replaced with 'First Year Experience' in naming such programs.

[5] An interesting aspect of this program is that each student (including architecture freshmen) also completes an integrative project either as an independent study project, honors thesis, or through a local internship.

Formed in 2004, CriticalCorps was envisioned as a response to the lack of critical theory, cultural theory, and critical thinking courses offered to both beginning and graduate students in the design disciplines within the College of Design.

It is conceptually clear, although sometimes practically opaque, how the above described, externally generated forms of inter and multidisciplinarity benefit both architecture majors and others across the university.

Internal pressures: A quest for interdisciplinarity in architecture and design

What Dubiel calls 'internal pressures' are voices and forces for the redefinition of the discipline that come from within in their search for a renewed disciplinary identity. Cognitively integrated interdisciplinarity is always initiated through an intradisciplinary act of consolidation, and it is commonly marked by a 'travel' of the model theories, methodologies, and standards of research that have become successful paradigms in a specific discipline to other disciplines. Such processes are facilitated by engaging the disciplines not on the grounds of their methodologies but on the grounds on their subject matters (Dubiel 1985: 124). In elaborating further what cognitively integrated interdisciplinarity may mean for architecture, I will now take on two general claims mentioned earlier —namely that architecture is 'inherently interdisciplinary' and that architectural education is the epitome of liberal arts education— and try to situate them in a larger academic context.

If one would ask the faculty in any architecture or design program in the United States whether they (and their students) have been engaged in interdisciplinary work at any stage of their teaching careers, empirical evidence shows that replies would be overwhelmingly positive. Indeed, as the Carnegie study shows, nearly half of interviewed architecture instructors replied that they have been engaged in interdisciplinary work. Moreover, as Lattuca et. al. report, nearly forty percent of all faculty across the academic spectrum claim they have taught interdisciplinary courses; however, the evidence on such interdisciplinary courses and how they affect learning outcomes is inadequate (Lattuca et. al. 2004: 23-48). More importantly, what empirical and anecdotal evidence points to, is that by 'interdisciplinarity' architecture and design faculty commonly assume the appropriation and superficial instrumentalization of 'other' knowledges towards satisfying normative expectations of architectural projects as forms of naturalized interdisciplinary undertakings. History, theory and criticism programs —that nowadays exist in almost all architecture schools but still in just a handful of design programs in the United States— are often successfully practicing forms of 'conceptual interdisciplinarity' (Lattuca et. al. 2004: 26)[6] but the faculty in these programs (the so-called 'non-makers') are seldom allowed to visit design studios, let alone teach them. At the same time, 'others' (i.e. scholars from other academic disciplines) whose work is commonly included in architectural curricula and theory courses, have been strongly marginalized: they are occasionally involved in design studio 'jury,' itself an outdated mode of evaluation. As Beatriz Colomina reports, some notable exceptions are present in, what she calls, the 'elite' schools of architecture (i.e. Princeton University, Columbia University, School of Architecture of The Cooper Union, etc.) where the boundaries between 'makers' and 'non-makers' are softer than elsewhere: "Without exaggerating too much, one can say that, today, practicing architects in the academy for the most part don't build, while some historians and theorists do" (Chadwick 2004: 50). Colomina then provides examples of studio faculty being involved in writing and publishing, and theory faculty having recognized professional practices, but makes no convincing argument that such an environment is conducive to the inclusion of 'other' scholars and academics on equal footing, or that it *de facto* enables substantial collaboration and interdisciplinary work. As inabilities of 'makers' to build, and of 'theorists' to publish, escalate, walls between 'makers' and 'non-makers' in academia are paradoxically growing.

Interdisciplinarity in architectural education, conceptual or not, cannot be separated from the epistemological and political dimensions of architectural knowledge and practice. As Linda Groat and Sherry Ahrentzen (Groat and Ahrentzen 2001) have

[6] "Conceptual interdisciplinarity [...] includes disciplinary perspectives [but] it has no compelling disciplinary focus," argue Lattuca et. al. "Conceptual interdisciplinarity also accommodates poststructural, postmodern, and feminist forms of inquiry, which explicitly critique the disciplines and may contend that all questions require interdisciplinary answers" (Lattuca et. al. 2004: 26).

argued, faculty women, who have been traditionally marginalized as 'non-makers,' are better positioned to take leadership roles in interdisciplinary curricula. Their survey found that 80% of faculty women teach in areas of the curriculum that are related to, but not situated in the design studio, and that specializations where they dominate the curriculum are conducive to forms of collaboration with other disciplines (Groat and Ahrentzen 2001: 246). In other words, they claim that a majority of faculty women already practice both teaching and research in conceptually-interdisciplinary modes. Meanwhile, Groat and Ahrentzen argued that design studio epitomizes some of the 'most hallowed traditions' of architectural education where interdisciplinary modes of thinking have been reduced to a degree of superficiality that asks for an urgent and thorough reconsiderations of design studio's role in architectural education. One of the reasons for such a tradition is perhaps in the fact that, as Necdet Teymur suggests, design studio is commonly viewed as a 'poor replica of an architectural office' (Teymur 1992: 36) overwhelmingly assigned, teaching-wise, to the practicing 'men of talent.'

Considering interdisciplinarity vis-à-vis design studio

Despite the fact that there is neither a conceptual closure on what interdisciplinarity is, nor an overarching theory of interdisciplinarity, there are currently two different ways academia frames it: either as process-oriented or as outcome-oriented. William Newell of the Association for Integrative Studies (AIS) at the Miami University in Ohio, defined interdisciplinarity as a "process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single disciplinary perspective or profession" (Klein and Newell 1982: 1). In Newell's view, interdisciplinarity must be defined as a problem-based integration necessary for the resolution of complex problems. This operational view of interdisciplinarity may at first sound familiar to architectural and design educators who see design studio as a 'natural' place for integration and synthesis, and therefore the place where all knowledge related to architecture should be applied through a simulation of real-life, pseudo-professional experiences. The key difference, however, is the emphasis Newell places on the 'process:' interdisciplinarity, he argues, should cut across the roles assigned to faculty and others involved in order to move the problem-solving process from the one based in 'disciplinary expertise' to the one based in 'expertise in interdisciplinary process!' (Newell 2001: 1-25; Newell 1998).

What is the concept of liberal arts education today, and can architectural design studio offer insights in defining it? The Carnegie Report states that academia at large has much to learn from architecture, particularly from the studio model of education. At the same time, however, the Report subscribes itself to the idea of liberal arts education being precisely in liberating one's education from the 'distracting business of satisfying contingent wants'.[7] In that respect, it is difficult to understand how can a project-driven education, where architectural knowledge is instrumentalized as a vehicle of design action, be simultaneously used as a model of liberal education in ways in which the Report frames is.[8] This ethical dilemma is not only unresolved in the Carnegie Report, but also holds the key to architecture's role in the future of the American university. But the question of architecture vis-à-vis integrative education, in which interdisciplinarity could be a method of acquiring new knowledge and developing new modes of thinking, cannot be conceived without scrutinizing institutional structures, mechanisms and techniques that facilitate knowledge production in the discipline of architecture.

The question today is: are the epistemological premises of the Blondel's model of architectural education still accurate, and even desirable?[9] And, given the rigid structure of architecture schools, is the flexibility of Blondel's model capable of allowing true interdisciplinary work in the design-studio? It would be safe to argue today that, as a vehicle of potential interdisciplinary collaboration, architectural studio is primarily attractive as a social environment conducive to collaboration and team work, application and reflection, and it establishes an important 'place' for integration as it anchors its spatio-temporal variables within the curriculum. The major vehicle of integration however is not

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[7] As quoted in Boyer and Mitgang 1996: 82; the quote is by British philosopher Michael Oakeshott (Boyer and Mitgang 1996: 82; Fuller 1989: 27-28).

[8] Many have proclaimed the end to liberal arts education. For instance, in his *University in Ruins*, Bill Readings powerfully articulates his idea that the historical project of liberal education has lots its organizing center focused on the idea that culture is both the origin and goal of human sciences (architecture and design are assumably parts of), mostly due to the fact that there is no longer a human subject interested in, and capable of, carrying further the project of liberal education (Readings 1996).

the studio itself but rather the content of the studio, that is 'the pro-ject.' The idea of 'project,' write Findeli and Bousbaci, should be —at the epistemo-logical level— the main object of architectural studies due to its capacity to bring together a great variety of knowledges and theoretical discourses (Bousbaci and Findeli 2005). The 'project' has the capacity to configure relationships between three main components of the design studio: *processes* (of designing but not only), *actors* (all the constituents and stakeholders involved in the processes), and *outcomes* (material as well as immaterial, buildings as well as modes of thinking). As an epistemological device, the project thus brings together both 'objects' and 'subjects' of the interdisciplinary undertaking of design studio. In that respect, as much as the design studio can become the site of interdisciplinary processes, 'the project' *de facto* becomes the site of interdisciplinary knowledge, and thus both a desirable framework and an ideal object of interdisciplinary study. Moreover, the project has the capacity to unify the desire of multiple actors to perform, i.e. to 'speak,' while at the same time enabling them to effectively take part in the production of meanings through the processes of designing. The design project thus becomes simultaneously the object of interdisciplinary knowing and the process of redefining disciplinary knowledge.

The question of reconciling the traditional ideals of liberal arts education with project-driven, studio-based educational environment that instrumentalizes bodies of knowledge towards project aims must be framed in relation to ethical (i.e. philosophical) questions of 'how one should be in the world' that should be probed through project-driven pseudo-empirical investigations. If the traditionally defined liberal arts have been focused on understanding 'how humans are' in the *world*, the liberal arts of the 'Anthropocene Age'[10] may just became focused on how human beings 'ought to be' in the worlds they simultaneously create and inhabit. As Richard Buchanan asserts, if architecture was indeed a liberal art in its own right in the ancient world, today architecture is only one manifestation of 'the architectonic art of design'[11] that, in Buchanan's view, can provide significant insights into 'the new liberal arts of technological culture' (Buchanan 1992). As Buchanan suggests, liberal arts have been historically described throughout the Western world as 'architectonic' due to their integrative potential. In his view, liberal art of today should be conceived as 'a discipline of thinking that may be shared to some degree by all men and women in their daily lives.' His argument works off Herbert Simon's proposition, forcefully argued in his *The Sciences of the Artificial*, that design should not only be a component of technical or art education, but 'a core discipline' of every liberally educated human being concerned with "how things ought to be" (Simon 1968: 83). In that respect, what drives the wide academic interest in architecture and design schools (and in the design studio as an educational environment in particular) are an insight and the desire to acquire a methodical inclusion in *the design process*. And that is precisely, I would argue in this paper, where architecture schools, and for that matter all other design schools, have repeatedly failed. In other words, we have failed to, to paraphrase Simon, discover and articulate a body of intellectually tough, partly formalizable-partly empirical, and above all teachable doctrine about the design process (Simon 1968: 58). Due to that failure, as Simon suggested, the academic world sees design as "intellectually soft, intuitive, informal and cookbooky" (Simon 1968: 59),[12] and above all determined to remain closed to 'others.' Here we find the core competency of architecture and design schools, and the most fertile ground

[9] As Anthony Vidler notes (Chadwick 2004: 17-18), the first systematic architectural curriculum was established by Jacques-François Blondel in the 18th Century France. In a Descartesque manner, Blondel's curriculum broke down architectural knowledge into analyzable units and divided its constituent parts into distinct courses in history, theory, structures, building techniques, site organization, and professional practice. All these courses developed in parallel and gravitated around the design studio (atelier), always taught by a practitioner. Vidler rightfully praises this model, which still shapes schools of architecture to this day, for its remarkable flexibility and the ability to accept change while preserving its original epistemological premises.

[10] The 'Anthropocene Age' is, as Clive Dilnot writes, "an age in which, as far as the immanent conditions of our lives are concerned, nature retreats to merely a background condition and becomes, to all intents and purposes, another moment of artifice." The artificial, argues Dilnot, "is no longer that which is marginal in human affairs [but it has become the] effective horizon of being" (Dilnot 2005: 42).

[11] Together with, or next to, other forms of professional design training, such are product design, communication design, urban design, fashion design, etc.

for interdisciplinary collaboration: the design process itself. It is thus through an internally generated quest for consolidation that architecture can find a true, democratic and inclusive way of developing interdiscipli-nary curricula.

Conclusion

It should be clear that if architecture is indeed to be among the carriers of liberal education in this century, it will have to scrutinize the most transparent and yet the most mystified of its competencies: the process of designing. In that respect, design studio, as a vehicle of specific type of social interaction specific to the design process, has the capacity to open the design process to 'others' and therefore potentially redefine 'the project' of architecture in the academia, from the disciplinary one centered in designing buildings, to the interdisciplinary one focused on how we, as human beings, could be. This effort would consolidate architecture, both from within and from without, and assist the interdisciplinary liberal education in this century in moving from the one based in a radical separation from the contingent, to the one based in 'projective impurity.' As Clive Dilnot writes, the significance of designing emerges precisely out of the condition of 'radical impurity' as a process of 'recovering' and 'rethinking' that core of human actuality that lies beneath what presents itself as a given (Dilnot 2005a: 121-127). The condition of 'radical impurity' is thus, as Dilnot writes, "not an inhibition on design, but the very source of its capacity to evade the logic of what is given." The actual value of designing is located precisely in the space of such 'projective impurity,' "between the real and the given and the possible [where] design does its work and negotiates this space." In that respect, as Dilnot writes,

> Architecture is, after all, the discovery of configurative possibility. Today, our situation gives those discoveries their point, while configuration reveals to history its previously unrecognized possibilities. This gives to architecture its role both as defense against the destructive onslaught of the markets and market serving technological modernization, and as the provider of configurative and affirmative resources through which to address the scale of problems and opportunities thrown up by these new conditions. But, this is only possible if architecture understands itself as a practice that, in offering an interpretation of our future and history, proposes models of being (Dilnot 2005b: 12).

In that sense, the project-driven interdisciplinary environment, possibly situated in the design studio but not limited to it, should be framed through an ensemble of questions of how one should be in the world, rather than through project brief that contains the so-called 'design criteria' predicated upon a *priori* known normative expectations. The questions should be integrated into the empirical research and the design process, and as such would have the capacity to advance the objective disciplinary knowledge, the knowledge of interdisciplinary process, and most importantly the form of the questions itself. Critical examination will then reflect on the difference between those questions the project started with, and the forms of questions the projects comes to closure with. It is in such a process that the interdisciplinary questions become agents of cognitive development of students, and carry its work on even after a specific interdisciplinary project itself has come to closure. Integrative design studios in that sense could have a special role to play because of their potential to create an environment conducive to simultaneous discovery, application and integration of knowledge through project-driven creative pursuits (Boyer and Mitgang 1996: 86).

Boyer and Mitgang concluded their 1996 study with the following thought: "Architectural education is really about fostering the learning habits needed for the discovery, integration, application, and sharing of knowledge over a lifetime" (Boyer and Mitgang 1996: XVI).

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[12] Design 'problems' could be defined as 'illstructured problems' (Lattuca et. al. 2004: 33), or as Horst Rittel called them, 'wicked problems,' problems that have no definite formulation, have more than one plausible explanation, and may generate many equally desirable and possible solutions. In other words, architects and designers dealing with such 'problems' are systematically incapable of producing cognitive certainty or definite answers because they are radically at odds with the logic of quantification. For further discussion see: Simon 1968, Buchanan 1992, and Lattuca et. al. 2004.

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A DISCOURSE ON THE MEANING OF KNOWLEDGE IN ART AND DESIGN RESEARCH

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Abstract

This paper discusses the problem of knowledge in research in the creative and practice-led disciplines as it appears in the UK.[1] The purpose is to clarify the role and inclusion of practice within research in relation to the requirement for making a contribution to knowledge. The paper begins by introducing the problem of knowledge in research. It then examines what kind and format of knowledge is currently formally accepted in research, and compares the result with examples of knowledge generated by research in art and design. This serves to reveal where there are gaps and contradictions between current understandings of research (research policy) and evident needs of research practice. In the conclusion, suggestions for possible future developments and research are made.

1) Introduction

One of the core requirements of research is the original 'contribution to knowledge'.[2] An 'original contribution' in this context means an addition to knowledge that is new – not just for one person (e.g. the researcher) but altogether for the field. Originality is usually demonstrated through the literature review which provides a survey over relevant existing knowledge in the field (Langrish 2000). What 'knowledge' means in this context is, however, less well definved. Its meaning seems mostly taken for granted, which proves problematic upon closer examination.

For example, problems have arisen with the conventional understanding of knowledge in research in the context of creative and practice-led disciplines, which commonly use practice as part of their research in order to gain new knowledge of existing practice (process or product), to develop new processes and skills, or to develop new objects (products). These problems concern the requirement of explicit communication of knowledge as well as its application and use, because part of the knowledge of practice-led disciplines is experience-based and therefore difficult to communicate through conventional language-based means of research.

To illustrate the problem, we might think of a craftsperson whose mastery of a particular technique leads to original results and new knowledge. However, the know-how of the mastery might be beyond verbal articulation, and so might be the knowledge or understanding gained from the use or experience of the new results (e.g. artefacts, etc.). This example raises questions about the different nature or format of knowledge sought in different research contexts, about where and how the knowledge is contained, and how it can be communicated, e.g. by textual or creative output. Uncertainties about the answers to these questions have led to problems with the conduct of research in the creative and practice-led disciplines and have revealed a disparity between research requirements and the evident

[1] With 'creative and practice-led disciplines' we include for example, art and design; music, film and media; education; knowledge management; health, nursing, physiotherapy, etc. These disciplines share problems with the generation and communication of knowledge through research, and its application in practice, i.e. with the dichotomy of explicit and tacit knowledge. For our investigation, we use examples from art and design in the UK. However, we hope we have developed the research on a sufficiently generic level so that it is transferable to other creative and practice-led disciplines.

[2] One exception to be mentioned is the professional doctorate which requires a 'original contribution to practice', although the difference to a 'contribution to knowledge' is not quite clear either. Usually, it refers to the strongly clinical nature of the professional doctorate, making its findings less generalisable than those of the PhD.

needs of research practice in design to produce results that benefit professional practice and academy alike.

The purpose of this paper therefore is to address the question of the nature and format of knowledge sought in research. The paper begins by examining some UK definitions of research from the creative disciplines. It analyses what the current requirements of knowledge are in their context and where there are disjunctions with apparent needs in research and practice. It further analyses the current nature of research through comparison with philosophical concepts of knowledge. From this we conclude on the current understanding of the nature of knowledge in research, on what its shortcomings are, and on how it might be developed to accommodate the identified needs.

2) The requirement of knowledge in definitions of research

We find the requirement for a contribution to knowledge at the centre of many of the definitions of research that are provided by funding agencies and by university regulations in the UK. For example, the definition of research for the RAE (2005) explains that,

> 'Research' for the purpose of the RAE is to be understood as original investigation undertaken ***in order to gain knowledge and understanding***. It includes work of direct relevance to the needs of commerce, industry, and to the public and voluntary sectors; scholarship [...]; the invention and generation of ideas, images, performances, artefacts including design, where these lead to new or substantially improved insights; and the use of existing knowledge in experimental development to produce new or substantially improved materials, devices, products and processes, including design and construction. It excludes routine testing and routine analysis of materials, components and processes such as for the maintenance of national standards, as distinct from the development of new analytical techniques. It also excludes the development of teaching materials that do not embody original research.

and the guidelines of the AHRC (2005) state that,

- it must define a series of research questions or problems that will be addressed in the course of the research. It must also ***define its objectives in terms of seeking to enhance knowledge and understanding*** relating to the questions or problems to be addressed.

- it must specify a research context for the questions or problems to be addressed. You must specify why it is important that these particular questions or problems should be addressed; what other research is being or has been conducted in this area; and ***what particular contributian this project will make to the advancement of creativity, insights, knowledge and understanding*** in this area.

- it must specify the research methods for addressing and answering the research questions or problems. You must state how, in the course of the research project, you will seek to answer the questions, or ***advance available knowledge and understonding*** of the problems. You should also explain the rationale for your chosen research methods and why you think they provide the most appropriate means by which to answer the research questions.

Further, University regulations e.g. of Plymouth University and of the University of Hertfordshire state respectively that,

The degree of Ph.D. should ***include a distinct contribution to the current knawledge*** of the subject. The thesis should show systematic study and independent, critical and original powers and should be capable of publication in whole or in part (Plymouth 2003/4).

and that,

> A candidate for the award of PhD shall have undertaken a substantial programme of individual research, involving the sustained exercise of independent critical powers including the ability to use research outcomes to guide the development of the research programme, and ***leading to a significant original contribution to knowledge or its interpretation***.
> The candidate shall present the results of the research in a submission, embodying a thesis presented and defended in a lucid and scholarly manner, and containing material worthy of peer-reviewed publication.
> The candidate shall demonstrate technical competence

> in the chosen field, including appropriate knowledge and use of research methods and of a substantial body of other relevant work, and an appreciation of the context and significance of the thesis (Hertfordshire 2006).

All four definitions emphasise the contribution to knowledge as a main requirement of the outcome of research. However, while these regulations go on to set out further formal requirements for the conduct of research, they remain silent about what knowledge and understanding means in the context of their specifications. For example, the AHRC definition emphasises on explicatory and analytical documentation of research (see also Biggs 2002), in particular where practice is part of research:

> This definition of research provides a distinction between research and practice per se. Creative output can be produced, or practice undertaken, as an integral part of a research process [...] The Council would expect, however, this practice to be accompanied by some form of documentation of the research process, as well as some form of textual analysis or explanation to support its position and to demonstrate critical reflection. Equally, creativity or practice may involve no such process at all, in which case they would be ineligible for funding from the Council (AHRC 2005).

Tacitly implied in this addition is that the documentation has the purpose of explicating the original contribution to knowledge. Further, the requirement for textual analysis/ documentation seems to indicate that the contribution to knowledge can (only) be explained and communicated by textual means. However, this leaves the role of the creative process/output with regard to the generation and communication of knowledge largely undefined.

One finds a similar lack of clarity in regulations for PhDs, in particular where the integration of creative practice is concerned. In their review of *Doctoral Study in Contemporary Higher Education*, Green and Powell (2005: 100-11B) explain that most of the university regulations that offer explicit rules for practice-based research degrees permit submission of creative practice in conjunction with a written piece (thesis, exegesis) of variable length for a research degree. As with the AHRC definition, the problem is that while they specify the formal relationship between practical and written work, they remain silent about the intrinsic relationship of the two, i.e. about how the two parts relate with regard to the embodiment and communication of knowledge.

Green and Powell recognise the dilemma that this lack of specification creates for the understanding of practice-based PhDs and point out that there is as yet no national consensus about the regulations and conduct for them (103). Besides the most common practice of submitting creative work together with a thesis, the debate is still ongoing (and manifest in some Universities' regulations) as to whether

> a Practice-Based Doctorate can be awarded solely on the basis of the production of creative work(s) – assessed by knowledgeable peers who are experienced in the field and who can therefore pass judgement on whether or not the work(s) is worthy of note as excellent in respect of the criteria operating in that field and as contributing to knowledge itself (103).

Whether or not the creative work submitted for a practice-based PhD has to be of professional excellence may be arguable, while it seems to be commonly accepted by now that the original contribution to knowledge is an essential criterion for awarding a PhD, including a practice-based PhD. However, it remains unresolved in which format this knowledge is to be presented, and which role practice has concerning its embodiment and communication.

Tracing the problem about the embodiment and communication of knowledge further, we find that it may have its foundation in another problem. Green and Powell (2005: 101) consider that "the PhD is a generic award made for contribution to knowledge... whatever the nature of that knowledge". Their statement is of significance because it implies that there may be different kinds of knowledge, which may require different modes of embodiment and of communication of knowledge. Clarifying the nature of knowledge in the context of research therefore may hold the key to answering all subsequent questions concerning the embodiment and communication of knowledge in research in the creative and practice-led disciplines.

3) Reviewing the meaning of knowledge in the definition of research

The above discussion has shown that the understanding of knowledge in the definition of research has been left undefined. It seems obvious to conclude that the definition therefore should accommodate all relevant forms and meanings of knowledge. However, the discussion of research regulations (§2) has indicated problems and uncertainties in practice-led disciplines concerning the inclusion of certain formats of knowledge as research contribution, which contradict this conclusion.

In answer to this contradiction, our conjecture is that it only appears that the meaning of knowledge is not defined and that the definition of research really refers to, and prioritises, what is known as explicit or propositional knowledge. It is not immediately recognisable that the definition of research prioritises propositional knowledge because the meaning of knowledge is not explicitly specified in the definitions of research but rather it is qualified implicitly through related requirements. This becomes apparent when analysing the formal requirements of research concerning accepted formats of presentation of the knowledge contribution. In the following, we therefore investigate these formal requirements and how they pertain to propositional knowledge.

There are a number of additional requirements in the definitions of research that further specify the central requirement for a (original) contribution to knowledge as an outcome of research, qualifying its character and format. For example, regulations of both the AHRC and of the University of Hertfordshire require a written document as part of the outcome of their research, the purpose of which is to provide a critical reflection or thesis:

> The Council would expect [...] practice to be accompanied by some form of documentation of the research process [containing research questions, methods, and context], as well as some form of textual analysis or explanation to support its position and to demonstrate critical reflection (AHRC 2005).

The University of Hertfordshire makes the following requirement concerning the submission of a PhD, MPhil, or MA/MSc by research:

> A submission must contain a written document that presents and defends a thesis... A thesis is an intellectual position capable of being maintained by argument. A submission may also contain other works on which the thesis and its defence are based (Research Degrees Handbook 2004 Regs Page A6, University of Hertfordshire).

The requirement for *textual/written presentation* implies the requirement for explicit communication, e.g. of research question/problem, objectives, context, and method, and is also consistent with requirements for *dissemination* in order to share the knowledge that constitutes the research findings. The analytical character of language allows eliciting one specific meaning of any particular issue and thus facilitates unambiguous communication (Niedderer 2004b), which is essential for *maintaining the intellectual position* (thesis, proposition) that is required of research. The proposition or thesis is to be *defended by an argument*. The argument has a certain logical structure in which the proposition is substantiated through evidence-based reasoning, and which sets out why or why not the proposition should be believed to be true. The outcome of the research, showing whether the proposition could be sustained or whether it was refuted and why, is usually seen as the core of the contribution to knowledge. Examples for this on different levels of inquiry might be;

Proposition 1: "The use of laser-welding technology can offer new (technical, aesthetic, etc.) opportunities for goldsmithing and silversmithing." – The argument would have to identify and demonstrate through evidence what opportunities there are and that previous technologies did not offer these opportunities. – The contribution to knowledge would accordingly be the knowledge of these new opportunities and how they can be realised through laser-welding technology.

Proposition 2: "There is a new category of design object." – The argument has to identify the characteristics of this category of objects, and it has to demonstrate that (at least theoretically) such objects can exist and that they are different to other categories of design object. – The contribution to knowledge would accordingly be the new knowledge of the existence of a certain category of design object.

A further requirement, asking for a *significant* contribution, implies that the result should not just be relevant for the one specific case, but that the research should elicit something generic about the phenomenon in question, such as characteristics or principles. For this reason, when talking about propositions, we commonly think about them as linguistic constructions (although language is no absolute requirement for making a proposition, Biggs 2002). This is because language offers the potential for abstraction because of its representative character which allows extracting and detaching relevant aspects from a specific situation, case, etc. and thus make them *transferable and/or generalisable*.

The above explanations and examples imply a certain philosophical position, which is closely linked to the grammar and logic of language, and which shape the logic of a thesis, its argument and its evidence-base. This position determines what is a valid argument, and what is a valid and rigorous methodology in its context, i.e. use of methods to gain evidence. Our conjecture is therefore that this position is the position of propositional knowledge as we shall see in the following.

4) The characteristics of propositional knowledge and its prioritisation in research

In this section, we discuss what we mean by propositional knowledge and how the requirements imply and pertain to propositional knowledge. We begin by introducing the idea and characteristics of propositional knowledge with a brief introduction of knowledge in philosophy (epistemology).

Two of the main concerns of epistemology are the questions 'What is knowledge?' and 'How do we know?' There is a long history of investigating these two questions with different results. During the 20th century, there has been much debate about whether we can define what knowledge is. The definition of knowledge as "justified true belief" is the definition that has probably received the most widespread consent, although it has also been challenged (Grayling 2003). The definition of knowledge as 'justified true belief' needs explaining, before considering the challenges that have been mounted. Grayling (2003: 37) explains that,

> This definition looks plausible because, at the very least, it seems that to know something one must believe it, that the belief must be true, and that one's reason for believing it must be satisfactory in the light of some criteria – for one could not be said to know something if one's reasons for believing it were arbitrary or haphazard. So each of the three parts of the definition appears to express a necessary condition for knowledge, and the claim is that, taken together, they are sufficient.

Grayling (2003: 39) explains further that this definition of knowledge "is intended to be an analysis of knowledge in the propositional sense" (rather than of knowledge that one might gain by being acquainted with something or someone, or that enables someone to do something (skill)), and that it is the kind of knowledge that has predominantly occupied philosophy. One might therefore add to the definition that knowledge is the *justified true belief of a proposition*.

However, in 1963, Gettier raised objections against this definition of propositional knowledge, which led to the request for a fourth as yet unknown condition to establish "justified true belief" as the definition of knowledge or, alternatively, for a completely new definition of knowledge (Hospers 1990; Pollock and Cruz 1999; Grayling 2003). Gettier's objection was that no causal link can be shown between what is taken to be 'true belief' and the 'justification' for it. There are also other problems with the third condition of knowledge, i.e. with justification. Hospers (1990) gives several examples, of which I shall introduce the last, because of its consequence for the further argument:

> There is yet another kind of objection to the third condition of the standard definition of knowing. Knowing p requires having evidence for p; let us say that this evidence is another proposition, q. But don't we then have to know that q is true? If I don't know that q is true, how can q be good evidence for p? And how do we know q? Perhaps by another proposition r. And so on – it seems that we are caught in an infinite regress. The requirement of evidence always takes us beyond the original proposition, p, to another one, and then we have to know the truth of that one in order to know the truth of the original one (Hospers 1990: 30).

In order to manage this infinite regress, philosophers have put forward two different ideas. One idea is that,

> We don't really know *any* of them [i.e. the propositions] in isolation, but that *p,q,r* and others simply lend support to one another, and each one of them makes the other more probable (Hospers 1990: 30).

The other idea is that there are propositions that are foundational in the sense that they are self-evident and therefore need no further evidence. For example, someone might say that they feel tired. If asked how they know this, there would be no further explanation than that they have the experience of feeling tired.

We find that both these ideas are accepted (within limitations) for obvious pragmatic reasons. This pragmatic stance is further justified by the consideration how we can know that we don't have any knowledge. Because, if we cannot have knowledge of anything, it follows that we cannot know either that we have no knowledge. This leads into a circularity that means that we can neither prove nor disprove whether we have knowledge. It is therefore useful to accept the two ways that are currently available to justify true belief as knowledge. We can find the acceptance of these two principles also in research, which allows us to conclude that the research contribution implicitly refers to propositional knowledge. In summary, research requirements and regulations pertain to propositional knowledge in the following ways:

- Firstly, research requires a thesis or *proposition* to be put forward. Drawing on Frege and Russell himself, Wittgenstein was most influential in shaping the understanding of what a proposition is (Kenny 1973/2006: 54). In his sense, a proposition may be understood as a sentence or thought that is the representation (or abstract 'picture') of reality (or 'fact'). This reality or fact may be represented through language. Because it is a representation, a proposition can be true or false and may receive its verification through comparison with reality, i.e. through the research requirement for evidence-based reasoning.

- Secondly, research requires this proposition to be defended by an *argument*, which serves to demonstrate that our 'belief' (proposition) can justifiably said to be 'true'.

- Thirdly, research requires this argument to be substantiated through *evidence-based reasoning*, which is based on either or both of the principles discussed above, i.e. either on a coherent set of propositions that all support each other and therefore plausibly support the argument, and/or on facts/propositions that are self-evident (e.g. I feel tired and therefore I know I am tired; an experiment which demonstrates any given proposition).

For these reasons, we can justifiably assume a prioritisation of propositional knowledge, including the prioritisation of language within research.[3] On this basis, it seems perfectly adequate to include practice in research as form of evidence in support of theoretical, linguistically communicated outcomes. However, current research practice shows that many practitioner-researchers feel dissatisfied with this prioritisation. On the one hand, there is the perception that it is difficult to communicate the knowledge that practitioners have in the required way. On the other hand, there are concerns that the form of knowledge produced by research is difficult to absorb and apply, because parts of the knowledge essential for application are missing. In the following section, we shall analyse what the problems of creative and practice-led disciplines are with the prioritisation of propositional knowledge.

5) Problems with propositional knowledge in creative and practice-led research

This section examines problems with the prioritisation of propositional knowledge in the creative and practice-led disciplines in order to identify potential avenues for solving them. The main indicator for the problems at hand seems to be the wish of practitioner-researchers to use practice within

[3] Because of its link to language, in much of the research literature, propositional knowledge is also referred to as explicit knowledge. However, this is not necessarily accurate, because on the one hand propositional knowledge has a tacit component, which lays e.g. in extracting the meaning of the proposition from the words that make up the propositional sentence. On the other hand there are parts of so-called tacit knowledge (or experiential or non-propositional knowledge) that can indeed be put into words, such as certain instructions how to do a certain task. To clarify the meaning and relationship of these different terms will be the task of forthcoming research.

research. Related to this symptom is a frequent uncertainty of practitioner-researchers about the role of practice in the context of research, about how to relate theoretical and practical work and fit it within existing research regulations. This uncertainty, which has been briefly discussed above, has been a reoccurring theme (Durling et al. 2002), which has been reflected in educational research papers such as that by Langrish (2000) who has addressed this uncertainty on a pragmatic level within the conventional understanding of research. However, since the wish to use practice within research as well as the uncertainties about it persist, the question arises why practitioners feel the need to use practice within research and why it remains problematic.

The reason for *practice being used in research* in the creative disciplines (and related inquiries) is that it creates the object of inquiry in the sense that the research is either concerned with the process of creative practice or it investigates its results. Scharmer (2000) talks about embodied and not-yet-embodied knowledge to denote that in some disciplines new realities (e.g. artefacts, processes, services etc.) and with them new knowledge is created. The creative use of research for developing a new reality is quite unlike the understanding of traditional (scientific) research in that it investigates *what could be* rather than *what is* (Niedderer 2004a: 26). Researchers in the creative disciplines have also used creative practice in research in order to achieve the inclusion of tacit knowledge gained in practice, such as skills, an intuitive grasp of the state of the art of a field, or expert judgement.

The use of practice in research can therefore be seen to serve two purposes: firstly to facilitate the inclusion of existing personal/tacit knowledge in research; and secondly, to facilitate the creation and communication of new knowledge. Concerning the former, although there does not seem to be any intrinsic problems with using practice within research (Niedderer 2007), problems have occurred in the past with the use of creative inquiry in terms of validity because of the understanding of creative inquiry as an emergent and unsystematic process, while research is aimed at being a systematic inquiry. Recent examples of research inquiry using creative practice (e.g. Whiteley 2000; Niedderer 2004a) have demonstrated that the problem of validity can be overcome if the creative part of the inquiry is appropriately framed and integrated into the research process. The second problem concerning the role of practice in the creation and communication of knowledge in research is more complex. It has two aspects. One is the communication of advancement in process knowledge; the other is the communication of knowledge related to the products of practice as research outcomes.

Beginning with the latter, the reason for *presenting practice as a result of research,* traditionally, is its use as evidence, with the outcomes of practice being presented supplementary to a critical exegesis, report, etc. which presents the research process and contribution to knowledge. This is coherent with our earlier developed understanding of research as presenting the defence of a proposition, i.e. of a representation, which can be true or false, and which may receive its verification through comparison with reality, e.g. the outcomes of practice in form of an artefact. The presentation of practice as evidence raises the question as to why we should need both text and practice because one could argue that, if the proposition is a representation of the practice, the central meaning of the proposition must be contained within the object and that therefore the presentation of practice alone should suffice. For example, if the proposition about a green ball is that "the ball is green", will not the ball tell me the same if the proposition is true? Although this is correct, when presented with the ball alone, I have no means to determine whether not the proposition is 'the ball is round'. This example suggests firstly that the same knowledge is contained in the practice/artefact and the proposition and that we are not dealing with two different kinds of knowledge but rather with two different formats of knowledge, which is supported by research into tacit knowledge by Neuweg (2004). Secondly, the example shows that the analytical character of language is important for unambiguous communication. In this context, Biggs (2002: 24) has suggested that it might be possible to present an argument by non-linguistic means, but that the challenge is to achieve contextualisation by non-linguistic means to explain the research, and that this challenge has as yet not been met.

While these considerations defend the prioritisation of language in the communication of the contribution to knowledge, in recent years, there have been examples of using practice within research in which practice seems to provide more than just evidence, i.e. that show that it can provide an enriched knowledge that cannot be verbalised. For example, Whiteley (Rust and Whiteley 1998) has developed "a mechanical analogy for the human

skeletal arm to inform the future development of prostheses and other artefacts" (Rust et al. 2000: 1) through drawing and modelling. Both the investigation and the communication of the findings in this case were dependent on the drawings and models, which provided not only the (propositional) knowledge of an improved articulated prosthesis (knowing that), but also provided experiential knowledge of how such a prosthesis might be constructed and work. This means the drawings and models additionally provided the understanding that is needed to apply the knowledge gained in practice. This example demonstrates the importance that creative practice can have for communicating tacit knowledge as part of research, and it seems that it would be useful to recognise this importance formally in the requirements and logic of research.

The communication of the contribution of research using practice is more problematic *where the research is concerned with process.* For example, we can imagine a researcher writing down the findings and knowledge that they have gained from their research into a certain process, and that they describe both process and outcome as accurately as possible so that anyone can inform themselves about the research. According to the conventional understanding of research, we should expect anyone to being able to repeat the process and arrive at the same results. That this is not the case is demonstrated in the following example where a Canadian Research Laboratory successfully built a so-called TEA-laser. British attempts to replicate the laser on the basis of written information however failed as long as the tacit knowledge of informants who had participated in building the original laser was not included through their personal engagement in the replication-project (Neuweg 2002: 42). Examples such as this demonstrate that it is often difficult to communicate the knowledge that practitioners have in the way that is required of research. Practitioners from a wide range of subjects have therefore voiced concerns that an important part of tacit knowledge that is contained within practice is at risk of being overlooked and omitted in the conventional communication of research (e.g. Higgs and Titchen 1995; e.g. Rolfe 1996; Neuweg 2002), because of the limitations of language, and because the research process and the knowledge that is its outcome currently seem to be dissociated in the final presentation of results. As a result, the research outcome currently only distils what can (and is intended to) be made explicit by the researcher while much of the tacit knowledge inherent in the research remains unacknowledged (Neuweg 2002; Eraut 2003; Biggs 2004). However, this omitted part is highly important for practitioners, because it facilitates both understanding and applicability of any explicit knowledge.

The above indicates that the problem is not a problem with the use of practice within research as such, but with the communication of experiential or tacit knowledge (including perceptual and procedural knowledge) gained from its processes with regard to application. This makes the problem an educational problem, which I suggest can be approached in two ways.

Firstly, the problem can be seen as an organizational problem. If we accept that experiential knowledge can only be partially communicated by language, and if we look around how people have dealt with the communication of experiential knowledge so far, we find that the most common way of communication is through observation and imitation, as we find it e.g. in apprenticeship systems or in mentoring schemes (Friedman 1997). Although this kind of communication system is mirrored in the system of doctoral supervision, which therefore sometimes is called an 'apprenticeship in research', this system has not been widely applied to the communication of research outcomes. The reason for this may partly be the labor-intensive nature of this kind of tutoring, which is contrary to the aim of wide dissemination. Partly, it may be simply that there are not that many researcher-practitioners yet, e.g. in art and design. Nevertheless, the integration of research result through practice-related workshops etc. could be increased and thus the effectiveness of research communication.

Secondly the problem can be seen as a problem of knowledge communication, which raises the question whether the elusive part of experiential knowledge can be communicated directly, or whether it has to be communicated indirectly via so-called 'knowledge conversion'. Direct communication might, for example, be achieved through the use of new media, which would attempt to transmit the experience of the teacher in the same experiential form to the learner. One might imagine here the use of new technologies that might allow the transfer of an experiential stimulus to the learner through electronic devices, rather than the communication through conventional means of observation and imitation, which seem less precise. This option is not yet available, but

might be a future option since it is being tested in various forms, most prominently by the artist *Stelarc* (1996). Therefore the indirect approach of 'knowledge conversion', which is closely related to the organisational approach, might be the more realistic option, at least for the time being. The most prominent model of knowledge conversion has been developed by Nonaka and Takeuchi (1995, 2006) in the context of knowledge management as a pragmatic means of bridging the gap between explicit and tacit knowledge. They propose a four-stage-model of knowledge conversion for the purpose of sharing experiential (tacit) knowledge, which covers all possible constellations of knowledge transfer, i.e. for tacit to explicit, from explicit to explicit (usual form of research communication), from explicit to tacit (application), and from tacit to tacit (ix). They further discuss different techniques for managing each transfer-form. The application of the model to managing the communication process in research in the creative disciplines therefore seems a promising avenue and will be the subject of forthcoming research.

6) Conclusion

In this paper, we have examined the notion of knowledge in research. By analysing definitions of research, we found that the understanding of the term 'knowledge' in the definition of research is not explicitly defined. Through analysis of related research requirements and their comparison with the characteristics of propositional knowledge, we could show that the 'knowledge' in the definition of research is implicitly determined as both explicit and propositional knowledge, which has come to mean communication by verbal means. We have further investigated the consequences of this understanding of knowledge in research for research practice in the creative and practice-led disciplines.

We have been able to show that some of the uncertainties and problems of current research practice are caused by this implicit understanding of knowledge. However, the problem does not seem to be a problem with the use of practice within research as such, but a problem with the communication of the knowledge gained from the research, especially where process knowledge is concerned, because the language-based prioritisation of propositional knowledge excludes (some part of) experiential knowledge which cannot be communicated by verbal means and which is essential for the application and use of any knowledge. In due course, we have identified the problem of communication as an educational problem, which can variously be regarded as a problem of organisational or of communicational nature, and for which relevant avenues for future investigation have been identified in §5.

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SIGNS OF DISCOURSE: SITE MARKERS AS PLACES OF CULTURAL NEGOTIATION IN LADAKH, INDIA

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Abstract

The Ladakh region of northwestern India has been open for tourism and trade only thirty years. The ecologically sustainable and integrally Himalayan Buddhist way of life is under threat as the new cash-based economy forces Ladakhis to become consumers. This shift in prevailing socio-economic models is manifested within the region's forms of visual communication, which have transformed in prominence from architectonic semiotic structures to graphic components of wayfinding systems. These systems are, in turn used by hegemonic agencies that appear to lay claim to territory, both physical and psychological. Three networks under consideration include Buddhist devotional structures, federal highway safety signs and NGO-produced Eco-tourism Maps. This paper addresses the ways in which representational devices deployed throughout the sign systems display their status as agents of the predominate forces currently shaping discourse in the region, and that as agents, they help determine who does and does not have a voice in the negotiation.

Introduction

On a daily basis, discourses occurring within the spaces we traverse control in large part, our interactions with the world. In their book, *Discourses in Place: Language in the Material World,* Ron Scollon and Suzie Wong Scollon write, "Instrumental to the process of shaping those discourses are the objects by which we index our own positions and identities in the world" (2003: x). That indexicality, to use their term to describe the significance of objects' placement in the material world, is symptomatic of our behaviour which has determined our decisions on how to move about spaces in response to physical signs and markers that label, direct, regulate and signal to each user his/her position within institutionally encoded environments.

The northern-most state of India, called Jammu and Kashmir, is divided into three major regions: Jammu, Kashmir and Ladakh. Situated in the Himalayas and comprising remote villages, monasteries and the central town of Leh, the region of Ladakh has been open to tourism and commercial trade only 30 years. With the influx of outside populations including tourists and new residents, has come a cash-based economy and an acceleration of visual culture common to what has been traced in Western culture since the Industrial Revolution. Sergio Correa de Jesus describes such development in the West, "...the shift from the 'environment and architecture as signs' to 'visual/typographic signs' meant a disproportionate advance of a verbal form of communication in place of a more stable and permanent codification of meaning through buildings" (1994: 34).

In Ladakh, the shift in prominence of communicative form alongside changing socio-economic models is most apparent in the abundance of graphic signage crowding the streets of Leh. Retail and guesthouse signs attracting tourists are usually inscribed in English. Traffic regulatory and public health information signs, apparently directed at a local audience, usually appear in two of the official languages of India, English and Devanagari, the written form of Hindi. Older Ladakhis rarely understand either language. Those considered middle age may speak some English, but likely do not read it. Only the few generations of young adults educated since the mid-1970s have been taught to speak, read and write English. Of those, the most proficient are the children of families who could afford to send them "down to India" to school, a practice both enabled by and contributing to the dependence on a cash-based economy as families send their farm hands to be educated and in turn must hire outside laborers. This opening of the production-

consumption cycle to include cash transactions led to Ladakhis finding themselves in the new role of consumers.

Michel de Certeau describes the term "consumers" as a euphemism for those who are the dominated element in society, (1989: xi) subject to the conventions of economic models controlled by forces far removed from specificities of everyday life. In Ladakh, earlier cash-less-ness rendered the people unrecognizable on the world market. In a consumerist sense, Ladakhis are materially poor. Advertising images and other graphic design artefacts now comprising the visual language in their villages and towns seem strategically placed to remind the people of their status.

The relative newness of "visual/typographic" expressions of communication in Ladakh and the evidence of their placement in the evolving socio-economic culture allows us to consider their roles as the instrumental objects currently shaping discourses in the region.

There are three salient networks of site markers that delineate human navigational relationships to the terrain. Each network is comprised of multiple elements, which employ a consistent visual language. They exhibit characteristics of wayfinding systems, which define paths available to the traveller and provide information about what lies ahead. By identifying the agent behind the production of these signs, one is able to reveal the emerging socio-economic discourse of the region, and the indigenous peoples' roles within it. These three networks are: Buddhist path-marking structures; the Indian government's Border Roads Organization (BRO) highway project signs; and non-governmental organization (NGO)-produced "Eco-Tourism Maps."

Known as "Little Tibet," the region is steeped in traditional Himalayan Buddhism. Symbols of practice are integrated into all parts of everyday life. The devotional structures dotting the vast landscape are evidence of the influence of the numerous monasteries across the region. The most abundant of these structures are called *stupas*. Originally designed as reliquaries for prominent monks in the vicinity, they are built to exacting measurements based on the bodily proportions of the Buddha. These monuments usually appear aligned in rows along the edge of a path or road in ancient to modern chronology.

Mani walls (Figure 1) are also common features of the Ladakh landscape and index the ancestral relationship of the people to Tibet. Usually measuring about 2 meters high, they are built to varying lengths. A short wall may measure as few as 10 meters while some stretch 100 meters or more. The walls, constructed entirely of stone, conform to the landscape and undulate with the topographical contours of the paths they help define.



Figure 1

Himalayan Buddhist markers are often situated in what Scollon and Scollon would otherwise call "non-semiotic" space. However, this is not in the way they describe "socio-cultural systems that define some spaces as prohibited for semiotic overlay," (2003: 111) referring, for example, to the western preference for keeping natural areas pristine without overt human intervention. In the high mountainous desert of Ladakh, there are areas between villages where the vast landscape is devoid of human structures. Footpaths — created by both humans and grazing animals — are sometimes the only readable markers on the geological surface. At the highest passes are piles of stones and Tibetan prayer flags — markers semiotically important to all travellers as they indicate the way over a mountain to those approaching it from either side. From these vantage points one can often determine the continuation of the trail and the direction of the next village by discerning a distant mani wall on the valley floor.

Buddhist markers help channel human movement patterns throughout Ladakh. As with all sacred Buddhist structures, it is proper to pass with the structure on one's right. This convention is fundamental to the flow of human movement — whether on foot on a remote trail or in a vehicle on a narrow street in town

— and is adhered to even when it necessitates crossing the path of oncoming travellers to do so. Visitors who become sensitized to reading the structures as navigational devices, and alter their movement to participate in local custom, become more fully engaged in the place. This decoding of the local visual language affords the opportunity to participate in the geo-cultural and spiritual choreography of navigation indigenous to the region.

A major aspect of the visual language of the Buddhist structures is contained within the mani walls, many of whose stones are incised with the mantra "Om mani padme hum." It is always inscribed in Ladakhi or Tibetan characters. This typographic signature is integral to the region and the language of inscription cannot be separated from it. While interpretations of the phrase vary according to source, the literal translation is "Behold! The jewel in the lotus." Buddhist practitioners agree that this translation is insufficient to represent the depth of the mantra's meaning. However, the Border Roads Organization (BRO) refers to the mantra and references its linguistic significance in the region on a gateway sign situated on a road leading into the central town of Leh. The sign reads in English, "'Ladakh' the Jewel in the Crown of India" accompanied by BRO identification (Figure 2).

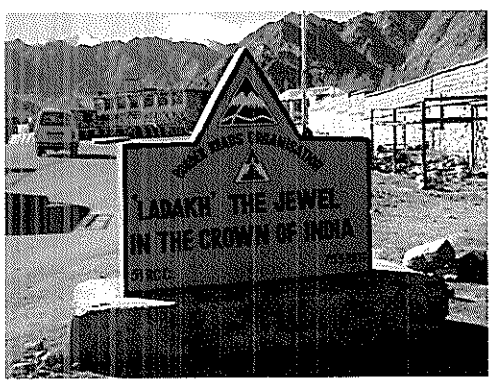


Figure 2

The state of Jammu and Kashmir is nicknamed "The Crown of India," ostensibly due to its position as the northern-most state in the country. The reference to an entire region as the jewel of that crown calls to mind both a precious item worth preserving, and a subordinate in need of a structural support mechanism, such as the metaphorical bearer of the crown, the government of India. Through the turn of phrase on the sign the federal agency establishes the subject position assigned to Ladakh within the discourse of current development strategies that include the construction of a new major road for both commerce and armament transport for the intense military build-up in this politically charged region. That the marker is inscribed in English only signals its role as an agent of the "proper" as defined in de Certeau's bilateral model of power relations (19B9: xix). The organization calls itself "The Mountain Tamers" and dynamites the mountainside to conform the land to transportation grade. The mission of the BRO, as stated on their web site is, "To support the armed forces meet (sic) their strategic needs by committed, dedicated and cost effective development and sustenance of the infrastructure" (bro.nic.org). By identifying the agents of production as organizations, actual people on either side of the action are exempt from negotiation as if hegemonic models move into place on their own accord.

However, in an effort to connect with drivers on a colloquial level, the BRO has incorporated a quasi-transgressive element on the major road. Posted periodically along the edge are signs painted in the familiar bright cautionary yellow and inscribed in English and occasionally Devanagari with playfully sexual statements meant to inspire safe driving. The phrases such as "Darling I want you but not so fast" are decidedly aimed at a predominantly male driving audience. This tactical posturing on the part of the BRO has made its signs popular in the "blogosphere" inhabited by people who have travelled through India. However, it is not truly of a tactical nature because of the blatant exclusion of the group most affected by the development in the region. This exclusion happens on two levels, through the choice of written language(s), and use of culturally insensitive verbiage. One might argue that if the words cannot be read, they must not be terribly harmful. However, as objects contributing to the current discourse, the BRO signs serve to index those who are and are not intended to take part in the future whose components will be delivered to Ladakh along this very road.

In his analysis of de Certeau's work, Jeremy Ahearne posits that in contemporary power relations, the lines of demarcation between strategies and tactics are not as straightforward as originally described. He says, "The more strategic resources which an agency has at its disposal, the more it can afford to 'waste' on tactics designed to confuse, mislead or seduce its targets" (1995: 162).

Other examples of signs deploying deceptively tactical maneuvers are the Eco-tourism Maps situated at the entrances of select villages (Figure 3). These maps are visual manifestations of a joint initiative by a US-based NGO and local organizations to provide both income opportunities for village families and room-and-board for the ever-increasing number of trekkers to the remote areas of the region for whom there was no tourism infrastructure.

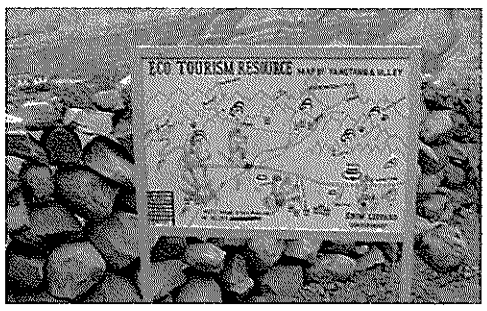


Figure 3

According to Scollon and Scollon, there are two distinct ways that a sign can make meaning: indexicality, i.e., its geophysical placement; and symbolization, i.e., its representation of something absent or metaphorical (2003: 133). The Eco-tourism maps paradoxically take on both qualities as described above. They index the opportunity for the generation of income within the village by featuring the availability of home-stays with local residents. The maps also symbolize the value systems embedded in a Western-style design solution applied to a regionally specific problem. They conceal — through the use of representational devices that, by signalling the presence of the "other", appear to speak for the people upon whom the maps have been imposed — the power relations of the organizations behind their production. The hand-drawn map, typography and exaggerated scale appear tactical in nature — a map by the local people for the local people to advertise their services to an international audience of trekkers — in English. But investigation reveals the objects of preference on the maps: the priorities of the Rolex-funded Snow Leopard Conservancy (SLC), the US-based NGO involved in the initiative. The map is not only irrelevant to the people of the village, but of very little value to the trekker who, upon encountering it after full emersion in the indigenous architectonic sign system discussed above, can only feel a sudden barrier put between him or her and the experience of the region. The map apparently meant to signify the blurring of the tourist/villager divide, in reality only accentuates it. What appears to have been conceived with good will as an opportunity for a designed artefact to meet the needs of conflicting parties — the SLC, villagers losing livestock due to snow leopards and trekkers seeking ever more remote sites — the map at best helps generate some income for families. At worst it is nothing more than an agent of the dominant economic model by which Ladakhis are becoming "consumers", compelling them not only to abandon traditional and sustainable ways of life as they become obsolete, but to preserve enough tradition in tact to sell it back to Western trekkers for their own "authentic experiences."

The intersections between two marker systems are sites where shifting hegemony in the region is made visible (Figure 4). The markers lay claim to the terrain as representatives of the larger interests, the "propers" of which they are agents. Thus far the only role for visual communication design in the region of Ladakh is in service of outside interests, presented in the name of defining, then addressing needs of local people. The modes by which Ladakhis themselves, as new consumers, will utilize design remains to be seen. However, the strategic exclusion of an entire population from current discourse through visual representational practices is a design problem. The question remains whether or not it can be addressed from within the consumer group in a strategic way rather than with only reactionary tactics. In *Thinking Design*, Singanapalli Balaram calls for a rethinking of the traditional designer/client relationship by imploring designers to pay attention and learn "by a sincere study of people's own solutions" (1998: 79) when considering contemporary design problems in India.

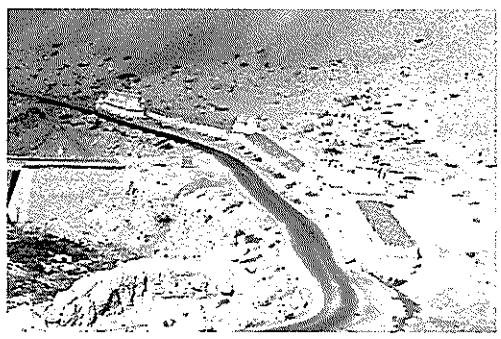


Figure 4 (photos: Helen Cannon-Brookes)

The relative newness of this region's exposure to the outside world renders it vulnerable to the negative effects of an image-based visual culture. Within one generation of having been open to tourists, there has been significant decline in the cultural and ecological bases upon which the people had prospered for centuries. However, this process of cultural transformation also affords designers the opportunity to examine the place of design in society and to propose ways for it to be deployed in meaningful ways — to be integrated with rather than to undermine the value systems of the people of the region.

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HOW TO ADD CULTURAL ATTRIBUTES TO THE DESIGN PROCESS OF A DIGITAL VIDEO LIBRARY'S USER INTERFACES

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Abstract

In this study we try to research how cultural attributes can be added to the design process of a Digital Video Library (DVL). Firstly, we present a fundamental design scheme of a DVL and introduce determining DVL projects. Then, we discuss in details different models of implementing cultural values to user interface design and feature a new cultural model, which is a syntheses of different cultural methods. After that, we present the contribution of three different levels of the cultural model to DVL components. Thus, we clearly display on which part of design process of video summarization interfaces cultural attributes can be decisive. Finally, we propose a process model for video summarization interfaces and add a short guideline for designers and developers. In this study we present a theoretical approach which needs implementation, usability testing and validation. This approach is not cultural-centered design, but a culturally sensitive proposal, where functionality of the system is as much important as the cultural contribution. The main idea of theoretical approach is that cultural influence should not only be seen in the appearance of the user interfaces, but it should be decisive in other stages of the design, i.e. metaphorical approach, navigation flow, interaction preferences, video summarization techniques, etc.

1. Introduction

Digital Video Libraries (DVL) has been a noticeable research area with the increasing popularity of video medium in last few years. Most of the studies on DVLs are focused on the functionality success of the system, and user interface design and usability issues are less discussed subjects (Lee and Smeaton 2002). Although different methods are presented in the studies about the interface design of a DVL, none of them is exploring the influence of 'culture'. The main goal of this article is to answer the question, 'how we can add the cultural attributes into the interface design process of a DVL?'.

Since we are emphasizing the cultural characteristic of the user, we are focused on a *user-centered design* of a DVL. In this context, for clarifying the main objectives of this study, we try to answer two sub-questions listed below:

- In which phases should cultural attributes be added into the design process of a DVL?
- To which extend should cultural attributes be added into the design process of a DVL?

Because the approach presented in this article is merging different disciplines, it is a multidisciplinary research. Cultural attributes are derived from different disciplines, i.e. *intercultural communication* and *semiotics*, and user interface design is an area from *human computer interaction* field. Therefore, we should study all aspects of our research and look at possibilities for merging different areas onto the same platform. In this case, user interface design is primary element of the research and cultural attributes are secondary elements which should be added into it.

In this article, we firstly try to propose a fundamental design schema for a DVL. Then we introduce the main DVLs which have undergone a deep research on user interface design, and

we focus on part of a DVL, user interfaces for browsing video content, which we call *video summarization interfaces*. After that, we present specific cultural attributes from different studies and try to identify a cultural model which can be comprehensive for a culturally sensitive design. Finally, we discuss the main objectives of our research, and present a *process model* for culturally sensitive design of *video summarization interfaces*.

2. Fundamental Design Schema for a DVL

DVLs are virtual places where videos with various content and duration are stored. Information seeking stages in DVLs are similar to different systems targeted for information presentation (Lee and Smeaton 2002). However, a detailed analysis of the life-cycle model of a DVL can state expressly some design differences. We should also emphasize that these differences occur in the same way for video summarization interfaces.

The reason for creating a DVL differently from information seeking systems is the unique nature of the video medium. Video is a versatile medium, including both audio and visual elements. In addition, because of its linear, single access point nature, video is different from text and because of its visual character it is different from sound. This richness of the video brings up necessity for a different presentation method. Below we present the main design levels of a fundamental DVL (Geisler 2004):

1. Gather: This is the opening page of the DVL. In this introduction to the DVL, user should get an orientation to what is available, and understand how to search a video.
2. Sift: In this stage user has started to search a video. He or she analyzes the search results, refines and narrows the results and selects a video.
3. Evaluate: User evaluates selected video, compares with similar videos and easily returns to sift or re-gather.
4. Use: User uses video and easily returns to sift or re-gather.

In general, for each of four levels of a DVL, different graphical user interfaces are designed. We should remember that user interfaces are not designed in a linear structure like in a book, but they contain a non-linear character and bring opportunity for multi-optional interaction. Therefore, design levels presented above are created from different user interfaces with open access and different paths can be selected during navigation. However, when we take into consideration highly structured data in a DVL, and basic objectives of this kind of systems, we should follow more prescribed routes during navigation. This necessity for limited, clear organized options of navigation is similarly valid for video summarization interfaces.

3. Basic Studies for Video Summarization Interfaces

We browse video content during sift and evaluate stages, and *video summarization interfaces* are prepared for visualizing the summaries of search results. Presenting the summaries of videos shortens the viewing time and increases efficiency of the system. For designing successful *video summarization interfaces* both temporal and spatial presentation should be taken into consideration. There are different techniques for video browsing in DVLs, and each of them directly influences the design of *video summarization interfaces*.

Three determining researches about video summarization interfaces in DVLs are located in Western universities, two in the USA and one in Ireland. Although *video summarization interfaces* of these DVLs had not been designed considering cultural sensitivity, they are presenting deliberately quite similar way of design, and therefore similar cultural characteristic:

1. Fischlar DVL: The most comprehensive research on *video summarization interfaces* in DVLs (Lee ve Smeaton 2002). Because the research is focused on ontological characteristic of video, the design of *Fischlar DVL*'s interfaces is not user-based, but much more dependent to the genre of the videos. In this study, different *video summarization interfaces* are presented according to *temporal, spatial and layeredness* feature of the video, and usability tests are conducted. *Fischlar DVL* presents various *video summarization interfaces* and each of them can be analyzed according to specific characteristics of user interface components, i.e. complex or simple mental models, restricted or multi-optional navigation, limited or customizable interaction.

2. Open DVL: In last studies on *Open DVL*, the influence of the user on interface design has been understood and user interface of *Open DVL* has been re-designed (Geisler 2004). *Open DVL* interface is presenting one summarization technique at once and navigation and interaction are not as complicated as in *Fischlar DVL*, where two or more summarization techniques are used simultaneously.

3. Informedia DVL: This project is focused on news videos, and *search, browse, search results* and *selected videos* are presented in one interface page (Christel and Conescu 2006). Although there are some functionality-based advantages of presenting all these aspects of a DVL in one interface space, there is an obvious disadvantage of using limited keyframe based browsing techniques. Research agenda of *Informedia DVL* is mostly focused on functionality success and less research has undergone for designing usable *video summarization interfaces.*

Considering *video summarization interfaces* of those three DVLs, we can denote video browsing techniques of *Fischlar DVL* as the most sophisticated, and *video summarization interface* solutions as the most complicated. However user interfaces of Open DVL are better designed and much more cosmetic work has been applied. Another result of this analysis is that, when we try to design culturally sensitive designs we should take into consideration summarization techniques and visual appearance together. But first we should decide on the cultural attributes which can influence an user interface design process.

4. Cultural Influence in DVL Interface Design

This paper is grounded in a belief that culture is a discernible variable in interface design practices. Much of the literature on cultural interface design has presented research on internationalization - localization perspective. Conceptual approach is mostly focused on user interface design of websites, and authors have not encountered with any research on culturally sensitive design of DVLs. Caidi and Komlodi (2003) organized a workshop at *Joint Conference on Digital Libraries 2003* about the cross-cultural usability in digital libraries (DLs), and the main outcome of the workshop was the strong need for research on cross-cultural issues in DLs.

One of the issues discussed during the workshop was about the defining of interface design dimensions. Most of the studies investigating cultural influence in user interface design are focused on concrete dimensions, i.e. color, spatial orientation of presented information or language related issues (Barber and Badre 1998, Sears et al. 2000, Aykin and Milewski 2005). However, there are many aspects that need to be addressed. Several studies are borrowing intercultural communication theories to reflect more abstract conceptualizations of culture (Singh 2003, Smith et al. 2004, Marcus 2005).

A key issue that has emerged from trying to add cultural attributes into the life-cycle of interface design process is the need to define a specific method for system developers and designers. We presented five proposals for contribution of culture into the interface design (Table 1), which are comprehensive enough to display the current situation.

Methods	Attributes	Areas	Authors
Pragmatic guideline for information display (GLOCL)	Graphics and icons, Language: rendering and translating, Data object formatting, Color, Layout	Interface design	Aykin and Milewski (2005)
Matrix mapping cultural attributes to user interface components	*Cultural attributes,* individualism vs. collectivism, uncertainty avoidance, power distance, masculinity vs. femininity	Interface design	Marcus (2005)
Cultural (semiotic) attractors and Cultural fingerprint	*Cultural Attractors,* Color, color combinations, banner adverts, trust signs, use of metaphor, language cues, navigation controls, *Cultural fingerprint,* individualism vs. collectivism, uncertainty avoidance, power distance, masculinity vs. femininity,	Websites	Smith et al. (2004)
Three level framework of cultural analyses	*Perceptual level*, spatial orientation, web page layout, text length, navigation modes, translation equivalence, dialects, color categories *Behavioral level,* individualism vs. collectivism, uncertainty avoidance, power distance, masculinity vs. femininity, polychronic vs. monochronic time *Symbolic level,* country specific symbols, icons, color symbolism	Websites	Singh (2003)
Cultural markers	*HTML specific,* Icons/metaphors, colors, specific color, grouping, flag, language, geography, orientation, sound, font, links, regional, shapes, architecture	Websites	Barber and Badre (1998)

Table 1. Cultural models for interface design

One of the resent studies is the proposal of Aykin and Milewski (2005), who described some of the cultural values as abstract, and emphasized the need for conceptualization of culture. However in their study they presented some more pragmatic and concrete cultural values, and a guideline for information display. The proposal of Aykin and Milewski is highly effective for pragmatic solutions.

Another proposal is the theory of Marcus (2005), who presented a matrix mapping cultural attributes to user interface components and tried to match fairly abstract cultural values, which he had borrowed from Geert Hofstede's (1980) well-known theory, with relatively definite design components. The disadvantage of this model is that it needs rigorous testing and much further validation.

On the other side, Smith et al. (2004) conducted a number of usability test and proposed a process model for developing usable cross-cultural web-sites. To set a successful cultural sensitive design they benefit from different methods, i.e. using cultural (semiotic) attractors, investigating cultural fingerprint based on Hofstede's theory and observing local users.

Another theoretical approach is the study of Singh (2003), who proposed three level framework for analyses: perceptual, behavioral and symbolic dimensions. At perceptual level, basic implicit assumptions of the society which are reflected in the web content are studied, and emphasis is on color and language use. At behavioral level the beliefs and values of the society are subjected and emphasis is on cultural values. At symbolic level the web content in terms of signs and symbols of the society is examined and emphasis is on emic understanding of these signs and symbols.

The earliest research is the proposal of Barber and Badre (1998), who identified *cultural markers*, which are design elements embedded in international web sites and should be more prevalent in one cultural group and less prevalent or absent in other groups. Then they presented specific cultural markers which can be cultural and/or genre specific and can then be used to implement usability guidelines.

Although none of the presented methods are directly conceptualized for DVLs, we can select one of more comprehensive ones or we can synthesize two or three of them and present a new cultural approach. The methods of Smith et al. (2004) and Singh (2003) are highly comprehensive and two methods are overlapping in quite a few aspects, but they are not detailed enough. However, Marcus proposed highly reasonable approach of matching cultural values with user interface component, but his theory is not including symbolic level of culture. In conclusion, we should benefit from different theories and try to take the positive parts of them and left the negative ones behind. From all presented cultural models, three different levels appear:

1. Pragmatic level, which is about more concrete issues like color preferences, web page layout, text length, use of language, navigation modes, etc.
2. Symbalic Level, which is about use of metaphors, icons, color symbolism, etc.
3. Behaviaral Level, which is much more about abstract cultural values of the society.

This model is quite similar to the model of Singh (2003), but in *pragmatic level* the guidelines of Aykin and Milewski (2005) and in *behavioral level* the matrix of Marcus (2005) are much more essential.

After we decided on the cultural model of a user interface, we can discuss the influence of cultural values to the DVL components (Fig.1). It is clear that cultural values are not only influencing user interface components of a DVL but also the architecture and functionality of the system.

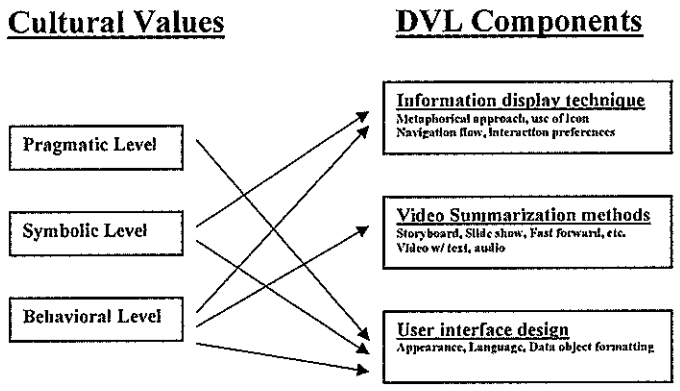


Figure 1. The influence of cultural values to DVL components

People from different cultural backgrounds believe in different symbols and metaphorical meanings. Therefore, a system which can easily translate believes and values should be much more usable. At the beginning of creating a DVL, system engineers and designers are focused on metaphorical approach of the system. This is the conceptual part of the project which effects the whole life-cycle of the design.

Three DVLs, which we introduced above, are using a similar 'desktop' metaphor. However, in their case study about user interfaces Shen et al. (2006) presented a new metaphorical approach for a Chinese target group and usability tests of this research showed positive outcomes. In this study a culture-centered design, which is featuring a 'Chinese garden' metaphor as an alternative of global 'office' or 'desktop' metaphor is proposed. Therefore, cultural influence on DVLs can start just at the beginning of creating the system and it can alternate the system totally. However we should not forget highly structured content of DVLs and that usability of the system firstly depends on quick and easy navigation through this content.

Information display can also be influenced by *behavioral level* of cultural values. Navigation flow and interaction preferences which are closely related to summarization techniques can be modified according to cultural preferences. Different cultures can perceive video films in different ways and prefer different summarization techniques. The advantage of *behavioral level* is that its cultural values are much more abstract and can match different user interface component. We can also set the level of interference by implementing some small differences in the system.

User interface design is influenced by all of the cultural levels. Both concrete and abstract cultural values can be mirrored in *video summarization interfaces*. One of the problems is to decide to which extend these values should be added to the design process. We believe that the level of cultural influence to the design process of *video summarization interfaces* should be set very carefully and the characteristic of DVLs should be in the position of priority. DVLs are storing highly structured data and the success of the system depends on organizing and categorizing collections properly. Therefore, culturally sensitive design should also take into consideration functionality of the system.

We should always implement cultural values of *pragmatic level* into the user interface of a DVL. They can be found in various design guidelines and can be set easily. *Behavioral level* is very important especially when we decide on a summarization technique or combination of techniques. It is also highly significant for navigation flow and interaction preferences, which are much more important for systems with organized content. However cultural values of *symbolic level* are risky for the system with structured data and complicated navigation flow. If new metaphorical approach is implemented, it should not break functionality of the system. Moreover, display of video summaries is leading to visually complicated interfaces, and new icons and symbols can slow down the system.

In conclusion, we should emphasis *behavioral level* as the most significant for cultural influence and try to identify cultural values of this level for targeted cultural group. We can also figure out some symbolic values for targeted culture and not forget that they can bring about some radical change in the system.

5. A *Process Model* for Culturally Sensitive Design of *Video Summarization Interfaces*

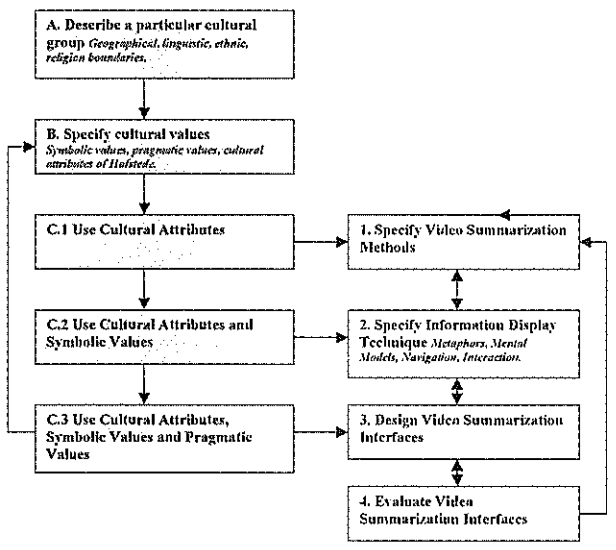


Figure 2. Process Model for Developing Video Summarization Interfaces

In our process model we present a culturally sensitive design of video summarization interfaces, where functionality of

the system is as much important as the cultural contribution. The most important feature of the model is that cultural contribution not only effects the appearance of the interfaces, but also it is seen on the each level of the design project. This is an iterative design scheme, where design process is repeated again and again after usability evaluation. This life-cycle is similar for cultural attributes, where the contribution of cultural values is re-arranged each time. This fine tuning is necessary for the success of the system.

6. A Small Guideline for Designers and Developers

We believe that 'culture' is an important aspect for design process of *video summarization interfaces* and culturally sensitive designs will increase the usability of the systems. This guideline is based on personal experiences of the authors and can be helpful for designers and developers.

For usable design of *video summarization interfaces:*

1. Identify your particular cultural group: Clarify geographical, linguistic, ethnic, religion boundaries of your cultural group.
2. Study the cultural characteristics of your group: conduct usability tests, websites audit, observe users, use guidelines, study the knowledge from different disciplines.
3. Focus on cultural values from intercultural communication theories more than the symbolic preferences of your targeted culture: you can know the symbolic preferences of your cultural group, but cultural values will tell you to which extend you should add these symbols and metaphors into the design.
4. Study video summarization techniques: conduct usability tests for different summarization techniques and combinations.
5. Set the level for contribution of cultural values: Don't forget that functionality of the system is as much important as the cultural contribution.
6. Add cultural attributes on the each level of the design project.
7. Use an iterative life-cycle: Re-design the system after usability problems appear.

Conclusion

The theoretical approach which we presented in this study is not based on cultural-centered design, but is a culturally sensitive proposal, where functionality of the system is as much important as the cultural contribution. In other way, culture is not the main determining factor of the design, but much more a supplementary component. This is a specific situation for user interfaces of the systems like digital video libraries, where highly structured data are stored. Therefore, this approach should be considered just for the similar applications.

Another important output of this study is that cultural influence should not only be seen in the appearance of the user interfaces, but it should be decisive in other stages of the design, i.e. metaphorical approach, navigation flow, interaction preferences, video summarization techniques, etc. We believe that this foresight should be taken into consideration for all kind of GUI applications, which are aiming to add the culture into their design process.

Finally, we should emphasize that this approach is based on personal experiences of the authors and needs implementation, usability testing and validation.

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LEAN DESIGN DISCOURSE: SEARCHING FOR STRUCTURE AND ELIMINATING WASTE IN DESIGN

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Abstract

Lean design discourse represents a systematic approach to design management which conceptualizes design as a flow of work delivering value to the end user. This paper conceptualizes design process as a complex and iterated flow of design tasks and related information. Reviewing the basics of lean design theory, the paper focuses on "structure" of design processes and "waste" in design. Considering the peculiarities of building design, the challenges of lean design in practice are addressed and suggestions are made for future research.

Introduction

Approaches to design may be basically considered in relation to two opposing ends. In the one end, design is viewed purely as an intuitive task and the designer is portrayed as an "artist", a gifted person who produces designs somehow mystically. In the other end, design is viewed as a totally explicable activity. The proponents of this idea attempt to understand design through scientific methods and mathematical techniques. Both of these perspectives have their own theoretical backgrounds and of course, many interesting methodologies may be positioned in between.

This paper takes a systematic approach to design management and discusses the basics of lean design theory. First, three different views of approaching design; namely, transformation, value and flow views are presented. Then, the paper focuses on the flow view and explores the meaning of "structure" of design processes and "design waste" within the framework of lean design theory. Finally, the challenges of lean design in practice, as revealed by the author's previous research, are discussed and suggestions are made for future research.

Lean Design Theory

Lean design theory assumes that there is an underlying structure of design processes and waste in design may be minimized through analysis and optimization. In fact, this theory originated from application of lean production methods to design field. Lean production was first developed by a Toyota team, led by Ohno in the late 1980s. Unlike American mass production system based upon standardization and continuous move of the production line, Ohno prioritized customer requirements, instant delivery and maintaining no buffers or inventories during the production. The term "lean" was coined in 1991 by the research team working on international auto production to reflect both the waste reduction nature of the Toyota production system and to contrast it with craft and mass forms of production (Howell, 1999).

Lean philosophy has later expanded into many other fields. In 1993, the U.S Air Force and the Massachusetts Institute of Technology established a research organization named the Lean Aerospace Initiative (LAI). The initiative defines the term lean as "adding value by eliminating waste, being responsive to change, focusing on quality, and enhancing the effectiveness of the workforce" (LAI, 2007). The International Group for Lean Construction (IGLC) (1993) and Lean Construction Institute (LCI) (1997) were founded to extend lean design and production philosophy to the construction industry. Since 1990s, lean building design research in the construction industry has been proliferated through publications and annual conferences of these organizations.

Koskela (Koskela et al., 1997; Koskela, 2000) pioneered in developing lean construction theory. He conceptualizes building process as a production both at mental level (lean design) and

physical level (lean construction). Due to its scope, this paper focuses only on lean design; aspects of the theory related to site production are out of the scope. Koskela proposes three different perspectives of conceiving building design; namely, transformation, value and flow views (Koskela, 2000) (Figure 1).

Transformation view focuses of conversion of inputs from one state to another (Figure 1a). The basic principle of transformation view is the detailed pre-planning of the design process through optimizing individual task execution. Top-down methods like Work Breakdown Structure are utilized within this view (Figure 1b). Although transformation view has been dominant in project management, Koskela claims that it is incapable of solving the problems of design management since it isolates individual tasks ignoring inter-task dependencies. According to lean design theory, transformation view results in concealed waste generated between continuing activities, rising costs due to buffers between the tasks, and overall sub-optimization of the process at the system level.

Koskela (2000) recognizes that design processes are justified, only if the design product meets user needs. Thus, the definition of client requirements is central to value view (Figure 1c). The lean design theory acknowledges that architectural community appreciates the importance of programming as an early phase defining client needs and requirements. However, the criticism of conventional practices lies in the lack of mechanisms for controlling the extent to which those requirements are realized in design process. Within design, the value view is promoted through requirements capture processes such as quality function deployment (Figure 1d).

Unlike dominant transformation view which conceptualizes design process as hierarchical composition of design tasks, flow view recognizes that design process is a complex and iterated flow of design tasks and related information (Figure 1e). Flow view proposes that reducing design cycle-time is a more appropriate objective for design management rather than optimizing sub-processes. From this point of view, the objective is ensuring the optimum sequence of design activities and minimizing waste. Flow view promotes the use of analytical techniques such as Design Structure Matrix (Figure 1f). The detailed discussion of the basic concepts of flow view is presented in the sections below.

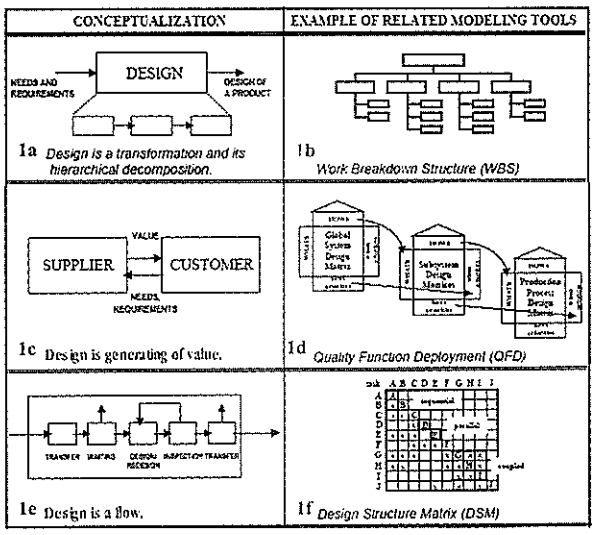


Figure 1. Transformation, value and flow views of design with related modelling tools (adapted from Koskela, 2000)

Searching for "Structure" of Design Process

The idea of understanding the structure of design processes dates back to design methods movement of the 1960s. The movement attempted to bring systematic methods for designers in order to cope with the increasing complexity of design process after the Second World War. During this period, design was explained first time as a rational process composed of several sequential steps. However, the structure of design processes as depicted in early design methods models were rather rigid, abstract and thus, unable to represent the complexity of the actual process (Broadbent, 1988).

On the other hand, lean design's search for structure of design processes has been an inquiry towards "structure of flows." The theory proposed the term "construction physics" to understand the nature of flows and their interactions in building design. Construction physics envisaged design process not as a sequence of discrete activities, but as a continuous flow of highly interrelated activities with great variation. Managing the combined effect of dependence and variation has been a central concept in lean design discourse. Howell (1999) illustrates the problem of dependence and variation in building design through drawing an analogy with heavy traffic on a freeway:

"If every car drove at exactly the same speed then spacing between cars could be very small and the capacity of the freeway would be limited by whatever speed was set. Each car would be dependent on the one ahead to release pavement and variation would be zero. In effect, there would be no inventory of unused pavement. In reality of course, each car does use the pavement released to it from the car ahead but speeds vary. Under the pressure to get to work or home, gaps between cars close and any variation in speed demands immediate response from following cars. As the gaps close, small variations in speed propagate along and across lanes. One small hesitation can lead to a huge standing wave as traffic slows to a crawl. Recovery is difficult because it is impossible to get everyone to accelerate smoothly back up to the standard speed and interval. High speed at any one moment does not assure minimum travel time in conditions of dependence and variation. The idea that you do not get home any faster by driving as fast and as close to the car ahead is counter intuitive (at least to teenagers). Certainly the system itself does not function as well when dependence is tighter and variation greater."

Lean design theory acknowledges that the "physics" of processes are ignored in current practice which tends to focus on more human issues such as teamwork, communication and commercial contracts. In current practice for example, a delay is often attributed to one or more participants being morally deficient. However, the theory suggests that such delays may be due to the combined effects of dependence and variation in a long period. The term "Construction Physics" as depicted above has its basis in queuing theory and inspired by Hopp and Spearman's (2001) "Factory Physics." However, construction physics tends to be more complex than factory physics since many issues that can be ignored or can be assumed to be constant in factory physics, have to be explicitly modelled regarding their tight dependence and great variability in construction (Bertelsen et al., 2006).

Process models are used to extract and represent the structure of design processes. Such models are based on the premise that although designs may be unique in different projects, the process of designing has an underlying structure which may not vary much across the projects. Different types of process models can be used to describe the aspects of the process that are relevant for the purpose and viewpoint of the process model. Since transformation view is dominant in building design management, process models which are based on hierarchical decomposition such as Work Breakdown Structure and chart-based scheduling methods (milestone charts and Gantt charts) are still the most widely used tools. Lean design theory suggests the use of process modelling techniques which are able to represent the dependence and variability in the process. IDEF0, Data Flow Diagrams, and Design Structure Matrix are some examples of these[1].

Eliminating "Waste" in Design

Waste is a difficult concept to appreciate and quantify in building design. Rounce (1998) identified several factors contributing to design waste and showed that they were mainly management problems. Since design management has been a neglected issue compared to management of site production in the construction industry (Pektaş and Pultar, 2006), sources of design waste and means of decreasing it have been rarely discussed in the literature. Lean design theory defines waste as non-value adding activities in the process. Such activities cause loss in resources: time, money and workforce. From flow point of view, the basic source of design waste is unexpected iterations. Design iteration can be defined as rework or refinement, returning to previously made decisions to account for changes (Browning, 1998). Iteration occurs in all design projects due to the nature of the process. However, not all iteration generates value. Iteration occurs in the process either due to an unexpected failure of a design to meet established criteria or an expected response to information which was generated after the previous iteration was completed. The former is called unexpected iteration and the latter is called expected iteration (Smith and Eppinger, 1993). Differentiation between unexpected and expected iteration is increasingly being recognized in design management. Browning's (1998) "intentional/unintentional," Clausing's (qtd. in Browning 1998) "disciplined/dysfunctional,"

[1] Further information on process modelling in building design can be obtained from: Pektaş, Ş. T. (2003) Representing Information Flow in Building Design Process Using the Parameter-based Design Structure Matrix. Ph.D. thesis, Bilkent University.

and Ballard's (2000) "positive/negative" categories of iteration address the same two types.

Expected iteration usually results from downstream activities (particularly verification and validation activities) revealing aspects of upstream activities that must be reworked. Typically, some of the design decisions are made even though the information needed to complete them fully is not known. As this input information becomes available, the tasks are repeated and the product comes closer to meeting the design specification. Clearly, expected iteration is natural and value-laden. On the other hand, unexpected iteration results from failure to converge to design requirements. Such insufficiency in the design is more likely to occur when specifications and objectives are unstable or prone to change. Unexpected iterations also arise from new information arriving late in the process (caused by out of sequence activities, mistakes, miscommunication, etc.) (Smith and Eppinger, 1993).

Although waste management is very important for conducting efficient processes, it is a difficult task. The first step towards reducing design waste lies in minimizing unexpected iterations. This necessitates ensuring that the right information is available at the right time in the process. There are a number of techniques for managing iterations such as the design structure matrix, team problem solving, cross functional teams, shared range of acceptable solutions, shared incomplete information, reduced batch sizes, team pull scheduling, concurrent design, deferred commitment, least commitment, set-based vs. point-based design, and over design (Ballard, 2000).

Challenges of Lean Design in Practice

Lean design theory generated wide interest among academicians and in the industry. In order to enable the implementation of lean design principles in practice, a design management tool called Last Planner was developed in 1990s (Koskela et al., 1997). Last Planner is a tool for measuring planning system performance. In this system, the person or group who conducts planning is called the "Last Planner." Planning performance of the Last Planner is measured in terms of the amount of percent plan complete (the number of planned activities completed divided by the total number of planned activities expressed as percentage). It is envisaged that analysis of items which did not conform to the plans, would help to identify the underlying causes of waste; thus, improvement could be made in future performance.

The Last Planner system was later integrated with Design Structure Matrix (DSM) method and the resulting tool was called DePlan (Choo et al., 2004). Lean design methods and associated tools facilitated for reducing design cycle time, minimizing waste and maximizing value in many projects (Koskela et al., 1997; Koskela 2000; Choo et al., 2004). Since advantages of lean design have been well documented in the literature, this paper focuses on the challenges. The author of this paper did research within the framework of lean design theory and implemented two case studies (Pektaş, 2003). The details of the case studies were published elsewhere (Pektaş and Pultar, 2006). The following observations about the challenges of lean design in practice has been derived from the author's personal experiences and supported by the related literature. Most of the issues discussed below derive from the peculiarities of the construction industry and can be generalized to other design management applications as well.

Koskela (2000) classifies the significant peculiarities of construction into three major categories: One-of-a-kind nature of building designs, site production, and temporary organizations. Unlike manufacturing industry which produces millions of products with the same design, construction industry ought to produce a unique design for each project as a response to different requirements of the clients and sites. One-of-a-kind nature of building design increases the level of uncertainty and renders process monitoring difficult. Construction production is typically conducted on the construction site which causes strict dependence on the resources of the construction site. This characteristic of construction also adds to uncertainty and complexity of construction compared to stationary production. Finally, a construction project organization is usually a temporary organization assembled for the purpose of the particular project. It consists of different design professionals who have not necessarily worked before. Temporary nature of organization also challenges effective design management.

Koskela (2000) suggests elimination or mitigation of such peculiarities in order to get rid of their shortcomings. He

proposes that the most basic solutions to these problems are at the systems level. In order to alleviate the problem of uncertainty, he recommends optimizing the sequence of design tasks using analytical techniques; prefabrication, modularization and preassembly to reduce the effect of high variability; and procurement strategies -such as the French sequential procedure, where there is always one company working on the site- to handle difficulties of temporary organization.

The author of this paper agrees with Koskela (2000) about the definition of three peculiarities of construction which hinder effective design management. However, the author's field studies (Pektaş, 2003) revealed that the challenges of the construction industry in this respect are not confined to Koskela's framework. The following issues should also be considered.

Fragmentation of the Construction Industry

The construction industry -unlike other large industries, such as the automotive, aerospace, and the electronics industries- is fragmented into numerous small organizations. Temporary nature of organization in construction projects is one reason for fragmentation. Another factor is the growing complexity of building processes, which promotes increased professional specialization. Specialization is also reinforced by educational practices and socio-economic trends that reward excellence in ever-narrowing fields. It is observed that the larger organizations in other industries have higher profits that enable them to invest larger sums of money in design management. Furthermore, other industries have a few key organizations that can drive a technology to suit their requirements. As a result, while several related industries, such as automotive and shipbuilding manufacturing, have been relatively successful in integrating lean design into their operations, the construction industry continues to fail in this development.

Lack of a shared Understanding of Objectives, Values, and Processes

Shared understanding is a mutual view among the design participants on relevant design topics and design activities. Without this understanding, decisions will not be supported by all team members and later activities in the design process can be restricted by different views of the team members. Having a common understanding of information content of design entails shared process models. In the construction industry, there are no established standard models of design process. The situation of building design process modelling is similar to that of building product modelling approximately a decade ago. There are several attempts from different sources, but the existing models tend to be incompatible and fragmented. This fragmentation has forced, for example, European Commission research bodies to propose integration projects. ICCI (Innovation, coordination, transfer and deployment through networked Cooperation in the Construction Industry -IST-2001-33022) is a clustered project that aims to establish such a common platform for process modelling (Rezgui and Zarli, 2001). However, it seems that the construction industry needs some more time to fully agree on a standard model.

Informal Communications, Invisible Decision Making, and Lack of Documentation

Lean design practices require enormous coordination to ensure that all parties are constantly aware of the ever-changing status of the project in an attempt to eliminate design errors. However, in current processes of the building design professionals, communications are often informal and not documented. The lack of documentation is a difficulty for lean design researchers as well. In the lean design research from product and machinery design field, the researchers had benefited significantly from the documentation of the participating design organizations. However, in similar studies from building design field, it was observed that such documentation was very limited, if it existed at all. Moreover, it is also evident that in conventional building design practices, the communications between design professionals is often at such a minimal level that the documents can only provide the most basic level of information. Even when the plans reflect the design process with absolute accuracy, the decision making that led up to specific configurations remain invisible. This becomes a significant disadvantage when alternative solutions are searched in the process (Pektaş, 2003).

Cultural Resistance to Design Management

The increasing complexity of building design processes has been forcing design professionals to improve their processes in terms of time and quality. However, systematic design management is still not considered in many building projects. This is partly due to the common misconception of some designers that design, being a creative process, cannot be planned effectively. Even when planning is done, it is

performed intuitively, ignoring the flow of interdisciplinary information. Similarly, relatively little research has been made on the management of the design process compared to production management in construction. Cultural resistance to design management seems to be a persistent barrier against lean design practices (Pektaş, 2003).

Lack of Systems View in Building Design

Lean design practices promoted a systems view of building design. According to systems analysis, a system is an assemblage of components formed to serve specific functions and subject to constraints. Thus, a system comprises some essential and interrelated components. Each component contributes to the performance of the system in serving the specified functions and the performances of components affect each other. A building is a good example for a system according to this definition; since, it comprises many essential components designed to meet certain needs. Moreover, the parts of a building must be fully compatible and are highly interdependent (Merrit and Ambrose, 1990). However, author's field research revealed that even experienced building design professionals lacked for a systems view to building design. The participants of the field studies responded to lean design theory very positively, because it made them think from a systems point of view (Pektaş, 2003).

Conclusion

Lean building design is a well-founded theory of building design management. Koskela's definition of three views of building design provides a sophisticated framework for understanding existing design management applications in the construction industry. This study explored the "flow view" of Koskela's theory and discussed its basic components. Although lean design represents a solid theory, it faces several challenges in practice. This study contributed to reveal some difficulties of building design industry for embracing lean design, in addition to Koskela's argument. It is hoped that awareness of the obstacles would facilitate for overcoming them. Further research should be done to ensure better adaptation of lean design principles in practice.

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CULTURAL PRODUCT DESIGN

Dr. Irini Pitsaki

Abstract

The paper emphasizes that the understanding of design ought not to be limited to contemporary specialties of design, seeing as professions and conceptions of design are evolving steadily with social and technological advances. In order to introduce the new concept of cultural product design, design is considered as a process undertaken by cultural organizations, such as museums and publishing houses.

A cultural product can be defined as any product that arises out of a creative and/or intellectual act and then is exhibited or reproduced in multiple copies and offered to concrete markets - audiences. Some examples of cultural products are: books or book series, painting exhibits, theatre performances and multimedia productions. This is a general definition that may be adapted to suit an organizational -profit and non profit- context and broadened if we assume a marketing perspective, wherein a product is defined as a set of benefits that the consumer perceives through consumption. According to this description, a cultural product is a set of tangible and intangible benefits perceived by someone who reads a book, sees a film, or visits an art exhibit.

In any organizational or business context, design is at the heart of product development. If we conceive of this as a process, and if we agree that a product is a composite of benefits, as marketing suggests, we can then argue that in the case of cultural products, design consists of conceptualizing and projecting onto material "forms" the composite of benefits that a person perceives through the acts of reading or viewing an art exhibit. Here, we adopt a notion whereby design is a process of projection that employs technical elements in the creation of material forms that may be handled and/or viewed. These forms may be written documents, images or objects through which ideas, intentions, values, or messages are projected. We understand design, then, as a process of tangible or intangible product prefiguration, and as a means for activating the perception of a composite of benefits. It is, in other words, a channel that carries an acquired cultural experience. The design of a cultural product, then, must be carried out in a manner that carefully considers when, where, and how it will be offered to the public, as well as the specific circumstances of its consumption.

Several "existent" concepts of design will be reviewed to explicate the study's take on the meaning of cultural product design. More specifically, by taking the publishing house as an example, the aim is to define the distinct specialties of modern design therein as follows: publishing graphic design, service design, experience design, and cultural design. Finally, cultural product design emerges as a process that combines these design and product concepts.

Cultural Product Definition

In the literature of cultural studies, the concept of the cultural product is determined through a perspective of art and its marketing.[1] There are numerous definitions that vary in the marketing criteria established for product classification, or the artistic-creative dimension of the disciplines out of which cultural products arise. What exactly do we mean by *creation* or *art*? In 1989 the United States Congress, and in 1993 the Art Committee of Great Britain defined the term "Arts" as (Hill O'Sullivan C. and O'Sullivan T., 1995:1):

[1] "Cultural marketing can be summarized as a process of determining which of the cultural products, services or ideas offered are demanded by specific market; establishing certain quantifiable marketing objectives; developing a cultural product for which there is demand; communicating and distributing the cultural product; determining whether the objectives have been met" (Codina Mejón J., Cristóbal Fransi E., Torzón Jahansson A., 2004: 125-6).

> The term of *Arts* includes, but is not limited to, music (instrumental and vocal), dance, drama, folk art, creative writing, architecture and allied fields, painting, sculpture, photography, graphic and craft arts, industrial design, costume and fashion design, motion pictures, television, radio, tape and sound recording, the arts related to the presentation, performance, execution of such major arts forms, and the study and application of the arts to human environment (Art Committee of Great Britain: 1993).

According to this definition, and from a cultural marketing perspective, experts in the field seem to agree that "cultural products are products that derive from a creative and/or intellectual act" (F. Colbert & M. Cuadrado, 2003: 17). On the other hand, the prestigious scholars Phillip Kotler and K.L. Keller (2003: 3-4) affirm that a product may be any good, service, experience or idea that individuals can value, acquire, experience, or possess. By combining these beliefs with the findings of Hill E., O'Sullivan C. and O'Sullivan T. we can come up with a few examples of cultural products: a dance or theatre piece, a book in a book series, a painting exhibit, a movie or a television program.

From an analogous perspective, C. Lorenzo Romero and M. P. Martinez Ruiz (A.I. Jiménez Zarco, 2004: 207), suggest that products may be classified into three major groups, depending on their tangibility or intangibility: physical good, service or idea. The borders between these three categories are often blurred, and the product ends up being understood as the composite offering of benefits; an offering that emerges as an amalgam of these three concepts. In other words, though it may be possible to separate goods by classifying them as material goods or services, these concepts co-exist and interact in most products. The same occurs with cultural products: although some come closer to the idea of a service – for example a theatrical work or an exhibit – others, because of their mediums and formats, are more comparable to material goods, such as CDs and books.

Now let's take a closer look at the example of books. The book is, in part, an object that may be acquired. However, its intangible dimension is always its more important aspect. A good book contains a good written work in it, which may provide enjoyment, knowledge, or reflection. The major benefit perceived by a book's "consumer" is the act of reading: when we buy a book, we buy moments of reading. In this sense, the generic definition of a product in the marketing world, as a "set of benefits perceived by the consumer" (F. Colbert and M. Cuadrado 2003: 45), seems easily applicable and well-suited to cultural products. What the public perceives through the consumption of a cultural product is largely a set of intangible benefits, which are impossible to possess without the experience acquired. The significance of the co-existence of this intangible dimension leads to a new viewpoint whereby cultural products seem like true experiences or services.

With respect to the rest of products, there are four basic attributes[2] that qualify cultural products and highlight their unique nature. According to Hill E., O'Sullivan C. and O'Sullivan T. (1995: 102-03), these are:

a) intangibility (any cultural product is, for the most part, a service and an experience, something intangible)

b) heterogeneity (the product is different every time it is offered, just as people's individual experiences are)

c) simultaneity in the production and consumption of the good (services are offered while they are "being consumed" by individuals), and

d) ephemera (if one is not in the right place at the right time, for example, at an opera performance, it is impossible to acquire the experience).

To this list of attributes Grande (1996) adds one more item: the impossibility of possession. A cultural product such as a theatrical work or art exhibit cannot be possessed or stored. Like Hill E., O'Sullivan C. and O'Sullivan T., Grande (1996) sees cultural institutions -such as museums- as service organizations and "suggests classifying services related to sports, the arts and entertainment according to the system established by the American Marketing Association (1985). It

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[2] In the sense of: "Quality or property". Real Academia Española. (1992). *Diccionario de la Lengua Española*. (21ª ed.) Madrid: Espasa Calpe.

is difficult to define a museum's "service" because the museum experience includes not only the objects themselves but also how they are presented and interpreted, as well as the physical characteristics of the building. All of those factors affect the visitor's perception" (Codina Mejón J., Cristóbal Fransi E., Torzón Jahansson A., 2004: 127).

Another way of describing cultural products is by examining how an artistic and/or intellectual work originates a good to be offered to the market, along with the roles that cultural organizations[3] play in their interactions with them and their creators. The question we arrive at, then, is how, and under what circumstances, are these works deemed as products? Cultural organizations adopt different "roles and functions that address everything from the product's design, production and reproduction to its distribution, maintenance, and conservation" (Colbert F. and Cuadrado M., 2003: 17). Addressing cultural products from a company perspective is quite different from referring to an author's work, or what the creator originally offers. Organizations are the creators of cultural products in the sense that they gather the intellectual and artistic work and present it to the public in an appropriate way.

We can easily see how this belief applies to the concrete case of publishing. The purpose of a publishing house is to make the work, or the text, appropriate for circulation in the publishing market. "The graphic arts and publishing sector is made up of companies that carry out the various operations necessary to transform a creative work into a fabricated product ready for distribution" (VV.AA., 1997: 101). A novel, for example, may be written independently and personally, based on the author's criterion. But the publishing house can give it shape and include it in a book series developed for a specific readership. The work (the novel) then becomes a product with multiple additional aspects that complement what its creator originally produced. These attributes may be tangible (format and publishing graphic design) or intangible (associated values, i.e. brand values). For example, the work may acquire values that derive from the corporate image[4] of the publisher or book series in which it appears, just as a painting may obtain added symbolic values when it is exhibited in a prestigious museum as opposed to an unknown art gallery. Thus, in cultural product launches, the use of brand strategy has a catalyzing function: the presence of the brand makes the product less abstract, an in some way, "tangible." Because of this, corporate and product brand strategies are very useful in the case of cultural products.

Another important role for the cultural organization is that of intermediary between the creator and the market. In this case, the objective is giving the work access to the widest possible audience, or to a smaller but specialized group. Diggles (1986), as well as other authors in the field of cultural marketing (i.e. Mokway (1980), Reiss (1984), or Melillo (1983)) affirm that for a company "the principal objective is to give the right number of people the right kind of contact with the artist, and do it in such a way that produces the best possible result compatible with the object at hand." In this sense, what the company does is invite the public to get to know and appreciate a work. Diggles' argument holds within it some key ideas: organizations are not only intermediaries that manage the relationship between creators with their audiences; rather, in this process, they are actually responsible for ensuring that this contact is carried out in such a way that allows the individual to appreciate the work. In other words, the company is responsible for achieving what the creator set out to do with the original work.

Generally speaking, organizations can play different roles as they adapt the works for presentation as products in the market. These roles vary by the situation and the degree to which the author takes advantage of the structures and advantages that the organizations provide. Other influential factors may include the company's size, structure, activity and function. If we apply this argument to the publishing world, we realize that large

[3] Throughout the study, the words company, corporation and organization are used synonymously. For the context of the cultural industries, the word organization is considered more suitable, because it includes non – profit institutions.

[4] Here we refer to corporative identity and corporative image, brand identity and brand image. How are they different? (...) Identity is what we emit (what we are and what we declare we are), whereas image is a perceived message (how they see us, how those manifestations are perceived and evaluated by a series of audiences or target groups). In other words, identity is a set of manifestations, whereas image is a set of perceptions (Arranz, J.C., 1997: 29).

corporate publishing houses and small or independent ones face very different circumstances. The former can use forms of mass communication and promote its works through mediums like television and radio. They may also use international distribution networks to contact foreign publishers and promote translation and commercialization of the work in different languages and countries. In this case, the potential market to which a company directs itself is considerably greater than that which a small independent publishing house can cater to. To conclude, we may corroborate with Colbert F. and Cuadrado M. (2003: 41) in that the definitions of the concept of the product may be arrived at from different perspectives and "different business strategy positions."

The Design Perspective

In the previous sections, we have affirmed that cultural organizations are responsible for the development of cultural products. In other words, they are the ones who prepare and appropriately gather works to later offer to the market. On the other hand, in any business context, design is at the heart of product development. Thus we may pose the following question: What role does it play in the case of a cultural product? To answer this question, we must describe product design and examine how it applies in this specific case.

Product design is the activity of creating all kinds of products and must be recognized as an extension of industrial design: while industrial design concerns physical goods, product design lies within the area of the design of any product, be it tangible (objects) or intangible (services). This manner of categorizing products helps us clarify the relationship between industrial design and product design. Let's take a closer look at the nature of design in each case.

"The concept of industrial design was initially developed by Mart Stam in 1948. Stam understood industrial designers to be those project developers who worked for the industrial segments in any field, but particularly in the creation of new elements and materials" (B. Bürdek, 2002: 16). These "new elements and materials" referred to production goods and industrial components. The concept of industrial design then evolved to mean the activity out of which physical products arise, i.e. objects, generally recognized as material or consumer goods. Thus, industrial design was understood as the process of creation of tangible and manageable goods, later focusing on their communicative functions: "Horst Oehlke (1978) responded to product communication theory by noting that the creation of an object did not merely refer to its parts that are perceptible to the senses; rather, the creator ought to also address the resources that can satisfy the needs of groups or individuals". Ten years later, a composite approach to design was developed that included three dimensions: "practical and/or instrumental utility, social communication and sensorial perception" (B. Bürdek, 2002: 16).

Another key aspect is that the concept of design in general, and industrial design in particular, was soon linked to serial production and mass consumption:

"Industrial design is, basically, 'the operation of conceiving, devising and developing an object, independently of the means that will later give it expression, and before commencing its production'. In this sense, the term industrial, linked to the concept of design, limits its applications to the conception of objects for their serial industrial production. For this reason, the concept of industrial design is intimately tied to the Industrial Revolution, and moreover, to the concepts of serial and mass production.

Among the numerous existing definitions of industrial design, we will discuss the one used by the International Council of Industrial Design, based on the ideas of Tomás Maldonado. According to the International Council, industrial design involves coordinating, integrating and articulating all the factors that in some way or another participate in the constitutive process of the formation of an industrial product, within the conditions that determine the conditions of production in a given society' " (J.M. Ibáñez Gimeno, 2000: 2). However, products are not always objects; they can also be services or experiences, as is the case of cultural products. Thus, design, as part of its development, does not exactly correspond to the definition provided above, because the nature of the product is not limited to its material characteristics. In these cases, we use the term *product design*, which, in this study, denotes a concept broader than that of industrial design[5].

[5] Often, in the existing bibliography, the term product design is linked to physical products, which further shows that the conception of this term is broader than that of industrial design.

From an analogous perspective, various academics focus on evaluating how design interacts with development processes for products similar to cultural products. Specifically, Bill and Gillian Hollins worked with the concept of services as products that can be designed. Their opinions are based on the simple reasoning whereby services constitute products, and thus, must be designed. In order to describe the process of a services design they compared them with manufactured products. What they concluded was that in the process of object design, careful attention is paid to the materials that will be transformed into tangible products. However, for services, the emphasis is put on the moment of production, which is customarily concurrent with consumption, and necessitates the involvement of the consumer (Hollins G. & Hollins B., 1991: 14).

This circumstance forces us to rethink existing design models, in order to introduce changes that may make them applicable to services. Design, as understood by the industrial design, tends to involve various phases and sequences of action. Let's look at an example: In *Design Management: Using Design to Build Brand Value and Corporate Innovation*, B. Borja de Mozota (2003: 15) describes the phases of design as they appear in the chart below:

PHASE	OBJECTIVE	VISIBLE RESULT
0. Preliminary research	Idea	Brief
1. Research	Concept	Visual concept
2. Exploration	Determination of style	Sketches, initial models
3. Development	Prototype details	Technical drawings, functional models
4. Execution	Test	Documents of execution Prototypes
5. Evaluation	Production	Product description

Design here is understood as a process and sequence of actions that involves the planning, prefiguration and specification of the material aspects that engender the perception of the set of benefits offered to the consumer; in other words, the product. The final objective of each phase of design is to produce a "visible" result (B. Borja de Mozota, 2003: 14). This could be an instruction manual, a list of concepts, a sketch, a manual of technical specifications, the description of a process, a test for quality, an illustration, or an object, among other things. If the purpose of the design is to create an object (a tangible product), the result of one phase will be a sketch. If, on the other hand, the purpose is to offer a service or experience (as is the case with intangible products), the result of the prefiguration will be a document that describes them. "Design is a technical-creative activity through which something is prefigured before being created. Therefore, it is essentially an intellectual activity that consists of selecting expressive media and adopting the processes of elaboration" (A. Calvera, 1997: 90).

The model proposed by B. Borja de Mozota suggests production as the final objective of design, and product description as a visible result of the evaluation stage. If we recall what G. Hollins and B. Hollins (1991) presented in their book, *Total Design: Managing the Design Process in the Service Sector*, we would agree that any service design model must go beyond the mere description of the product to be fabricated. This is further justified if we consider that production, in the case of services, is not followed by storage, nor prospective distribution, since the product's intangible nature intrinsically impedes this. Another reason is that the product will be acquired, valued and "consumed" by individuals at the same time it is produced. Design is then the factor that determines both the moment in which the product comes into contact with the consumers, as well as the experience acquired through its consumption. G. Hollins and B. Hollins (1991: 11) conclude that, as opposed to physical goods, service design must be considered beyond the manufacturing of the product to include implementation, subsequent improvement and disposal, as well. Still, a great number of factors may be included under the broad heading of disposal.

Combining all this with the notion that cultural products tend to be seen as services helps us imagine how the scientific-technical knowledge of design may apply therein. Furthermore, if we think of cultural products as experiences, we can make another interesting comparison. Experience design is a specialty of design that has received tremendous attention in recent years, and works to combine its functions with those of marketing. It involves design that carefully considers the situations in which individuals interact with the brands or products being commercialized. In the case of cultural products, we can argue



that design and marketing collaborate to make experiences at bookstores or art exhibits completely unique and memorable. Below we'll analyze the concept of experience design applied in the case of cultural products and, more specifically, books. Publishing paradigms will also be used for another interesting specialty, that of cultural design. In short, to approach the concept of *cultural product design*, we'll introduce the different design concepts applicable to a publishing house; concepts currently accepted and defined by design scholars, and which give rise to the new composite concept of cultural product design, and consequently, to a new space for reflection upon the discipline of design.

TOWARDS THE CONCEPT OF CULTURAL PRODUCT DESIGN: Design in the Publishing House

Publishing Graphic Design

Graphic design is the specialty of design most widely recognized in today's publishing world, in the sense that its communicative function is well perceived. It deals mainly with the act of handling and adjusting the formal aspects of the written works; in other words, devising the transformation of a text into a book. Publishing graphic design "visually organize" the text "in a way that satisfies the intention for which it has been created" (A. Calvera, 1997: 84). The designer "uses various graphic elements" such as "typefaces, the control of the space, the chromatic system and its synergy, the capacities of the image and the potential of style", using his "expressive capacity to serve a communicative objective" (A. Calvera, 1997: 90), that of reproducing and transmitting the work to the readers.

Today, according to the modern conception of the profession, publishing graphic designers handle the cover and the interior, that is "the projection of the book as object, therefore working with formatting, paper type, the color of the text in relation to the color of the paper, the binding, the selection of the typefaces according to the content of the book, the definition of the extension of the text with respect to the page, the positioning of the page numbers, the margins, the visual character of the illustrations or photographs that will accompany the text, etc." (B. Munari, 1983: 33). However, the communicative and aesthetic functions of graphism have practically monopolized the interest of designers, editors, and scholars. A publishing graphic designer, then, is expected to resolve the issues of aesthetics – expressed through graphism – related to the content of the work, such as typographic structure and the comfort of reading. Ron Costley[6], an English designer for the publishing houses Scolae Press, Chatto & Windus, and currently with Faber & Faber explains:

> My primary concern is to present the text in the simplest possible way, such that the reader can directly access the author's text without being interrupted by my intervention. When I design a book, I try to structure the text with the typographic repertoire at my disposal but without any element beyond what is necessary (R. Hendel: 105).

As Ron Costley notes, aside from paying attention to the simplicity of graphism, before making any decisions, the publishing graphic designer must reflect on several key aspects of the work:

- **"Origin:** if the work comes from an author, or if it is a publishing idea, translation or adaptation.
- **Type:** if it is a work of literary, journalistic, scientific, educational, humorous, or scholarly nature, etc.
- **Function:** if it is for mass distribution, for educational, professional or didactic purposes, or reference material.
- **Characteristics of content:** if it will include graphs, tables or pictures; if the size and the quantity of images is important; if the amount of text requires special consideration, etc.
- **Type of reader:** if the reader belongs to certain cultural, social or professional group.
- **Reading styles:** if it is meant to be read once, or consulted multiple times; if will be taken to school or on trips; or if it is meant to be enjoyed in the comfort of one's own home" (L. Mazzalomo, 2002: 147).

Publishing graphic design is, then, a process that helps shape a work based on text – or combined with images and sound, in the case of multimedia publications – with the composite elements' communicative functions in mind; in other words, the typeface, the illustrations, or the blank spaces. Similarly,

[6] Ron Costley has been interviewed for this research.

the publishing graphic designer ought to consider: a) the kind of reader (who will read it?) and b) the kind of reading (how and when will the book be consulted?)

Book design was always seen through the lens of graphic design, mainly due to its use of paper as a medium and its connection with typography. However, book design is much more than publishing graphic design, which by definition encompasses only two dimensions. Really, a book is a complex three-dimensional form. It is an information medium as well as an object. And above all, it is a product that stands out for its cultural character. A book designer is more than a graphic designer; he or she must make decisions regarding the book-as-object (industrial design), or the book-as-information-medium (information design), and the book as experience (cultural product design). We may conclude, therefore, that aside from graphic design, there are other design specialties that may be perfectly applicable in the case of books and publishing products in general. We'll now turn to look at some of these, in order to arrive at a definition of the concept of cultural-publishing product design borne out of a broader design perspective.

Service Design

In recent years, service companies have radically multiplied, as a result of the introduction of digital technologies and the use of the internet as a business platform, among other reasons. Consequently, design, with regard to service marketing and management, has caught the attention of many professionals and academics. Bill Hollins, Professor of the University of Westminster observes:

> "Services are products. Products need to be designed. Design is a process. This process must be organized. This organization is the job of management" (G. Hollins, B. Hollins, 1991: 3).

Services are comparable to manufactured products. They should be designed with regard to their dual nature: "tangible and intangible. It can involve artifacts and other things including communication, environment and behaviors" (B. Hollins, 2005: 1). Philip Kotler (1986) defines services thusly:

> "A service is any activity or benefit that one party can give to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product" (G. Hollins, B, Hollins, 1991: 7).

As we found above according to a cultural marketing perspective, and depending on their tangibility or intangibility, cultural products tend to be seen predominantly as services. A painting exhibit is in itself an intangible product, because it involves the entire experience valued as a benefit; in other words, the visit, the museum environment, the originality of the work, and the knowledge acquired, among other factors. One may argue, therefore, that service design attempts to determine what the service is, and in some ways, embodies the essence of the cultural product. Even so, a large part of what is perceived through attending an exhibit is tangible: the paintings, the exhibit catalogues, the museum building. This is because in reality, the three cited categories (physical good, service and idea) tend to blur in such a way that the product is ultimately defined by the offering of benefits provided through the combination of all three factors.

It follows, then, that service is a weighty component of any product. This assertion brings us to a new dimension of service design: that which takes into consideration the manner in which a product will be offered to the public. The introduction of brands in the commercial world, and the need to create a positive image for them, have made "how" a good (tangible and/or intangible) is offered a basic concern for companies. "Service design can be applied at all these stages where customers interact with the organization" (B. Hollins, 2005: 4), and the quality of the service according to Berry, Zeithml and Parasuraman (1990) depends on five parameters related to design:

- "Tangible dimension – the appearance of physical facilities.
- Reliability – the ability to perform the promised.
- Responsiveness – the willingness to help customers and to provide prompt service.
- Assurance – the knowledge and courtesy of the employees and their ability to convey trust and confidence.
- Empathy – the provision of caring, individualized attention to customers" (B. Hollins, 2005: 27-28).

Thus, service design in the case of books, aside from the cultural product dimension, ought to consider the routes of distribution (how the book comes to the reader), the quality of the packaging (in what state), the commercial labor (which books, and what information on them is distributed to bookstores), the role of the booksellers (what they know about the work and how they serve the customer), and the details of informative magazines or personalized services for club members. In service design, therefore, the responsibilities of the editor, marketing director, sales director, and other publishing professionals, all come together. The needs, approaches, and levels of responsibility that everyone involved has in service design, will all change depending on the type of book or book series, the organizational structure and the distribution channel chosen.

Experience Design

Here, the book is examined as an experience, in the sense of "the set of benefits obtained" through acquiring and reading a book. What one buys in a bookstore or in a newsstand is, more than anything, a new and sought-out experience. Therefore, new cultural product design and marketing ought to carefully consider the conditions of the product's consumption: Where, when, and how will the work be read? In this sense, publishing product design becomes experience design.

Ralph Ardill (2004: 1-3) defines experience design as:

> "Experience design is therefore driven by consideration of the moments of engagement between people and brands, and the memories these moments create. Experience design is not driven by a single design discipline but instead requires a truly cross-discipline perspective that considers all aspects of the brand/business – from product, packaging and retail environment to the clothing and attitude of employees. Brands that deliver great customer experiences also reward the customers for time, money, energy and emotions they invest in transacting with them above and beyond the delivery of their products and services.

For instance, consider the task of redesigning a Sunday newspaper. A conventional approach might be to employ graphic designers who would change the page layout and typeface and make recommendations on how photos should be shot. However, if the redesign were to use an experiential approach, the experience designer would first consider the 'moments' of engagement of buying the paper and reading it. How is it bought or delivered? How is it read and disposed of? What does the reader like and dislike about 'using' the newspaper? Such an approach is more likely to lead to a radical and market-beating innovation".

Ardill proposes that a basic function of experience design is to guarantee to the highest degree that contact with the product and brands will generate value. Like Kevin Lane Keller (2003: 13), Ralph Ardill believes that value resides in – and depends on – the memory of the individual, and, in this specific case, on the memory of the experience acquired, along with his or her previous experiences with the same brand. As an integral part of the product development, experience design attempts to make this memory a positive and favorable one. Thus, the product and/or brand are understood as an open system that interacts with its environment and with individuals, in order to suggest a lifestyle to them, and to create solid and long-lasting relationships with them.

Other terms surrounding experience design are: "Customer experience design, experiential design, brand experience" (Ralph Ardill, 2005: 1), emotional marketing and aesthetic marketing. If we consider design as a process that produces physical results, we will come to understand experience design as an element that generates sensory experiences (visual, acoustic, tactile and olfactory). For a product or brand, sensorial experience design is a means of creating aesthetic value, because "aesthetics is one of the main factors of satisfaction in the world of consumers" (8. Schmitt, A. Simonson, 1998: 42). In their work, these authors introduce the term "aesthetic marketing" to refer to "the commercialization of sensorial experiences offered by the corporation or the brand," experiences that contribute to the creation of their image (B. Schmitt, A. Simonson, 1998: 39). They also argue that aesthetics is of great importance for brands because it generates loyalty, justifies high prices, and helps highlight the product or brand among a zoo of information, protect it against attacks from the competition, and guide productivity (B. Schmitt, A. Simonson, 1998: 42-44).

The graphic aesthetic value of books is a factor that editors very much appreciate, though it is often reduced to a general concern with the cover and the differentiating effect that it may have at the point of sale. Graphic design contributes to the understanding of sensorial experience design in publishing, but it needn't be limited to this aspect alone. The reader's sensorial experience begins the moment he or she enters a bookstore, and ends when he or she has read and bought the book, and placed it on the bookshelves at home. Sensorial experience design encompasses everything from the bookstore's interior design and smell, to selecting the paper by focusing the sensation that it will produce upon touch, or the sound the pages will make when turned.

On the other hand, we must pay attention to factors other than the desired aesthetic experience: factors including everything from the bookseller's behavior and recommendations to the moment in which the book is read. With respect to these instances, we may argue that, unlike other cultural products, books have particular qualities that must be considered. A book is normally not read just once, or in places predetermined by the editor, as is the case with theatrical works, which are viewed for two consecutive hours in an environment chosen by its creators. This idea is applicable in the case of book series, in which the experience acquired transpires throughout the course of time, with total irregularity. Even so, the reading experience designer ought to consider the various possible conditions of consumption that may be pertinent, seeing as, for example, the conditions surrounding reading a novel and a guide book will differ considerably. Let's look at some examples.

I recall a student in a postgraduate publishing course at the University of Barcelona who designed a book series of short novels to be read in the bath. The idea arose out of thinking about how and where they would read; not by predetermining certain characteristics of the content, as is customary. The chosen texts, materials, and techniques had to be suited to the occasion, and the printing inks had to be impermeable. Another example of experience design, rather more conventional, is that of pocket edition design. This format evolved based on the type and the moment of reading; the product had to be light, small, and manageable. Both the texts and the materials had to suit "how" and "where" the book would be read.

To sum up, we can state that experience design may apply when product design pays special attention to the conditions surrounding how the publishing product will be bought and read. The publishing house must evaluate how it can invest in the total experience of the reader, by, for example, selecting the book's materials or creating a pleasant shopping environment. However, we must note that this experience is pre-established by the content, seeing as the aesthetic perception of the text or the enjoyment that the plot provides are always the most important factors and are very often treated as the central aspects of the experience. Therefore, although these factors are determined by the author, and not the company, they play a role in the design, and must be taken into account during product development.

Cultural Design

The term *cultural design* was introduced into the academic arena by Francesco Mauri, Professor at the Polytechnic University of Milan. He used the term to define the manner in which design interacts with the culture[7] of a certain place. The concept of cultural design arose out of architectural studies and was initially associated with the idea that any city can be interpreted as a culturally complex organism that produces and consumes culture to ensure its survival (L. Brenna, 2002: 5).

According to cultural design scholars, this provides a way of thinking about and approaching a city as a cultural system.

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[7] According to *Real Academia* Dictionary, culture is "the set of behaviours, customs, knowledge and the degree of artistic, scientific and industrial development, of an époque or social group. UNESCO (1982) defines culture as "the set of the distinguishing spiritual and material characteristics that characterizes a society or a social group. It includes, in addition to the arts and the letters, lifestyle, fundamental human rights, value systems, traditions and beliefs". And the British Encyclopaedia describes it as: "the integral reason for human knowledge, beliefs, customs, taboos, codes, institutions, tools, techniques, art works, rituals, related ceremonies and other components. Cultural development depends on the human capacity to acquire and transmit knowledge in successive generations" (Luigi Brenna, 2002).

Design is: project (vision); culture (the source of the project's content); interpretation and communication (which makes the thought visible); an interdisciplinary project (which creates synergies between different cultural agents); creativity (which innovates and fosters attraction); and strategy (which brings coherence to the project) (L. Brenna, 2003: 1). Thus, cultural design may be defined as an instrument for cultural progress, whose objective is to improve the quality of life for the individuals thereof. In order to do so, it is founded on the culture of such individuals, and uses culture itself as the source of innovation. Another concern of cultural design is the improvement of natural resources and the appropriate application of technology in different social contexts. Other definitions surrounding the concept of cultural design are: design for democracy, user-centered design, and social design (CCD, 2004).

We may add that cultural design is design that draws on the culture of the context in which it is developed, with the ultimate goal of improving it. From a publishing perspective, under which publishing was always considered a process that generates culture, we may argue that cultural design is an activity that supports this mission.

> "The publishing business has had, from its origin, a deep involvement with the cultural world, an identification that continues to exist. But in recent years publishers have increasingly seen the complexity and importance of the tasks associated with aspects of economics and business management. Although this duality of the role of the publisher, as both businessman and cultural agent, may sometimes lead to situations of conflict, it is in fact the responsibility of each publisher to obtain the balance between cultural promotion and lucrative business " (P. Hoyuela Sánchez, 1997: 9).

Cultural design allows for the preservation of balance proposed by P. Hoyuela Sánchez; new product design is a commercial activity with profit objectives, while its cultural character provides the necessary concern to continue working towards human progress. Cultural design in publishing means that in launching a new book series, the cultural context in which it will be introduced must be considered, and the decisions made must manifest the intent to improve it.

Cultural-Publishing Product Design

In this section we'll examine several key ideas introduced throughout the text. These ideas will help to clarify the concept of cultural product design in general, and in publishing products particularly. To begin, recall that we defined cultural products as those goods that derive from a creative act. Under this approach, design may be understood as an activity that develops through paying special attention to the creative and intellectual character of the product being commercialized. Other factors that ought to be considered are the authors' objectives, as well as the role the organization decides to play regarding the authors and their creations. Amidst all this, from a cultural studies perspective, *cultural product design may be defined as the process of adjusting artistic and/or intellectual works for their presentation to the public and their market circulation.*

Similarly, we defined products as the sets of benefits obtained by the public through their consumption. However, in its own discipline, design is considered as a project-oriented process in which technical elements are used in the creation of material forms, which are then susceptible to being managed and/or visualized. We may therefore affirm that in the case of cultural products, design consists of pre-conceiving the set of tangible and intangible benefits that the reader or an exhibit visitor will receive through reading a book or attending an exhibit, and creating ways to project these onto the material forms accordingly. In general, cultural product design must be carried out by considering what, when, where, and how the product will be offered, as well as how it will be consumed.

We'll now turn our attention to publishing products, seeing as we are addressing cultural products and their design adapts the concept described above. Another way of approaching cultural product design, or the benefits developed in a publishing house, would be to focus on the combination of the different specialties analyzed: publishing graphic design, service design, experience design and cultural design. These specialties are associated with the responses to one or many of the basic questions presented in the previous paragraph. More specifically, experience design responds to the questions of what, when, and where. Service design is concerned with how the product will be offered and consumed, and graphic

design allows for the determination of the product as an object and as a means of communication.

This order manifests the similarities between the specialties, and highlights their interdisciplinary nature. If we try to think outside the limits of the current conception of design specialties, we may ask: Who designs a new cultural product? Ardill and Hollins, as well as it is generally accepted in design discipline, argue that an interdisciplinary team is responsible for product development. This team in the case of publishing products, depending on the size of the company and the demands of the project, is made up of editors, authors, graphic designers, sales managers, and marketing and communications specialists. On the other hand, in a small publishing house, this responsibility would fall solely on the editor and the graphic designer.

We can now highlight several of the characteristics of publishing products design:

1. Creation of dual nature products: tangible and intangible. Publishing products may be considered tangible if we consider the mediums used (object, book, or CD-Rom), and intangible, if we consider the benefits perceived through reading (experience, knowledge, enjoyment).
2. Creativity and innovation:[8] it is a process based on both logical approaches and intuition. Its objective is to create a product that did not exist before.
3. Complexity: it demands experience and knowledge in different disciplines and areas. It involves making decisions on, and by way of, various parameters.
4. Analysis: Throughout the design process, a solid vision of the product as a whole, as well as each of its components, must be maintained continuously.
5. Organization: it coordinates the mediums and the persons fit to achieve the best possible result.
6. Systemic approach: it follows and adapts to a system.
7. Interdisciplinarity: it involves many different specialties.
8. Problem-solving: such as a previously un-addressed need or the malfunction of an existing product. The grounding principle of new product design is that of the detection of a problem in the market.
9. Decision-making, on all levels of publishing.
10. Culture generation: due to the cultural character of the products, but also because the process itself generates knowledge (because one learns by doing, and because many different professionals work collaboratively).
11. New experiences generation. Design directs the experience acquired through reading. It also modifies the experience that the reader will have with respect to the publishing house and the bookstore.
12. Services improvement: it allows for thinking about what is offered globally. It contemplates the product beyond the possession of an object and the private experience of reading.
13. Visibility of the publishing house culture: it gives it physical shape (visual identity) and symbolic shape (brand value), which the publishing house hopes to project onto the public.

Enumerating these characteristics signifies an approach towards the publishing process, focused on a design perspective. The application of scientific-technical knowledge of design, and a designer's way of thinking, help publishing specialists conceive of the project more openly, and in ways that transcend the traditional vision of an object with a communicative mission, adopted in this case by Mazzalomo. Design must not be seen as a simple means of communication, but rather as a process that generates experiences that have been pre-configured by the editor and the team. In general, establishing similarities between the process of publishing and design leads to reflection and promotes the improvement of publishing practices.

Conclusion

The concept of cultural product design emerges as a combination of the following, currently recognized design specialties: product design, graphic design, service design, experience design and cultural design. From this combination we may arrive at the following conclusions:

1. Cultural products have tangible, intangible, service-related, and experiential dimensions.
2. They depend on the cultural context in which they are developed, and at the same time, they generate culture.

[8] This enumeration of design characteristics is in line with what B. Borja de Mozota (2003: 5) describes.

3. They are sets of benefits that may be perceived by the public through the creation of the appropriate material forms. Thus they encompass various forms that go beyond the product itself, and that modify the consumer's perception. In the case of books, this might be a bookstore interior; in the case of art, the museum structure.
4. Throughout the entire process of cultural product design, the public perception must be taken into account. In short, it is necessary to approach the acquired experience, value, and utility that the consumption of the cultural product addresses.
5. Product design, in this case, may be defined as a total process: it begins in the preliminary research phases, in which the market is explored, and a need detected, and continues into the phases of production, valuation, and possible redesign.
6. Cultural product design ought to be viewed as an interdisciplinary process, carried out by different professionals, depending on the demands of the project and the structure of the organization.

Design is conceived as an interdisciplinary process, and if we agree that a product is a composite of benefits, as marketing suggests, we can then argue that in the case of cultural products, design consists of conceptualizing and projecting onto material "forms" the composite of benefits that a reader perceives through the acts of reading or viewing an art exhibit. Here, we adopt a notion whereby design is a process of projection that employs technical elements in the creation of material forms that may be handled and/or viewed. These forms may be written documents, images or objects through which ideas, intentions, values, or messages are projected. We understand design, then, as a process of tangible or intangible product prefiguration, and as a means for activating the perception of a composite of benefits. It is, in other words, a channel that carries an acquired cultural experience. The design of a cultural product, then, must be carried out in a manner that carefully considers when, where, and how it will be offered to the public, as well as the specific circumstances of its consumption.

In closing, I'd like to offer some suggestions on potential uses of this research, clarify its primary purpose, and elucidate its objectives and inferences. Firstly, for designers, the objective of the study is to provide an example of thinking about design outside of the well-known design specialties of the day (graphic design, industrial design, and environmental design). The very proposal of the concept of cultural product design suggests the emergence of a new conceptual framework of design.

A secondary objective of the study was to prove that scientific-technical knowledge of design could be applied in other disciplines, such as publishing, with the aim of determining if their practices could be improved upon. An interdisciplinary investigative approach that combines and underlines innovative scientific specialties, among them, cultural industries studies, cultural marketing and deferent modern design specialties, was adopted. This research reflects the quest for improvement in the cultural sector and the need for a new reflection and action space. I hope that the text contributes satisfactorily to the development of these ideas.

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ORDER, DISORDER, COMPLEXITY

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Abstract

Although the relationship between design and complexity has been explored for decades, the theories of complexity have only recently started to influence the debate in the professional community. Without entering a detailed history of the development of complex thinking, this paper will present an overview of some elements of this scientific milieu.

By clarifying the notion of complexity, it is proposed that it can open promising horizons for designers and educators in design: using holistic visions may turn into a broader sense of reality, meaning rapid ability to adapt to changes, to be part of change itself, to take uncertainty as a chance (not only as a risk or a limit), to develop skills of organization, disorganization and re-organization.

While key concepts central to handling complexity are already familiar to design culture, it will also be argued that the task for designers is not to define or control complexity, but competent navigation through it.

Introduction

Consciously or not, complexity has already become our collective experience.Confused with complicated and often too abstract to be clearly perceived, we often sense complexity as change and uncertainty. *"But we are all actors of complexity, and as part of the problem we are also responsible for inventing solutions"* (Boutin and Davies 1997:114).

Into the core of complexity

The core of the word complexity comes from the latin *complexus*, "entwined", "twisted together", and "embrace" as well, derived from *complecti*, from the late latin verb *plectere*, to wowen. Then: *complexus*, that which is wowen together.

Complexity has turned out to be very difficult to define. It has been observed (Heylighen 1996a) that many definitions fall short in one respect or another, *"classifying something as complex which we intuitively would see as simple, or denying an obviously complex phenomenon the label of complexity"*. These definitions may result either only applicable to a very restricted domain, such as computer algorithms or genomes, or so vague as to be almost meaningless.

However, there is a common objective core in the different concepts of complexity and this may be interpreted in the following way: in order to have a complex you need two or more components, which are joined in such a way that it is difficult to separate them. It is from this entwined embrace that any further semantic extension of complex is derived. Similarly, the Oxford Dictionary defines something as complex if it is *"made of (usually several) closely connected parts"*. Here we find the basic duality between parts which are at the same time distinct and connected. A system would then be more complex if more parts could be distinguished, and if more connections between them existed (Heylighen 1996a).

Since the components of a complex can not be separated without destroying it, the method of analysis or decomposition into independent modules cannot be used to develop or simplify such models. This implies that complex entities will be difficult to model, that eventual models will be difficult to use for prediction or control, and that problems will be difficult to solve. This accounts for the connotation of difficult, which the word complex has gained in later periods. Further

semantic extensions refer to ignorance, size, variety, minimum description size.

The aspects of distinction and connection determine the dimensions characterizing complexity. Distinction corresponds to variety and to the fact that different parts of the complex behave differently. Connection corresponds to constraint and to the fact that different parts are not independent, but that the knowledge of one part allows the determination of behaviours of the other parts. "*Distinction leads in the limit to disorder, chaos or entropy, like in a gas, where the position of any gas molecule is completely independent of the position of the other molecules. Connection leads to order or negentropy, like in a perfect crystal, where the position of a molecule is completely determined by the positions of the neighbouring molecules to which it is bound*" (Heylighen 1996a). Complexity can only exist if both aspects are present: neither perfect disorder, nor perfect order are complex. It thus can be said to be situated in between order and disorder, or, using a well known expression, "on the edge of chaos" (Prigogine and Stengers 1979; Waldrop 1992; Kaufmann 1993).

Complexity as history

An history of complex thought brings back to the tradition of the epistemological and scientific thought and to its development along the nineteenth century (Bocchi e Ceruti 1985:8), when complexity has been progressively growing from the studies in cognitive and evolutionary sciences and system thinking. Systems theory was proposed in the 1940's by the biologist Ludwig von 8ertalanffy who emphasized that real systems are open to, and interact with, their environments, and that they can acquire qualitatively new properties through emergence, resulting in continual evolution. System-environment boundary, input, output, process, state, hierarchy, goal-directedness, and information, are among system theory key concepts.

Immediately after the second world war, cybernetics was the first real transdisciplinary scientific experience, gathering mathematicians, neurophisiologists, economists, anthopologists. In those years the first version of Warren Weaver's (1948) *Science and complexity appeared.*

Cybernetics and systems theory constitute an academic domain that virtually touches all traditional disciplines, from mathematics, technology and biology to philosophy and social sciences. System theory or systems science argues that however complex or diverse the world that we experience, we will find different types of organization in it, and such organization can be described by principles which are independent from the specific domain we may be considering. Hence, if we would uncover those general laws, we would be able to analyse and solve problems in any domain, pertaining to any type of system.

Complexity as multidimensionl knowledge

The present developments of system thinking move around some crucial points of evolutionary sciences, oriented at outlining a unified science of the living and the artificial. Complexity can not be experienced if acting within the conventional disciplinary boundaries. In the last decades, contributes of different nature, either from investigation in epistemology, philosophy and history - focusing at the generation, construction and circulation of ideas and research paradigms - gave shape to emergent contexts where unforeseable relations and interactions are possible among scientists belonging to different disciplines, between scientists and philosophers. Complexity can be perceived right at this crossing (where technological, scientific, epistemological, philosophical and anthropological questions intersect), thus enlightening the multidimensional nature of contemporary knowledge.

Ervin Laszlo (1985:362-400) argued that the analysis of the current new order and structure of reality needs the elaboration of a "science of change" capable to get over the separation between natural sciences and social sciences, outlining the profile of a scientist whose task is to select results from heterogeneous disciplinary fields, so to reveal analogies and isomorphisms, activating a transdisciplinary circulation of concepts within societies asked to act as resilient systems: that is, capable to react to a wider range of turbulence, progressively adapting to new forms of stability.

The developments of system thinking have been sided by a new meaning for the concept of evolution, now conceived as "general evolution" or "general theory of evolution", describing changes in the living world and in societies, allowing unified models of evolution to be applied to biological, ecological, social and human systems (Laszlo 1986:13).

The discovery of complexity

Isabelle Stengers (1985:61) has observed that the notion of complexity *belongs to a discourse around science* and does not refer to any specialised discipline or specific technique. The "discovery of complexity" indicates something that is radically diverse from any discovery to be encountered in the history of science, where a discovery is meant as the transition from the unknown to knowledge, an answer following questions: here, discovery stands for the awakening of a problem, or a form of awareness related to it.

Complexity as a discourse implies that radically new forms of (scientific) questions and answers are generated by a context where technological, epistemological, philosophical and antropological problems are entwined. In this context:

(i) knowledge and thinking become multidimensional (Bocchi e Ceruti 1985:10), absorbing different disciplinary categories of knowledge as multifaceted aspects of a unique reality,
(ii) knowledge and thinking are constantly facing uncertainty,
(iii) a science of change emerges as the alliance of natural sciences and social sciences, (iv) a need for strategy emerges (Morin 1985:59), as the skill to face and handle uncertainty.

Concept maps for navigation: system, environment, network, emergence

It has been claimed that "*the demanding challenge for designers and managers of design is to understand the consistent drivers of complex, dynamic realities. Operating in these realities is based on the understanding that complexity can not be controlled, but requires competent navigation*" (McGrory 1997).

The tradition of complex thought may provide a significant number of key concepts that can lead to draw a conceptual map so to possibly connect design actions to the navigation of complexity: see, for instance, the notions of system, environment, network, emergence .

In this conceptual map, a system could be delineated as that part of the universe which is distinguished from the rest by an imaginary boundary. One of the basic concept in the systems approach is that all systems interact with their environment. How can we then identify what a system is for design activity? Aren't we always making an artificial boundary? In order to perceive or know anything, we always make distinctions. The key idea of system is that once a system is identified and its boundary described, then one may describe the properties of the system, the properties of the universe excluding the system which affect the system, and the interactions between them. Thus it is a task of the describer to identify the way in which the system is interdependent with the environment.

The environment - in complex thought - is whatever is not included in the definition of the system. In developing a systems perspective a system is described in relationship to its environment, and how changes in the environment affect the system. The response of a system is how it changes when the environment changes in a particular way. Completely describing the state of the environment is, in principle, a much more difficult task than describing the state of the system. However, it is generally possible to restrict the aspects of the environment that are described to those forces which are most directly relevant to the system.

A network is a description of the connections that allow interactions and influences between parts of a complex system. It is also used to refer to the parts along with the connections, i.e. the system as a whole, when considering the effects of these connections. There are several types of networks: transportation networks, communication networks, utility networks, supply networks, but also networks of molecular reactions, networks of cells, networks of computers and social networks. And also the tangible or invisible networks caused by the relations that any design activity may start.

All networks can be thought of as influence networks: the state of the parts that are connected by the network affect each other through the network. Many of the most commonly studied networks assume that they are connecting essentially similar parts, with connections that are in some sense similar. However, more generally, real networks connect dissimilar parts in dissimilar ways. As part of the study of complex systems, the general understanding that we gain of how networks behave can be transferred between various kinds of systems, whether they are physical or immaterial, social or engineered, biological or man made.

Emergence is what parts of a system do together that they would not do by themselves: collective behaviour, and also what a system does by virtue of its relationship to its environment that it would not do by itself: e.g. its function; and further, the act or process of becoming an emergent system. More generally, it refers to how behaviour at a larger scale of the system arises from the detailed structure, behaviour and relationships on a finer scale. In the extreme, it is about how macroscopic behaviour arises from microscopic behaviour. To see in both these views we have to be able to see details, but also ignore details. The trick is to know which of the many details we see in parts are important to know when we see the whole.

By definition an observer may consider either the parts or the whole. Those who consider the parts consider the details to be essential and do not see the patterns that arise when considering parts in the context of the whole. Those who consider the whole do not see the parts. When one can shift back and forth between seeing the parts and the whole, one also sees which aspects of the parts are relevant to the description of the whole. Understanding this relationship in general is the study of emergence. Emergence refers to all the properties that we assign to a system that are really properties of the relationship between a system and its environment.

Jonas (1999) started arguing that systems thinking, especially sociological systems theory, provides some useful tools to describe design as a highly complex multilevel system. He has proposed identifiable levels of the social communicative system/ process: individual, team, organization, social subsystem/ disciplinary system, and society as a whole; levels of reality (Jonas 1998): events/objects, patterns of behaviour, structures and visions; and levels of observation, necessary for dealing with the blind spots of the lower levels: the meta-level of epistemology and the manner how theories and methods evolve in time (*strong theories*); the level of operative theory/ small theories (*weak theories*)/methods; and the operative level of making.

By introducing the hypothesis to conceptualize design in a wider sense as a social subsystem of this kind, Jonas (1994) has also introduced design as the network of future-shaping disciplines (i.e. futures studies of design acting as sensor; management of meaning in design as cultural industry or strategic design; product design for material or immaterial objects; service design to design invisible structures and stimulating behaviours). Here the meta-theoretical difference *system/environment* is introduced into the system as leading differentiator. Potentially, design-problems could be treated as system/environment fits throughout and the concept of organized complexity could provide the essential tools for either *systemic modeling and projective thinking*.

Complexity and the designer's paradox

What we may indicate as *the designer's paradox* directly pertains to the role of the designer and the related scale and limits of intervention in a complex world. Here we suggest that the thought of complexity may cross the designers's action at least at two essential levels, that we may label as "designing within complexity" and "designing complexity", as in Le Moigne (1985:84-102).

Designing within complexity may be intended as an act of awareness. Designing complexity may be seen as the transition through which the discovery and challenge of complexity turn into methods to handle complexity (Morin 1977:386). Both levels are part of the action of design, broadly intended as one of those making disciplines that have an impact on the physical world, address human needs and generate the built environment (Friedman 1999).

Although the exploration of the relation between design and complexity is not new, complexity theory has really started to influence the debate within professional communities only recently (Boutin and Davies 1997). By accepting and clarifying some elements of complexity theory, efforts have been directed to demonstrate how the notion of complexity can generate tools for design. As a recurrent starting point, it has been recognized (Boutin and Davis 1997:115) that the problem is not that of understanding complexity, but to define and create flexible methologies allowing practical application for design of new emerging concepts, to transform the discovery of complexity into a method to handle complexity.

Further, keys concepts central to handling complexity may gain clarity when going with a cultural maturity that entails the designer responsibility (1997:116) and are revealed as familiar to designers: as it is for the complex thought

integrating uncertainty while planning organization, linking, contextualizing, globalizing, recognizing both singular and general dimensions.

Using holistic visions may generate a broader (and entwined) sense of reality, meaning rapid ability to adapt to changes, to be part of change itself, to take uncertainty as a chance (not only a risk or a limit), to develop prompt skills of organization, dis-organization and re-organization, inventing dynamic concepts, strategies and actions.

Complexity, it is said, is in the eye of the observer. System theory teaches us that an observer is a person who makes measurements (observations) on a system to gain information about it. This information can be communicated to other people in the form of a description. The field of complex systems is interested in relationships. The observer and system are in a relationship. Thus a precise notion of an observer and the basic act of observation or measurement is a key concept in this context. As a more general definition (Bar-yam 1997) we could take that an observer is a system which, through interactions, retains a representation of another system (the observed system) within it.

The conventional view of an observer is of an objective observer and an objective observer is independent of both the system being observed and the rest of the environment. Implicitly there is an influence between the system and the observer. Thus, the act of observation must cause an influence of the observed system on the observer. The designer as observer is then expected to consciously manage the ability to apply holistic visions, attempting to create a balance between interdependent elements, disciplines, requirements, possibly sharing this ability with any professional seeking to participate in the design of future realities (Boutin and Davis 1997:117).

Designing within complexity

As we see it, the designer is mainly faced with cognitive difficulties. A crucial aspect of learning often regards *cognition*, that here is intended as the process by which decision makers form and modify representations in order to make some sense of a reality which is generally too complex and uncertain to be fully understood (Dosi et al. 1996:10).

The systematic gap between the agents cognitive abilities and "reality" can take at least two often interrelated forms: a *knowledge gap*, involving incomplete or wrong representations of the environment and a *problem-solving* gap between the complexity of the tasks faced by agents and their capabilities on accomplishing them.

In general terms, *knowledge gaps* arise from the lack of isomorphism between the environment and the agent's model of it. This is what may be called *substantive uncertainty* (Dosi and Egidi 1991). One may further distinguish between *weak* uncertainty (i.e. probabilisable risk) and *strong* uncertainty, involving genuine ignorance and intrinsic inadequacy of the mental models of the agents to fully capture the structure of the environment. Conversely, *problem-solving gaps* entail different degrees of *procedural uncertainty*, with or without substantive uncertainty.

Here we argue that the designer is still part of an operative dimension where both a *substantive uncertainty* (Dosi e Egidi 1991) and a *procedural uncertainty* are present. Consequently it may be recognized that the emergent horizon of actions performed by the designer will be dependent both on the ability for improved understanding of a complex reality and improved skills to face that reality.

Jonas (1999) has started to describe a design theory as a dynamic network of "chunks of ideas", with *self-similarity of design models* on the different levels of the process: not only design problems consist of largely contingent, purpose-oriented networks of variables, but a design meta-theory is a largely contingent network of theoretical elements, ideologies, preferences. *"Complexity on the problem side (how to describe the situation) corresponds to contingency on the solution side (how to change the situation into a preferred one). Organized complexity means the end of linear causal chains and creates feedback mechanisms. Design as a complexity-reducing medium of constructing the world is exploring the space of possible alternative futures."* (Jonas 1999).

Conclusion

The scales of intervention the designer may face range from the level of *evolving artifacts* to that of *large technological systems*, where the systemic dimension is explicit. It has

been argued (Friedman 1999) that acting within complexity involve either substantive challenges to design (increasingly ambiguous boundaries between artifact, structure, and process; increasingly large-scale social, economic, and industrial frames; an increasingly complex environment of needs, requirements, and constraints; information content that often exceeds the value of physical substance) and contextual challenges (a complex environment in which many projects or products cross the boundaries of several organizations, stakeholder, producer, and user groups; projects or products that must meet the expectations of many organizations, stakeholders, producers, and users; demands at every level of production, distribution, reception, and control).

These challenges require a qualitatively different approach to professional practice: as in Friedman (1999), what is required is analytic and synthetic planning skills that can't be attained through practice alone, advanced knowledge that is not a higher level of professional practice but a qualitatively different form of professional practice. If complex systems operate at the edge of chaos, designing at this edge requires coherent adaptive skills.

But, can complexity be designed? Or is it simply not designable? It has been argued (Le Moigne 1985:84) that a complexity that may be designed (or represented, invented, understood) is something complicated (or overcomplicated), not complex.

Let's go back to the designer's paradox, as in Morin (1977:179). When facing the phenomenology of design, even in the simplest evidence, one can not ignore any longer that any design action has to be connected to a framework of events, which in turn generate multiple maps of actions.

It is such a tension between design as the thought aimed at reducing the complexity of reality into forms of order (while questioning the nature and substance of reality so to progressively increase the understanding of its inherent complexity), and design as the action producing further levels of complexity, that here is re-proposed as the energy fuelling a deep, desirable transformation in the design approach.

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DRAWING AND IMAGES DF DESIGN. REPRESENTATIDN AND MEANING.

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Abstract

This abstract is based on the research being conducted on the relationship between design and drawing, whose results have been presented at various congresses.

The aim of the research is to clarify the intervention of drawing in design, by differentiating between "object" and "image" and between the "symbolic character" and the "form of representation" by demonstrating that the efficiency of the project is based on conflict generated by the act of drawing in itself.

Based on the triangular classification of design as author-programme- technology and drawing as representation-classification- imagination, it can be argued that: the object's identity arises from the confrontation between representation and the image, thus questioning its unity. In other words the way of representing the object through a technical mediation referring to an abstract concept (the act of drawing), of symbolic function, and of attributing meaning to the symbol, insofar as it refers to object.

This paper intends to approach drawing as the language that makes the appearance of the images of design possible. The images of design function as double:

- object of representation whilst represented image (physical representation);
- object of desire whilst promoter of a story of subjective experiences and emotional relationships. Examples will be given. We consider the specificity of drawing through two possibilities;
- representation as the action of drawing in the object's presence;
- representation as the action of drawing in the object's absence.

Drawing as a instrument of the project participates in the duality of the images: as representation of the idea (concept) and as action that provokes the emergence of the object before an interested and desiring subject.

However, under these conditions, drawing exists as an action that does not dilute itself in the representation, since object

and image, as differentiated and implied entities, relate to each other. Drawing is the place where the object's necessary differentiation and uncertainty manifest themselves.

Keywords: representation, image, symbolic, object, desire.

1. History: A modern condition

Drawing as a instrument of the project represents the idea (concept), summons the emergence of the object in the presence of an interested and desiring individual. Its condition of *technical doing* registers the act of drawing (the drawing) as a founding discipline, which is autonomous from the project.

In this condition drawing as an action that does not exhaust itself in the representation of the project, making the relation between the object and the image implicit. Drawing exists as the figuration of a «lie» that is art (the terrain where reality converges).

Modernism empowers art with the possibility to demonstrate the irregularities and the blunders of the system of art. The incoherencies and deadlocks become constituents of art par excellence. *Pulsion* as legacy of art guarantees its own legitimacy, which turns out to be a pulsional «tranquilizer». (figure 1)

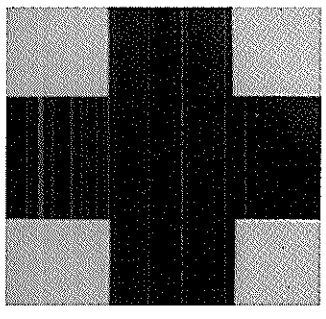


Figure 1. Malevitch, Black Cross. 1913

Design as the legitimate representative of modernity (worldly and factual) results in the paradox that its symbolic legitimate existence is connected with its own denial. The "symbolic" denial reveals that a crisis is necessary for its own survival. Design as a discipline arises from the protagonist of this modern paradox. To assert itself design needs to deny its own autonomy, subscribing to, or at least, approaching art or technology.

The continuity of the symbolic in design depends on contradiction of what is denied as acquisition, and in this case with art. The transcendence in design is unveiled in the heteronomy of its possibility to exist.

Contrary to art which is essentially solitary, design is sympathetic towards the instrumentation of fantasy as a guarantee of human legitimacy. The possibility of being-related-to another "newly-arrived" object is liberating and contradicts the breach of confidence in the human-being as a modern reference. (figure 2)

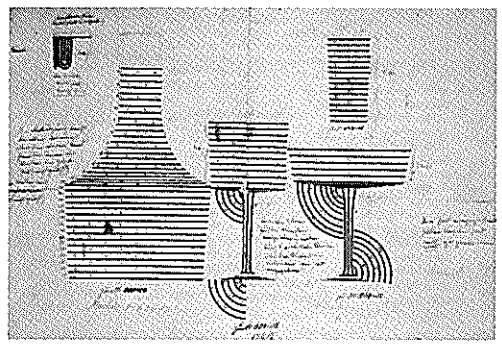


Figure 2. J. Hoffman, Bottle and glasses project, 1912

The *medium* –point, line, and blotch– that conveys form formally fixes the object by means of a technical or technological dependency; uses the bi or three-dimensional expression as an internal or external condition of the object, not technically or technologically instrumented.

The representation is ichnographically or formally fixed by means of the medium. On the other hand, the images as *media* are autonomous regarding the act of representing. Could this extreme case be regarded as image without representation? And in this case could it be said to be an uncommitment of art?

The modern (according to Baudalaire's *modernité*) is neither against the old nor the past, but against the classical as that which is transmitted by the processing order, in the continuity of the existence of the object, in the chain succession of cause and effect. When Baudalaire promoted modernity (*la modernité*) in 1849 he did it on behalf of *aesthetics*, thus break away from the continuous element that existed in order of the cognitive world. (Jauss, 2005:332)

The modernist proposal underlines the desire to break away from the neoclassical presence of the 19th century, which idealised the heroic, and giving way to the questioning of the classical images and of Darwin's and Foutrier's "scientific" culture.

Regarding the aesthetic, the fight against the ornament gives rise to the cult of the necessity to understand the truth and proposing its representation. Modernism aspires to understand reality and the possibility of its representation by substituting the reality which is symbolically interpreted for the symptomatically undecipherable reality. The phrase «less is more» symbolises, in a hysterical fashion, the Modern (imp)possibility. The denial of the symbolic reality as the possible place for the representation, and the possibility of interpretation, therefore, art starts to expressing itself by means of symptom and returning to the figure as the possible configuration of the object of art.

In the 19th century the proliferation of the taste by means of the superfluous expression that multiplies itself factually and historically by means of the cumulative diversity of the objects, establishes the presence of the object of art as the waste of the system of art - a place where existence is confined to uselessness (Figure 3).

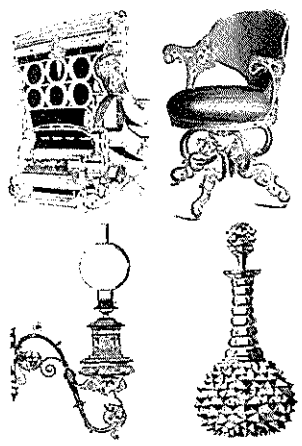


Figure 3. Great Exhibition, 1851

What is left of the historical perpetuation of the artistic as a projected "adjustment"; that is, the desire (taste) of the material structure of things is then autonomously referred to as the discipline of design.

An object produced industrially and its reproduce beauty, defined by structural existence of the object. In this case beauty pre-exists to the physical reality of the object, inscribing itself there and then in the proposed project by means of the drawing. An industrial object "of beauty" resorts to projection as the characterization of beauty. On the contrary, a hand-made object – similarly applying to art - inscribes beauty on its act of technical production/technical action. In this case the technical action exists committed to beauty, not being able to separate from it. In design beauty can pre-exist to the production of the object by means of the author, who as the operator of the drawing is able to "recover" the dimension of beauty[1] (Vitta, 1996:37).

The issue of reproducibility can arise from the reproduction of a model (in design) or from a similar pre-existence (artistic series). In the first case, beauty inscribed on project by means of the drawing reproduces a similar object. In the second case beauty surfaces by means of the technical act of doing/producing the object reveals what is not similar by the reproduction of the object.

The series like work methodology in art relate to the search for the "industrial" interpretation of the artistic object and paradox ally verify the dissimilarities these contain.

2. The nature of the problem

The **nature of the problem** in art and design differ. With regards to art it deals with a resolution which is strictly formal, present and related to the time of the work. The resolution of

[1] About the nature and inscription of beauty on the object of use and in its differentiation from the object of art mentioned by Vitta will always require defining which beauty (or ugliness) is being referred. If it's true that for art the reference to "beauty" or "ugliness" is an acceptable definition, for the object of design the most acceptable concept is " good taste" or "bad taste", which on its own is symptomatic of some determinism. Nonetheless, which "good" or "bad" taste will have to be specified. Whichever aesthetic "filtering" used on the object of design, it always refers to the authorship of the work by means of the author's instrumentation of drawing, and not the serial production of the work, whereas in an object of art the issue is directly implied in the production of the work.

the problem relates the action, fixes the work, and establishes itself as the worldly reference in the constructive process of the work. Whereas in design the problem precedes the action, it comes before the form, and its evocation derives from the programme and amply perpetuates itself in a game that outdoes the author of the form. On the contrary, art not considering the *problem* as something outside itself, suggests a "remake", strictly within the artistic field, obliging a "reproduction" of itself. Disregarding its exterior surroundings art cynically evokes its own self-destruction; hence promoting the "emptiness" of art that we have grown accustomed to.

In a positive way, design seems to occupy the "emptiness" of art by reflecting on its own condition by means of the *other*; that is, by means of the founding permissive of the utility of the object. The current manifestations of everyday objects (more reflexive and humanised) are probably those which are closer to the artistic as a means of existence of use, by means of the consideration of the project, as an inaccessible consideration of the *other*.

The object arises from the project and this one is responsible for the form in the strict relation with reality in which the object is born, grows and is utilised. The project "is not only responsible for the formal identity of the object but also for its way of being and the context it was born from and it should act in." (Vitta, 1996:15). As Christopher Alexander wrote:

> The final object of projection is the form.... each problem of projection arises from the effort to reach a correspondence between two identities: the form in question and its context. The form is the solution of the problems and the context defines the problem. In other words, when we talk about projection the essence of the discussion is not only the form but all that is related to the form and its context. (Vitta, 1996:14).

In this case, as Maurizio Vitta refers, "this statement confirms the primacy of the object but at the same time it defines its nature by means of its ways of existence guaranteed by its projection." Can't this be the question of design: by means of its form define the context of its appropriation? Does design then identify itself with the project? And the latter with all the understandings/presentations of the object? In this case the complex articulation network of the project will reveal itself to the presentation of the object of design as an uncertain form, revealing itself with the contradiction that is inherent to the act of existing. Can't this uncertainty, revealed by the project of design, constitute the motto for mobility of the discipline itself? In actual fact, the question of series that defines the object of design – at least what stipulated as its definition in the first days of its assertion as a discipline – is not only a repetitive and egalitarian series of a chain of production, but also a worldly series that allows design to be discipline of method and thought that considers the pre-existences and the alterations thereafter (Figure 4).

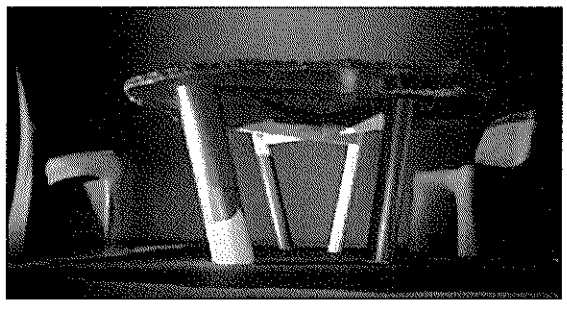


Figure 4. Gaetano Pesce, Table and chairs Cassina, 1978

It would be absurd to fix the objects as it would be to stop the world. In actual fact the more design "grows" as a discipline of project (of the object) the more vulnerable it becomes, which is subjected to the non-fulfilment of its structural coherence, when the designer is denied the possibility of technical and material control in the production of the object. In actual fact, the more the project grows the greater this possibility seems to become... and can this be once again a symptom of disciplinary growth? To conceive design as the presentation of the object as a stable and singular presence would fall into contradiction with the presence of the object itself, and in this case design is desired according to the object it represents. Even if it is based on an uncertain relation with itself, facilitated by a mirror and result of its «interdisciplinary».

The question of design is the nature of the project in its condition of representation by the concept of the figure in its nature of the word and image. The word exists implied in concept, in the content of the idea, whilst the image implies the precept of the imagination. Thus, the project derives from the concept and the percept articulated by means of the word and image.

Art as an historical event, breaking away from the symbolic, by denying the "evolutionary/explanatory unity" of history, nonetheless, "expressing itself" as an action (producing a piece of art) defies itself as the action in search of mankind's knowledge (philosophy). Regarding a possible transcendence, which is not at all religious, must refer to acquiring human knowledge. Humanised art "self-diminishes" as a practice giving rise to new doings - new activities. Among which, the possible and desired, design?

3. Representation and meaning: Configuration and presence

The representation which enhances the defocused on the object of use, while the representation which enhances the process (the procedural action) places the work of art as an image of itself.

The representation of the idea as the symbolic representation of the wish/desire, via the senses, uses the image as a symbol in the configuration of the object as an image that derives from the idea (object of use/object of design). On the contrary, the representation that focuses on the process as a contradictory and symptomatic uses *simulacrum* to acquire a proximity of meaning of object of art as identification of the unobtainable reality (Figure 5).

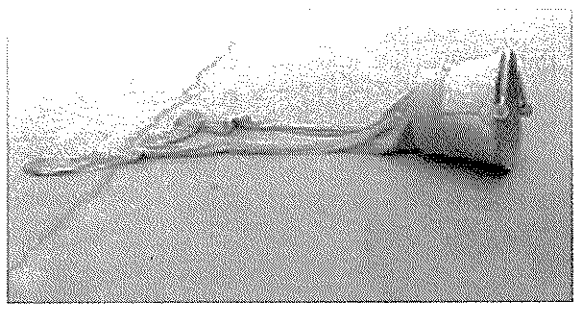


Figure 5. Sarah Lucas, The sperm

The representation that derives from the image that becomes of the object of art recognises the procedural action the real mediation as factor of contradiction and paradox. Contrary, a representation that derives for the metaphorical idea that organise the concept, as a symbolic representation of the senses, and recognises the subject as a mediation of the object of use.
The modernism institutes design as visual discipline via the representation that symbolises the desire in the configuration the object. In its industrial beginning the designer was called upon to "formalise" the symbolic character of the universal object, whose understanding was merchandise. The drawing transformed the object-merchandise in a private object. In this case, the drawing of the object is tangible, rational and deductive by being a programmable project. Nowadays, the designer elevates the object in such way that from it derives the possibility of a symbolic discovery, and in this particular case the private object is returned to a universal context on account of its possibility to discovery of the private. Drawing itself also starts to refer to the sensitive, the unpredictable and chance.

Arts only possibility is the contradictory representation. Art as a double - image and *simulacrum* - is the identity that comes closer to reality, but its inability to represent reality it is a mere lie. As a lie art *identifies with*... as Álvaro Lapa refers quoting Nietzsche proverb, "we have art not to die or go mad when faced with the truth; therefore we don't have the truth, we have art to stop us from going mad or dying of terror before the truth" (Lapa, 2006:158).

In this context the images of Art Brut while fantasy reconstructions of reality incarnate a fundamental fantasy that cannot be interpreted but only reconstructed, which is defined by Lacan as the "acefalus" knowledge, delirium, hysteria, or yet a body without organs, or at least without functioning organs, and therefore, a body that is not an organism as Gilles Deleuze defines it- and in this case the work of art is constituted of an apparition, dream, a shadow, images without sensorial mediation, only a greatness of the senses (Figure 6).

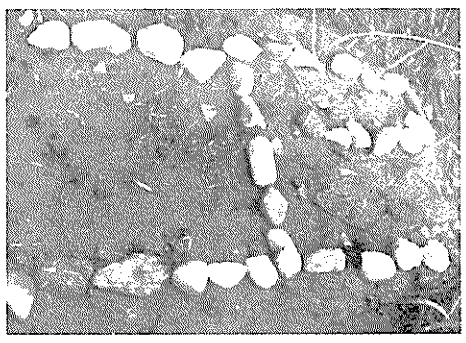


Figure 6. August Walla, Without title, 1970

Apparently, the art institutionally produced for contemporary museums also lack sensorial mediation. On the contrary the images of *Art Brut* are depurations of the senses, images that serve as exemplary. The appeal to the senses is cerebral resulting from the inversion of the artistic process considered up to now as *natural* - the direction being from the senses to the brain via the desire. The representation considered the desire in its closeness to the senses and the object resulting from the figuration of the image. Whereas the representation as an expression of the cerebral will recreate images that apparently present themselves as objects. As figurations of the presence of art in the work of *Art Brut* survive without context, contrary to many contemporary work of art that out of context run the risk of not existing as work of art.

4. Image and object: Symbolic condition of design and *simulacrum* (as symptom) of art

The images of design have a dual function: object of representation, when it is a represented image (physical representation) and as object of desire, when promoting a story of subjective experiences and emotional relations whose organisation is symbolic.

When the meaning of the object is arises from a desire its presence is interpreted as functional, technical and subjective. Therefore, it is an object whose meaning is symbolic and in this capacity it represents. In this case the representation of the object of design is done *in the presence of...* which implies a latent proximity to the object, a chance of a sensory and physical perception, relating to a desirable, meddling and "interested" presence. A representation by means of a symbolic presence implied in the image that it figures. The possibility of the project in design to take shape of the object through drawing it is the guarantee of the project that allows design to be the object that formalizes the symbolic.

The act of drawing as a representation in the *proximity of...* manifests within the possibility of the project being the symbolic interpreter. The representation in the *absence of* ...not establishing itself as a precept of the action, hence not implying a condition referring to ...it will thus be a projection distant from the object, refers to it ideally as a construction of the mind that positions the object at a distance, «disconnected» physically and circumstantially of its symbolic condition. The object that is born from the *absence* of drawing conceals the symbolic from which it derives and to which it will necessarily have to return, otherwise, it runs the risk of losing itself. Fussli's assertion that "Religious people produce relics as art, warriors produce trophies and the bourgeois commercial articles", (Cerezo, in Calvera, 2003:26), it seems evident from the XIX century causing the drift away from the artistic concept. Thus, art recognises its need to assert its uselessness, reclaiming its disciplinary autonomy, wanting to escape the aesthetic function. Consequently, the aesthetic function rests on the ornament's side provided it derives from the symbolic function of the beauty of the object. The object of design will be "submissive" to the symbol concept that organizes beauty, while this one was rejected by art.

The recovery of the organizational order of beauty conceding it a political position in the organization of the world, it has always been the path taken by the objects in and out of art and the artistic realm. In the Renaissance the organization of the objects via a politics for drawing, put into action by the creation of Accademia dei Disegno di Firenze, with maximum functionality, whilst symbolic entities that organize the world, making of the drawing a discipline of representation of the world by means of the ornament. In this case the ornament is the place of the significant image that organizes and expresses the organization of the objects and the world. The theoretical substance that organized itself to confer power to that was designated as *Disegno* had as its interpreter the artist Giorgio Vasari, whose artistic expression was imminently decorative, guaranteeing at once the twofold possibility to ensure the conviction of a power that establishes itself interiorly, and thus reinforcing its efficiency and the presence of an image domain that will lead the objects to designate the symbolic, which the power needs.

Modern design in its quality of project is proposed as a functional sign, being against the symbolic ornament. In the 70/80 design in its quest to liberate itself from the function becomes symbol of itself. Can we consider design in the 21st century as a practice that aspires to be a sign of itself, not only as a projected action, but also as a discipline? In this aces design interprets the sign through the symbolic comprehension of the image that derives from the representation that aspires the figuration of the object.

The symbol as a sign that *acts*, and capable of a communicative exchange, is transformed into a symbolic efficiency. The symbol as a communicative inscription limits the efficiency of the action of the sign universe. That is, the symbol favours other symbols that are associated to it, while the sign is a fixed entity that generates an imitation. The images as symbolic representations appeal to the mobility of the symbol. Outside this mobility, they become sign imitations of the symbol fixing the image as a reality, expressed in what was the Modern artistic claim.

The symbolic evocation of design is/can be made through drawing. The Design that lacks drawing is a symbolically "diminished" design. Too see/perceive design through drawing is to admit in its practice:

- memory;
- disciplinary past (through *disegno*);
- aesthetic reference;
- style;
- value of the image.

Regarding the object of design's relation with the viewer/ consumer because of its resolution and presentation as a symbolic property it has the power to attract due to its capacity to provide "identification" from an economic and rational point of view, both being added-value for the emotion. The image as *power of signification*, as an identity that liberates us from the order of significant representation - a quality of art- is "inspired" by what we know does not belong to the order of representation. The act of drawing summoned by the representation of the object of design is inevitably implied in the state of existing for drawing and the latter for its gestalt dimension, brief, light, ignorant, potentially "out of control", reveals the absent that which symbolically shows itself in an unexpected manner as a new presence. (figure 7)

The issue regarding the symbol and its association with design besides posing the question of knowing whether the symbol comes before or after the form of design, it also poses the question of how the symbol interferes with the discipline of design. If the first question requires a methodological analysis, which owing to this work's theoretical restriction is not going to be approached, the second requires reflection.

Can the symbol thus be considered an ordination of the thought related to the manifestation of the unconscious? Or simply an ordination of the idea by means of a content? In both cases what is in question is the formal relation between form and symbol. As it so happens this relation is still connected with the project that is, an action that manifests itself in the desire of the event, refer to as desirably constructive action. Therefore, differentiated from art that does not configure the project but the way of acting - while pure expression of the action. In Pollock's work the *manner of action*, for example, the spilling of paint does not conform to a project. As the action starts to take shape the further away the projected character drifts, and the work becomes a formal expression of its anxiety to the extent of suicide being its dead end.

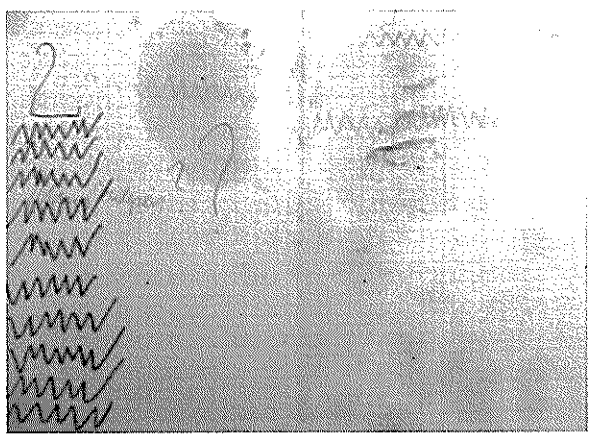


Figure 7. Joseph Beuys, 1978

A further example of projectual desertion in art with dramatic consequences was Rothko's work, which tread a path of return to non-existence. His work became formally "purified" to the extent of becoming chromatically equivalent to his earlier paintings. His work undergoes a process of a formal and chromatically simplified where his late chromatic path meets up with his initial chromatics. This meddling of reality with art does not occur with design. That is, the significance of the symptom, which is the condition for the existence of contemporary art, excludes the idea of project. Design as a discipline of the project can only accept the symbolic movement that provides meaning the object, which in this case is contrary to art.

5. The desire of design and the purpose of drawing

The object of design resulting from drawing is an object which relies on the creativity to become its own-object[3]. The object of design deals programmatically with innovation, but ultimately results from the author's creativity which is expressed by the material and technical operation of drawing. Drawing is implied in design as an essential instrument in the development and figuration of the functional relations implied in the project (the sketch) as a trustee of the perception and the figuration of the non-visible (Figure 8/9).

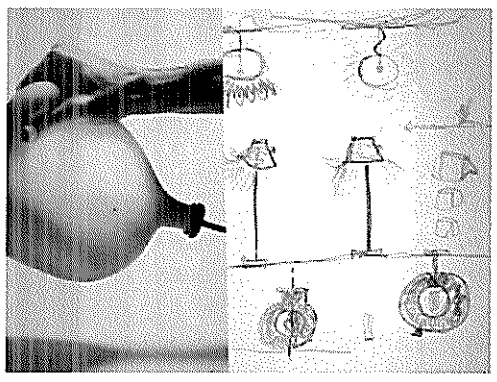


Figure 8. Héctor Serrano, Superpatata, 2000

The representation in its trilogy -symbolic-real-imaginary- refers to the symptom as the means by which the figure reveals itself: the ghost as an operation by means of the symbol; the imitation as the presence of the imaginary. In this case art breaks away from the artistic that derives from the representation of the concept according to the deductive model established by the object by means of the symbolic image. Art belongs to the spectrum of the symptom as long as it glows and carries visual intensity, deriving from an inductive model that results from the figuration of the art substance. Art is a place of rupture in the interpretation chain, it decrees the non-interpretable. Thus, art dissociates itself from the aesthetic function embracing the anthropological dimension. The anthropological understanding of art allows it to exist in the object which belongs to art, as if it were a "magic" event. Being of the art substance, the first instrumentation of drawing is "magic", as the manifestation off the purpose of origin.[4] The second is decorative and didactic whilst an expression of desire and the third is projectual manifestation of the possible transformation.

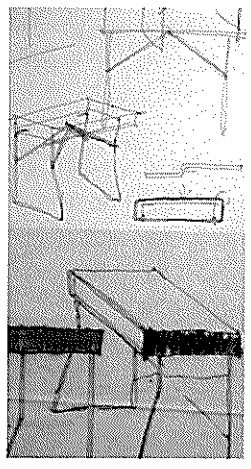


Figure 9. Blu Dot, Li'l Buddy, 2001

The drawn objects (of design) are like aesthetic formulations that priority was registered/classified as artistic interpretations. The discipline of design results from aesthetic function which before was considered to be of artistic terrain that promoted the appearance of artistic objects by means of its representation.

The prefix re of *re+presentatio* means intensification. Re + presentatio is presentatio (= image) + re (= idea). That is,

[3] Innovation and creativity are two different ways of understanding production/configuration of the objects. Innovation is grasped as the strategy of the productive process in its utilitarian role that gives rise to technological and organizational development. Innovation in its utilitarian role-the production of the object- aspires the idea of the recovery of a particular result by means of utilitarian and programmed rules. Creativity is an act of originality and it is revolutionary which is not programmed by the rule and thus it is not combinable. Acknowledged as not fulfilling the utilitarian role, not sacrificed to the rule but a proof of satisfaction, which favours the process and considering the result to be inscribed in the process

[4] Even before its consideration as register the "magic" dances in honour or as a offering to some pagan god can be considered as manifestations of the corporal drawing.

image + idea , image (= presenatio) is more than reality it is an augmentation of it by means of the idea of reality. Thus, it represents itself always by means of the absence in both the duality and division of desire. The symbolic drawing that operates and interprets the duality of desire realizes the concept of the symbolic image implied in the unity of the purpose allows the appearance /con-figuration of the idea (Nancy, 2002:63-70).

Can it thus be concluded that the purpose of drawing is achieved in the desire of the object? In this case, the unit of the symbol is present in the object of design by means of the drawing provided by the act of drawing. In this case the differentiation of the object of art is circumstantial inscribed in the symbolic presence in the case of design and symptomatically in the case of art; both referred in the presence of the object.

Thus, it can be concluded that the difference between drawing as the project of things of usage and drawing as an artistic project is as follows: the enunciation of the project of design is ethical, social and political, acquired through the concept of work, whereas the enunciation of the artistic project is philosophical, evoking the absence in its epistemological image of technique.

The *disegno* transforms into design by adding an ethic-political element to the philosophical dimension of *disegno* when it is a project. the project in design when deprived of ideology it becomes an exercise of style, which was proved by Modern rationalism as well as the «radical» consideration in the late 20th century (Vitta, 1996:126).

Drawing as a representation participates in the duplicity of the images as a instrument of the project arising from the idea (concept), and as the process (action) arising from the appearance of the object in the presence of an interested and desiring individual. However, in this case drawing exists as the action that does not drain itself in the representation because the object and the images relate to each other despite being differentiated and implicated entities. It's in the drawing that the object's necessary differentiation and uncertainty find the space to manifest themselves, where, if only provisionally, it is possible the differentiation between the identity and the meaning.

The purpose of drawing is fulfilled in the desire to draw; thus, making the appearance of the object possible by means of the symbolic (re)presentation more or less predetermined - in the case of design - or by means of the symptom in the (con)figuration that presides over the appearance of the object – in art.

In this case, the meaning of the object of design and of art is different. Submitted to a programme arising from the supposition of the technique, the object of design reveals its autonomy by means of the drawing, even if the desire is "imprisoned" in the act of drawing, in the production of the specific drawing in tune with the object. On the contrary, art does not take into account the object's peculiarity and the object as a supposition of the technique is only a means of access to art. In this case, the sequential condition in design is from the start structural, while in art it is subsequently sequential. In design this condition is the defined and programmed, thus having an optional quality, whereas in art sequence is inevitable in that the processing of the object is never-ending.

Drawing is not a fixed entity, neither by determination nor by construction. On the contrary it s fascination lies in its encounter with the constantly unequal and in mutation. It is only possible to fix an image/a drawing by means of the act of drawing, and not the drawing itself. In this case, what is fixed is a drawing in the passing of time of drawing.

The progression of drawing in time is made through mapping - a defocused perception (reading) - by means of progressive arrangements of images which imply other images as a shape and power of suggestion: the certainty of the appearance and the false and deceiving visihility.

The memory that reflects and that (re)produce drawing twofold: the memory of the past, of the pre-existences, and the one which projects the future. Yet the one that belongs to the project is a «false» memory, a projected memory, which is factually absent. During this memory period the drawings are produced from the object's absence. The drawing of the object arises from the contingency of what cannot be definitely fixed but only reflected by its register, in the *intervals of* ...what could be the essence of the object regarding its concept. The figuration that derives from the drawings is the

only stable condition for the object - confined to the choice of the moment, but nonetheless a possibility that is present.

It is no longer through the object that time is fixed by through its representation. In this case the power of representation overcomes reality. Drawing returns to the representation despite rejecting or overcoming the project. It represents itself despite nominating the world.

The purpose of drawing is fulfilled in the desire to draw which facilitates the appearance of the object by means of the symbolic (re)presentation more or less predetermined - in the case of design - or by means of the symptom in the (con)figuration that presides over the appearance of the object – in art.

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STRICTLY BALLROOM OR DANCING IN THE MOMENT?
METHODS FOR ENHANCING THE PARTNERSHIP OF DESIGN AND BUSINESS.

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Abstract

The relationship between design and business has been the subject of considerable research in the field of design management. The success of this relationship, in particular between business clients and design consultants, determines the effectiveness of design projects in meeting business objectives. It is in the design briefing process that these issues are brought most fully into focus. This seeks to formalise mutual and coherent understanding of the project in terms of a written agreement of objectives, drivers and requirements for sign-off. A study of the process, suggests that this can be problematic in several respects – most notably the reluctance of designers to raise questions concerning business, which reflects their lack of confidence in using business-related language. Whilst previous studies have proposed detailed guidelines on the issues that should be covered in design briefing, these can be too prescriptive and focus exclusively on the content of the brief rather than the process.

It is the contention of the authors that the briefing process provides a vital opportunity for sharing the tacit knowledge of both business and design, which is a key determinant of project success. The dynamic interaction of the client and designer during the briefing process, striving to achieve shared goals in the project context, is described by the authors as "dancing in the moment", and is contrasted to the "strictly ballroom" approach of conventional briefing guidelines.

Introduction

> "It may be possible to do without dancing entirely. Instances have been known of young people passing many, many months successively without being at any ball of any description, and no material injury accrue either to body or mind; but when a beginning is made -- when the felicities of rapid motion have once been, though slightly, felt -- it must be a very heavy set that does not ask for more."
>
> Emma, by Jane Austen

If we were to regard the association between a design consultancy and their client in terms of a human relationship that aspires perhaps to a marriage of business and creative interests, the first design brief forged between them is the equivalent of that crucial first date. Get it right, and the confetti of commercial success will soon rain down upon them. Get it wrong, and it's back to the singles' bar of the unpaid pitch.

We view the briefing process as a dance – a shared experience that seeks a dynamic movement that exceeds the sum of its parts, relying upon mutual trust and a willingness to learn quickly the strengths and distinctive styles of each partner. It should be an enjoyable experience that enables flexibility and – within agreed parameters – risk taking. But what sort of dance is appropriate? Much of the literature on briefing is of the 'strictly ballroom' school – a prescribed choreography within a very formal setting. The research upon which this paper is

based suggests the value of a more improvised approach. It is our contention that the briefing process provides a vital opportunity for sharing the tacit knowledge of both business and design, which is a key determinant of project success. The dynamic interaction of the client and designer during the briefing process, striving to achieve shared goals in the project context, is described by the authors as "dancing in the moment", and is contrasted to the "strictly ballroom" approach of conventional briefing guidelines.

Tomes and Armstrong (1997) have described briefing in terms of a process of "verbal-visual translation" whereby business objectives are expressed visually by designers in an iterative process that progressively moves the partners towards a point of agreement. Based on primary research conducted on the briefing process in a major UK-based design consultancy, we propose an approach that builds on this 'translation' perspective, providing a framework that seeks explicitly to share tacit knowledge through an approach that uses storytelling, visual exchanges and metaphor. This paper summarises the underlying research, sets out the case for this approach, and discusses its implications in terms of business and design education and professional development.

Two worlds

Despite efforts made by governments in the UK for a century and a half, there remains a stubborn and seemingly unbridgeable gap between design and business. The recent Cox Report highlighted the lack of awareness that too many enterprises have of the value of design (Cox, 2005). Designers are perhaps seen as the "felt-tip fairies" with their clients finding it hard to understand them and the potential value that they bring. Equally, designers, having no formal business training at University or art school, can find it difficult to communicate their ideas to their business-savvy clients, without years of experience. As Walker (19B9) has observed: "Managers are good at dissection, cutting through irrelevancies, getting to hard facts and the basic structure of problems. They are very problem oriented. Designers by contrast are good at assembling, bringing unlikely things together. They work by leaping to detailed end results. They are solution led." With different strengths, different ways of thinking and different ways of seeing the world, designers and businesspeople are often seen as two tribes, too often in conflict. During a design project, communication is key. But when client and designer come from such different backgrounds, both with differing perspectives, communication can be difficult and somewhat strained.

This gulf in communication can become most apparent and visible during the briefing process. The aim of the briefing process, simplified, is to define the parameters of the project, the scope, deadlines, limitations, resources etc. Studies in the literature do not, however, talk of a briefing process. They tend to talk of "the design brief" — that is, the finished product; the piece of paper for sign off. However what is important is the actual process in which designers and clients engage in order to arrive at a mutually agreeable brief for the project to commence.

To be successful, briefing should provide a focus for a whole process that precedes the finalisation of the "piece of paper". Olson, Slater, and Cooper, (2000) describe the three stages within briefing as follows:

1. Clearly articulate the firm's competitive strategy to designers and design managers.
2. Develop a detailed understanding of the design requirements inherent in the adopted competitive strategy.
3. Ensure open lines of communication among the design group and other functional units.

We propose that by client and designer actively engaging in a briefing process; by interacting to satisfy both client and designer goals, the barriers in communication as defined in the introduction, can be broken down.

This paper looks at the work of Tomes, Oates, and Armstrong (1997), and Nutt (1993), in setting the scene for the importance of increased communication during the briefing process, and in contrast, the rigid manner of Phillips (2004) in "creating the perfect design brief". The perspectives of Tomes, Oates and Armstrong (1997) will be examined in detail, in particular, their suggestion of the need for verbal and visual translation to enhance communication. In addition, the authors' fieldwork in the design industry, drawing on a case study of a leading UK-based design consultancy, will propose guidelines for briefing, as "dancing in the moment" as a comparison for the "strictly ballroom" approach, as advocated by Phillips (2004).

Briefing – the Peter Principles

Design briefing carries with it a whole series of contradictions and complexities. This section of the paper will now outline these perspectives.

Briefing: A Rigid, Structured Process

There are practitioners and authors who advocate a strict and highly formalised briefing process. For examples, the RIBA have devised a formal "Plan of work" which structures the process architects use to form a brief. This process is highly rigid and systematic, and does not allow for creative and spontaneous interaction. This may be appropriate for architectural briefing, however, its application is limited when faced with the design of an interior or a brand for example. It is therefore not a cross-disciplinary approach, which is the shape of design today – health, social sciences and design are collaborating more now than ever before, and if the briefing process were as rigid as the RIBA's plan of work, this would limit the creative interaction vital to the momentum of these projects. The RIBA's plan of work is indeed appropriate for large architectural design projects - after all, these must be rigidly planned and structured. Their vast body of work is highly commendable and relevant to the discipline of architecture, however, their linear models and principles cannot easily be applied to other design disciplines.

Peter Phillips (2004) is regarded as the leading authority on defining the briefing process and has become highly influential in business and design. He stresses the need for definite content of a design brief and, in his book "Creating the Perfect Design Brief", emphasises the need to focus on the content themes of a brief, rather than engaging in an interactive process with the client whereby the content naturally emerges. He proposes a number of content themes in a design brief which are briefly outlined below.

Project Overview and Background

Phillips articulates that this part of the briefing process must articulate the scope of the project, the business needs and objectives of the project, the desired outcomes, and ownership of the project. He further explains that this part of the brief also serves as the executive summary, "rich in information without being too long or labored" (Phillips, 2004: 30).

Category Review

Phillips defines this as being a review of the industry and context within which the company is operating, or "in which the product/service is involved," (Phillips, 2004:33). In short, this stage serves to define where the organisation and its products/services are in terms of trends, competitors and self. If the brief identifies these factors, this will help direct the project in the right manner.

Target Audience Review

According to Phillips, this is the most "understated section of a design brief" (Phillips, 2004: 37). He iterates the necessity of visiting and questioning target groups and identifying them in depth – not just by age, but by more explicit characteristics.

Company Portfolio

This stage in the process serves to define the organisation and its activities as wholly as possible. This could also include views, ethos, underlying nuances and corporate values.

Business Objectives and Design Strategy

This is the most important section, but according to Phillips, the one that is most often omitted. Phillips argues that for a design solution to be effective, it must solve a problem – granted, that goes without saying. However, the problem must then be clearly stated, but also, the business objectives of the solution must also be articulated. Only then, according to Phillips, can "a coherent design strategy be developed" (Phillips 2004: 31). Phillips argues that if the business objectives were outlined at this stage, very clearly, then the design strategy would be underpinned by these core business objectives.

Project Scope, Time Line and Budget (Phases)

These are the necessary operational details which help frame the brief. A Gantt chart may help illustrate this, with key milestones identified.

Research Data

These are the research questions needing to be answered in the design solution.

Appendix

Any additional information which is particularly lengthy is added here. This could take the form of scoping studies before brief construction, or market research reports.

Executive Summary
This is also the project overview and background, to clearly define the project and objectives, followed by a comprehensive discussion of target audience. The next part of the executive summary will be a discussion as to how the design strategy is linked to the business objectives. And finally, the phases, which includes project scope, time line and budget.

Briefing: The Need to Embrace Spontaneity
Phillips provides a highly worthwhile contribution to the literature of design briefing, by providing a sense of structure and order to what seemingly is a haphazard and complex process. However, we suggest that there are limitations to the application of his proposed process.

Phillips' work is mainly concerned with the graphic design industry and the management of in-house design teams. As more and more design projects move towards becoming inter-disciplinary, crossing the boundaries between graphic and interaction design, interior design and branding, the process needs to be more flexible in its application. Therefore, the fact that Phillips' work is based on his experience of one discipline suggests it may be difficult to apply his principles outside of this domain. In addition, the fact that Phillips' work is mainly based on the work of in-house design departments suggests that his principles may not take account of the more problematic role that an external design consultancy may have. Consultancies face a more challenging situation, as the information surrounding their client's business is not as freely available to them. They have to make more of an effort to "get under the client's skin" and to probe into the culture and values of a new organisation for each job they undertake.

In their study of client and designer relationships, Bruce and Docherty (1993:416) highlight trust as being paramount for extracting information. They found that "an intimate working and personal relationship with a client is considered conducive to, and necessary for obtaining the quality and understanding, which makes for appropriate design solutions". In addition, they emphasise that building strong relationships is "particularly important for the designer to obtain information". Therefore designers need to become adept at forming strong, trust-bound relationships with their clients, and the briefing process must provide a framework for enabling them to do this.

Whilst this paper does not support the idea that briefing should be completely unstructured and left to chance, there must be space for interaction, flexibility, and spontaneity. If the process is too structured and "to-the-book", this may damage client-designer relationships developing, and may actually stifle the interaction between client and designer – their excitement and enthusiasm which could drive the project forward, their relationship becoming deeper and more trust-bound, and more importantly, the new knowledge and creativity emerging as a result of enhanced and joint participation. Indeed, this is borne out in the findings of this paper.

Tomes, Oates and Armstrong's work (1997) has given valuable insights into design briefing as a more inclusive, negotiated and flexible process. They have described design briefing in terms of a "verbal-visual translation", whereby the briefing process moves between verbal and visual – and addresses the gap in communication in terms of designers being more likely to communicate visually, whilst the client communicates verbally – a skill which some designers with less experience may find difficult. Indeed, the development of visual communication through the design process can be regarded as a critical means of bringing together the disparate knowledge and perspectives that are essential to innovation. In their recent ethnographic study of design projects, Ewenstein and Whyte consider that "drawings act as a holding ground and negotiation space for different knowledge forms". Tomes, Oates and Armstrong provide valuable insight into the need of fluency between designer and client in formulating a design brief. They have also highlighted the fact that designers are less confident in articulating their ideas verbally, whereas clients expect them to be able to do so. This suggests a gulf in communication, which could hinder a fluid and mutually satisfying briefing process.

This paper will now build upon the work of Tomes and Armstrong in outlining how designer and client can engage in a mutually satisfying, fluid, interactive and enjoyable briefing process, which, for external design consultancies, can lead to long-term relationships with clients, and additionally lead to the client's experience of briefing being enhanced, by actively engaging and educating the client throughout the process. Furthermore, we will outline guidelines for a fluid yet structured, mutually satisfying briefing process, with high

energy and interaction. This process, based on the findings from the authors' fieldwork also seeks to educate designer and client throughout the briefing process.

Case study method

In order to understand the nature of design briefing and how it actually operates within industry, the research is concerned with accounts of actual employees within the case study. Therefore an inductive, qualitative approach was adopted. In order to examine the phenomena of new knowledge emerging through interaction between the participants, the research methodology was carefully constructed to gain rich data from a holistic perspective. The research design employs case study analysis, defined by Stake (1981, p. 4, cited in Merriam, 1991, p. 13) where "previously unknown relationships and variables can be expected to emerge from case studies leading to a rethinking of the phenomenon being studied". In addition, case study research can be seen as a suitable methodology where a holistic and in-depth investigation of phenomena is needed (Feagin, Orum & Sjoberg, 1991).

Case Selection
The case was selected on the grounds of suitability to the research, in terms of quality of data gathered, and access. The co-author is deeply embedded in the research case, having worked in this company for three years. This enables rich access to data necessary in a holistic inductive study of this phenomenon. The company chosen, Graven Images Ltd, is a cross-disciplinary design consultancy, specialising in graphic, interior and exhibition design. The company's thirty three employees work across traditional technical specialisms for a client roster that includes the BBC, Standard Life and Radisson SAS. The company had a relatively loose briefing structure in place, usually carried out by more experienced designers. However, during a re-shaping of their briefing process, and the development of a new briefing tool, less-experienced designers can now engage in the briefing processes with confidence, contributing to their personal development.

Data Collection
The data collected in this study has come from four main sources:

- A series of workshops facilitated by one of the authors in a leading UK design consultancy;
- Observation carried out by one of the authors in this leading UK design consultancy.
- Interviews with staff from the design consultancy, and other leading designers
- A discussion between the authors regarding their knowledge of design briefing in the literature and personal experience

Interviews
Twelve in-depth, semi-structured interviews were conducted, ranging from twenty minutes to two hours in length. The participants were selected in order to give a fair representation of the company. In addition, two in-depth interviews were carried out with leading international designers, to validate the data and test certain issues.

A topic guide was used to form the framework of the interviews. The topic guide has been described as "A résumé of the main areas of interest to be explored... designed so that whilst covering the general areas of interest it should allow unforeseen areas to emerge." (Easterby-Smith, Thorpe & Lowe, 2002, p. 37). This provided some structure to the data collection to ensure the desired areas were covered, whilst allowing freedom to explore issues that naturally emerged as the interviews progressed. The interviews were digitally recorded.

Observation
The author, as participant observer, has also carried out eighteen months of observation at Graven Images. The data gathered in this context is rich and original, given the author's unique access to the participants, gained from having worked there for three years. The observation data was gathered through daily journals by the author, reflecting on the working day, and interactions between colleagues. All participants were told of this at the commencement of the study, and because of the author's close relationship with them, there is a high degree of mutual trust felt between all, and integrity shown by the author (and known by the participants) and therefore, the observation was unnoticed and relaxed, but very in-depth.

Staff Workshops at Graven Images
Two workshops on design briefing also forms part of this

paper's findings. In the first workshop, 23 staff agreed to take part in these workshops, held at the company's studio in Glasgow. The participants were asked to take a brief from the same client (to ensure continuity). The author then held a session with the participants to explore the concept of briefing further, in terms of its complexity and difficulties. The data was gathered by recording the sessions on DVD and then transcribing the sessions in order to extract broad themes and then categories, and qualifiers. This was further validated using the topic guide.

During the second workshop, issues which emerged from the findings of the previous workshop were validated and refined. Twenty five staff members participated in this three hour workshop, and all staff agreed it made them think more positively and confidently about design briefing. In particular, new designers with less professional experience agreed that the emphasis put on the client's business was a perspective they would now consider more deeply. In addition all designers enjoyed the opportunity to learn from their peer designers through the discussions and activities during these workshops.

Data Analysis

The interviews, and workshop proceedings were recorded digitally, and then transcribed. The data was analysed using the process of coding, as defined in Strauss and Corbin's grounded theory approach. This approach requires the researcher to be sensitive to the data, and able to notice emergent themes and categories during analysis (Denzin & Lincoln 2000, Strauss & Corbin, 1990). This method was adapted and will now be described.

Stage 1: Audit of Existing Knowledge of Design Briefing
This stage was necessary to bring together the authors' previous knowledge of the concept of design briefing. This stage was fundamental in the recognition and development of the new guidelines for briefing identified in the research, as it helps to capture how the previous knowledge had shaped the new knowledge. The co-author's personal journals and observation notes were consulted, and the themes that emerged during learning were noted in order to be in a position to compare the new observations from data gathered in the case study in this research. In addition, both authors engaged in a semi-structured discussion on their existing knowledge of briefing as a means of capturing their areas of knowledge, and which themes were deemed as needing further research in the literature.

The act of recording these themes, as aforementioned, is a means of making this knowledge explicit for accurate comparison in the latter stages of data analysis.

Stage 2: Identification of Broad Categories of Examples of Design Briefing Factors from Interviews and Workshops
Beginning with a focus on the interviews, the interview transcripts were analysed seeking patterns and variance in descriptions in design briefing tools. Categories of techniques and important factors were drawn out from all interviews, and then probed through further examination of the transcripts.

Stage 3: Revising and Building Upon These Initial Categories Using Cross-Cases From Observation, to Frame into Single Factors
These initial categories were then examined by analysing the observation data, to validate the categories formulated. In addition, further categories which emerged were then cross-examined with the interview and workshop data.

Stage 4: Validating These Factors Using Qualifiers From All Fieldwork And Further Observation, and Formulating the Actual Guidelines From These Factors
These factors were then cross-examined using qualifiers from all data collected. The explicit identification of these factors was followed by further qualification and verification of these issues through seeking further examples of these from the data. The very act of making these factors explicit meant that further synthesis of the data could be conducted more effectively, as it was possible to actively seek relevant information related to these specific issues. In addition, because the author was extremely close to the data, and because of her experience with the company and employees, was sensitive to cultural nuances, or any impeding factors on the data, such as "buzz-words". Glaser (1978) refers to this skill as "theoretical sensitivity". It is the fact the author works at this company and has a good relationship with the staff, together with knowledge of how the business works, provides her with this theoretical sensitivity.

Case study findings

1. Newly-trained esigners are not confident in asking business-related questions

Tomes, Oates and Armstrong (1997) highlighted the issue that designers find it difficult to communicate verbally. Since then, design as a discipline has come under pressure to be able to communicate to clients the impact that it can have on the bottom line. Designers are now more adept in the skill of communicating their ideas verbally, and so it would appear that this is no longer a gulf in communication between client and designer. However, for a designer to simply be able to communicate verbally instead of visually is no longer enough. Clients want designers to understand their business and are more confident in designers when they ask business-related questions. Phillips (2003) places the emphasis on the need for designers to adapt to the language of business: "The primary challenge for designers is to be able to think more completely in business outcome terms. Traditionally, professional design curricula have focused almost entirely on training people to become designers. Very few prepare designers to become business partners. Often designers will need to learn a new language - the language of business" (Phillips, 2004).

An interview with Terry Irwin, an experienced designer and design educator, illustrates the importance of understanding business:

> "We...and we would do this as soon as possible, would try and get into their place of business, with as many people as we could afford" (Terry Irwin, interview, 10.10.05).

Terry further enforces the importance of designers needing to really understand a business when designing for them:

> "And then pretty quickly we want to go their place of business...and really see how they lived, what is the spirit of the place - I mean, because companies are like personalities, you know, Apple Computer has a completely different culture to Sun Microsystems, which is completely different to Microsoft...different people...and unless you go and walk in the door and really...unless you have gone in an experienced that, I think you can't really deliver an appropriate design solution" (Terry Irwin, interview, 10.10.05).

In addition, 1 in 5 design businesses would like to develop their designers' business awareness (Design Council, 2005).

During the first workshop at Graven Images, it became apparent that the newly-trained designers and some of the more experienced designers did not feel confident in asking business related questions. They enthused about the design-related elements of a project but needed prompting to address the business-related part of the brief. Suggested questions from the tool prompt included "who is your market?" and "what are the current industry trends?".

One designer remarked that they would feel uncomfortable in asking business-related questions:

> "I'd feel a bit stupid asking about industry trends" (Participant 8, workshop 1).

In addition, during the natural lulls and gaps in a conversation about briefing, even though the briefing tool prompt outlined specific business-related questions which the designers had all agreed were important beforehand, on the whole, the designers were reluctant to ask these – even when there was a lull in conversation. They tended to talk about design-specific issues to fill a gap (whether a building was listed, for example), almost as if they were using their design knowledge as a safety net.

This is clearly a problem. If designers—who are not founders—do not tend to ask business-related questions, then how are they going to gain access to the client's tacit knowledge about their business? This certainly suggests the need for the subject of business to be introduced and taught in as part of the design undergraduate curriculum. Prendiville (2005) has contributed to this debate surrounding design education significantly by drawing the similarities between business studies and design history. Prendiville (2005) suggests that because these two seemingly different subject share similarities, they could be taught to product design students simultaneously, as they are not too dissimilar subjects. In addition, Gornick (2002) has tirelessly emphasised the need for industry-based research projects for graduates to help them understand the commercial world they will be working in.

2. Briefing is most effective when client and designer exchange their domain-relevant knowledge

Domain-relevant knowledge exchange is prevalent in the briefing process, and this is the real holy grail of briefing. Imagine the scenario: the client and the designer sitting at the table, each with an abundance of their own domain-relevant knowledge. The designer has a great deal of knowledge about design, and the client has a great deal of knowledge about their business. As Terry Irwin (2005) puts it:

> "To me it's more like a discovery process. They want to find out about you...you want to find out about them but you also want to find out about their organisation".

In order to inform the briefing process, i.e. to gather enough information to form a brief, the exchange of this domain-relevant knowledge needs to occur. The domain-relevant knowledge of both client and designer needs to be made explicit—ideally, an optimum trade-off between the designer's expertise and knowledge in design, and the client's experience and knowledge of their business. Both are deemed as central to the briefing process. On one hand, the design information related to the project is terribly important—the designer needs to know that information:

> "I think that the project-related stuff is stuff we would ask for naturally...there is no question about that—we have to find that information out otherwise we cannot do anything" (Participant 8).

However, the designer also needs to know about the business in order to design for the client's business, shareholders and users and also to understand the context of the project. In addition, clients feel that the designer has his or her business interests at heart if they take an interest in their business and extract the business information; they need to be genuinely interested in the client's business. Both sides are important, and during this study, the designers agreed.

The co-founder of the company expressed the need for business-related information to drive the brief, at the very start:

> "From the beginning...before the project starts...I think in every case we have to understand the business argument as well, so its like "you want us to design something...well what is the business case for doing that? What are your financial objectives? What are your cultural objectives? What about behaviour?" (Participant 1).

Through the workshops held in this research, by highlighting the importance of both of these opposing sides of the brief, designers are more aware of the fact that they need to gather both types of information—and the consequences of failing to do so, thus resulting in these designers gathering more complete and holistic briefs. The industry can take heed from this important breakthrough in design briefing.

3. The briefing process is driven by process, yet framed by content

Phillips (2004) argues that content is important in briefing. However, it is the process; the interaction and dialogue between client and designer that produces the information specific to that situation—therefore it is the process that is important. If designers focus too rigidly on the content of the brief, and try to use a rigid format for the sake of gathering correct content at the expense of letting the process "flow", then they could actually miss out on vital information and creative energy which inherently emerge during a fluid briefing process. It is both process and content which are inherently important, however the process will allow the correct content to emerge. One designer emphasises the importance of getting the content themes of a brief right:

> "I think that with the process...I mean one of the things that is really fundamental in that process is that it's not like a series of separate questions...it's a conversation..." (Participant 5)

Another designer feel that the content is not important, it is the process of asking the right questions—which may be relatively open:

> "Problems aren't usually that specialist - they are usually quite general things that are often common sense based -- and it important that you listen and ask questions and take an interest. If you know nothing, then take an interest. Always be interested. Always

ask questions...that is when you start to find out really useful things" (Participant 5, workshop session 2).

It is our view that it is the process that drives the content. If one were to use a rigid template, it would not be applicable to every project at Graven as there are graphics, interiors and exhibition projects, and every project is different. This can be said for any company, as undoubtedly every project is different, even if it is in the same discipline. Therefore, you would have to devise a new template for every project. However, if you are experienced in the briefing process, the content will emerge no matter what the project entails; the principles are the same for extracting different content.

In briefing, the designer is experienced in design projects, whereas the client may not be. The designer therefore has the confidence to take the client through the process, making sure that the correct themes (content) are covered along the way. S/he focuses on getting the process right, such as making sure the relationship is built steadily, and the culture is open to encourage trust and creativity, mutual learning and enjoyment. It is clear that through building trust and long-term relationships with clients that this tension can be managed.

4. The brief must focus, but must be broad enough to inspire
The aim of a brief is to frame the project. The scope and parameters are defined, as well as timeline and key project phases. As one designer put it:

> "It is important to have a set scope of work – and then it stops the client moving the goalposts slightly – and extending your remit when you have not budgeted for that" (Participant 8).

However, the brief needs to inspire, as one designer remarked:

> "I need to be inspired by the brief...a stepping stone. It brings out a few things—that we just need to have dialogue about" (Participant 9).

This new observation carries with it a strong push and pull tension. On one hand the client (and to an extent, sometimes designers, and their financial department) is fighting for the brief to be simple and defined, and very concise. The designer does agree, in some cases, and a brief that is too broad can be confusing and uninspiring. Yet the tension strikes when the designer clashes with those who want the brief to be concise, (and this can mean a clash with himself!) and the desire for the brief to be broad enough to inspire. This is a clear tension.

This new observation although prevalent and challenging, helps to focus the designer on the project. They are careful when extracting the project brief and engaging in the process with the clients, that they gather enough "soft" parts of the brief to inspire, yet they have to make sure they detail their scope enough to pin down the parameters of the project, and to extract the finer details of budget, sign-off procedures and timescale. Through the practitioners at the company actively addressing these two conflicting elements of a brief, the briefing process can be more informed. Practitioners will be more focused on the process holistically, as they know the "nuts and bolts" of the information they have to get rather than just getting enough to inspire. The value in structuring the process was positively viewed in the company:

> "This is a marvellous thing. It (the process) needs to be captured so that others can learn from it" (Participant 10).

5. Roleplay can add a new dimension in understanding a project brief
This builds upon Tomes, Oates and Armstrong's emphasis on the verbal-visual translation as enhancing communication. At Graven Images, clients are actually taken on a journey and involved in every stage of the process. The studios designers actually place themselves in the role of the user and encourage the client to do the same:

> "I think that this is a really important method—and a really important part of the process—I think that in this team it would be good to put someone else's hat on because then we can just learn from it. Like Aunty Betty is 90. How is she going to use this space? Where is she going to go? And it is really fascinating just to do that. It's like that's the company, that's the project. This could be a way of finding this out—asking those questions to yourself in the shape of Aunty Betty—be her and ask yourself those questions" (Participant 6).

Conclusions

When we dance, we share knowledge, reach mutual understanding and create a worthwhile experience that fulfils some sense of a shared objective. And we have fun. That shared knowledge and mutual understanding provides the basis for our objectives to be more ambitious the next time we hit the dance floor with our partner.

So it is the same with design briefing. This paper has emphasised how it is the process that is critical, providing the means by which knowledge can be shared, content defined, and focussed objectives agreed. Design briefing is a complex, unpredictable process that is not conducive to prescribed methods of support. "Strictly ballroom" is a rigid approach to briefing which suppresses the energy and mutual learning which a "dancing in the moment" approach nurtures. In order to be able to "dance in the moment", designers need to be able to be confident in asking the client about their business, and for the sake of the future of the design industry, this skill should not be left to develop from experience alone, and indeed may take years to develop. However, from our research it appears that the experience of "dancing in the moment" can be a liberation for designers, providing an engaging and challenging context for their practice, and a means of working in harmony with a commercial partner. This is particularly important in the fast changing new context of design in which the relationship between client and consultant itself is of critical competitive significance. Gornick (2006) has argued that we are shifting from 'design consultancy' to 'innovation consultancy' in which strategy and creativity become intertwined: "We can begin to see complementary goals and processes emerging between companies and their design consultants, giving their collaboration the unique value of being both creative and strategic. Long-term success goes to the designers who can deliver a fusion of strategy with creativity in their client relationships."

The urgent need facing the design community is two-fold. First we must explore approaches and tools that encourage and enable more flexible and responsive approaches to briefing to develop. Second, it is apparent that design educators and the design curriculum need to build the confidence of designers to work in partnership with business. This is about building skills in communication, collaborative working styles, and creative partnerships. Designers must be able to talk the talk, walk the talk, and dance the talk.

It is time for the curriculum to change, and, like the design industry, become more inter-disciplinary. This move to inter-disciplinarity in the design industry has evolved as a result of the industry becoming increasingly competitive, with consultancies collaborating with other disciplines to make their design solutions and approaches more holistic and relevant to their users. It is time that the design curriculum did the same.

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TODAY'S ILLUSTRATION.
REPRESENTATIONS OF A DESIGNER'S WAY OF DESIGN THINKING

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Abstract

This paper intends to contribute to the general issue of design thinking by discussing how today's design recovers and uses illustration as a language (with it's own syntax and semantics) in order to communicate visually. It results from an ongoing research project that is studying illustration in design and the way in which design can offer innovative solutions by using this expressive resource.

Efficiency and formal synthesis, which reached their climax with modernism, are today tending to adapt to the current times of idleness, individualism, self-reference and the desire for singularity. It is in this context that formal solutions using illustration appear, breaking away from the truth that photographic imagery formerly sought. These "pictorial narratives" offer stimuli to the receiver and initiate associations, images and memories that support thought, close that which we find in the patterns of emotional design (Donald Norman).

Contrary to the traditional sense of illustration, which is to decorate and bring to light a unique meaning, contemporary illustration contributes to the appearance of a symbolic level, starting with its own mode of design thinking (Nigel Cross, Nagai and Noguchi, Gabriela Goldschmidt). The illustrator is a construer of senses and he achieves this though illustration design. The illustrator is, in this way, illustrating himself.

After the initial euphoria of the potential solutions that digital technologies were offering, today there is a return to hand made illustration and to the formal valorisation of drawing by analogical means. It is almost as if there has been a refusal of artificial and exterior means and the body has been called upon once more to participate and become involved in the creative act (Walter Benjamin).

Illustration as a communicational artefact is innovative in the sense that it is the graphical fixation of a transitory order. Transitory because it represents the manner in which its author manifests his "inner order": transitory because it depends on the receiver to complete it (an "outer order"). Illustration realises itself as an interface between these inner and outer orders.

In this paper, examples that reference the absence of design illustration and examples that reference their recourse and importance today are presented.

The interpretation of these examples contributes to the clarification of the proposed objectives.

Keywords: Illustration, design thinking, drawing, image, innovation

1. Introduction

The "designerly ways of thinking" a phrase used by Nigel Cross to define what he calls "natural intelligence in design", holds that there is something specific or special in design thinking that distinguishes it from other forms of thought.

A definition of design has been sought in the past using different approaches. Positivist theory, with its special interest in methodologies, conceived design as a rational activity that is essentially geared toward solving problems.[1] Constructivist theory used a different approach, seeing design as a process of reflection in action.[2] Today, however, the ontology of design is taken to consist of the construction of senses.[3] Kazmierckak defines design as "meaning making", "cognitive interface permitting the reconstruction of the particular senses that are sought"[4], while Klaus Krippendorff describes design as "a sense creating activity".[5]

It is from where these two principles overlap that the hypothesis arises that design thinking and the construction of senses in design enjoy specific conditions. This change of paradigm gives the designer a primary role. He is not only someone seeking a solution (albeit hypothetical) for a problem[6], rather he is a semantic agent, interpreter of a desire and producer of meaning through the forms he produces. From the viewpoint of design research it is necessary to understand what instruments and poetic resources accompany the designer in the process, and to evaluate the resulting configurations.

2. On illustration

"So natural is the combination of picture and writing that men of many times and places have believed the picture to be consubstantial with the thing or being that it represents"[7] (MELOT, 1984:8).

The etymology of the word *graphic (graphein)* provides a common origin for the acts of writing and designing. Throughout history, words and images have shared the same media, coexisting in multiple communication artefacts and almost always contributing to a common objective– the communication of an idea – doing it through the individual specificity of each language. Illustration emerges from this *dialetic.*

The common understanding of illustration describes it as a language with a function of explaining and clarifying a text that it complements and sheds light upon. It thus placed illustration in a position of dependency and subordination –"secondary images, neither derived nor original, rather repetitions or duplications, and hence redundant".[8] The word illustration also implied as "(...) images created by a technical process that can be duplicated; woodcut and wood engravings, copper and steel engravings, etchings and lithography. Hand-painted images executed individually and painting in books are distinguished from these as 'illumination'".[9] Illustration assumed an essentially didactic character, the use of which was justified by the need to make texts comprehensive for the less literate, with a mission "to perform the function of the democratic dissemination of knowledge"[10] (MAREIS, 2006:4).

The descriptive function that illustration fulfilled in relation to text (and therefore so often referred to as *illustrative drawing*), is nonetheless replaced today by a desire to bring to light new semantic relations and meanings, represented in original poetic formal solutions. It rejects subjection to a given programme or the limitations of its media, transposing

[1] SIMON, Herbert A., 1996. The Sciences of the Artificial. 3rd ed. London: The MIT Press

[2] SCHÖN, Donald A., 2005. The Reflective Pratitioner. How Professionals Think in Action. Great Britain: Ashgate

[3] PROVIDÊNCIA, Francisco "Algo más que una hélice" in CALVERA, Anna (ed.), 2003. Arte?Diseño. Barcelona: Editorial Gustavo Gili.

[4] KAZMIERCKAK, Elzbieta T., 2003. Design as Meaning Making: From Making Things to the Design of Thinking. Vol. Design Issues, vol 19/2. Massachusetts Institute of Technology

[5] KRIPPENDORFF, Klaus, 1995. in MARGOLIN, Victor e BUCHANAN, Richard (editores). The Idea of Design, A Design Issues Reader. London: The Mit Press. p.156

[6] A problem that he often defends as one that still requires definition. Even understanding the objective of the design, the solving of problems, the role of the interpreter of the designer cannot be annulled.

[7] MELOT, Michel, 1984. The Art of Illustration. New York: Rizzoli International Publications,Inc.

[8] FRADE, Paulo A. S., 2002 "As Antinomias Do Desenho." Tese de Doutoramento. Porto. p.353

[9] MAREIS, Claudia, 2006. *Illustration – an attempt at an up-to-date definition* in KLANTEN, Robert and HELLIGE, Hendrik (editors). *Illusive. Contemporary Illustration and Its Context*. Berlim: Die Gestalten Verlag GmbH & Co. KG

[10] op. cit., p.2

its limits into symbolic and dense forms. It looks upon itself as a "lie"[11] and it is precisely here that it finds its own destiny. As a lie, it is free, unlike photography, to escape the truth, to tell it in another way, to reinvent meanings for it with no need for any reality except its own.

Illustration, apparently forgotten and out of fashion, could now embrace its new soul.

Ian Noble recognises that "illustration –itself a part of graphic design, and certainly a discipline that is intrinsically linked to design through the process of commission and collaboration - has undergone a period of significant redefinition. The activity and practice of illustration and image-making has now grown to accommodate a wider range of approaches"[12] (NOBLE, 2005:B).

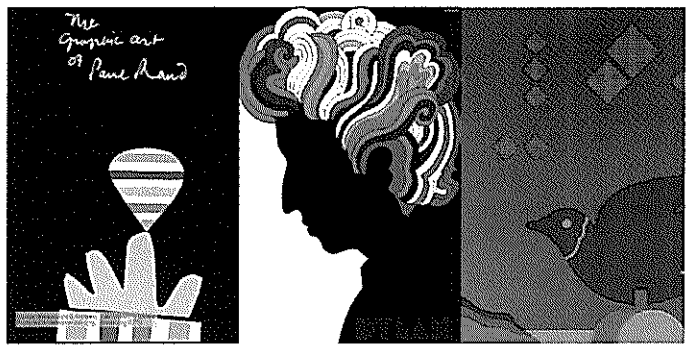
Mareis states that "It is no exaggeration to say that illustration is undergoing a renaissance today. (...) It has woken from its lengthy slumbers, and is promoting itself more than ever as a poetic, expressive and above all independent design discipline".[13]

The place of illustration and image making are clearly appreciated in the context of contemporary design. Today, more than ever, the frontiers between what is drawing, painting, illustration and design are fading. If we try to explain illustration here, it is because we recognise the advantage of giving this process a name in order to understand it.

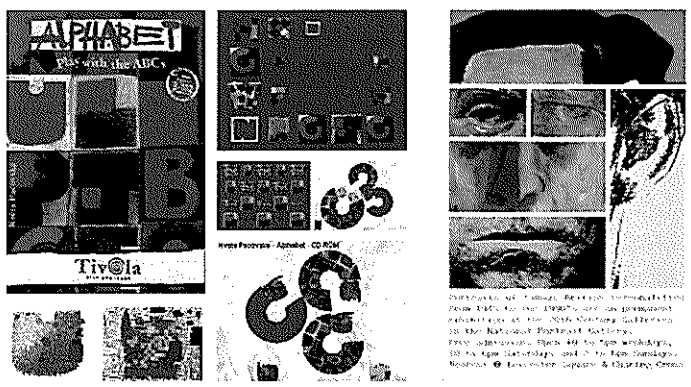
It seems to us that the time is ripe to reflect upon illustration and its phenomenology, since that which is *said* today goes far beyond the text that inspires and orients it. It is therefore useful to considerate it here as a process of thought and construction, a place of doubt, choices and revelations and to set it free to serve other purposes, applying its name to the *action* of designing. To that end we consider two fundamental aspects: the formal questions: the plastic and expression of illustration on one hand and the content of illustration on the other, that is, illustration as a communicational artefact and witness of experience.

3. Design through illustration

What state of being involved does a Paul Rand (Figure 1), a Milton Glaser (figure 2), or a João Machado (Figure 3), poster propose to the reader? And the compositions of Sebastião Rodrigues? And the colours of Pacovská (Figure 4), or the humour and charisma of Alan Fletcher's design? (Figure 5)



Figures 1, 2, 3



Figures 4, 5

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[11] "Paper Lies". The term serves Nuria Sauri to introduce the concept of illustration. Paper, as a support medium, ties illustration to the world of senses, gives it body and substance. But with digital technology, the image looses its materiality. There is no original or proof of its physical existence. The real stops being "what exists in truth; what is not imaginary", but reencounters the sense contained in its etymology: res, "thing", all that exists or could exist really or in abstract." The contradiction that Magritte consecrates with the famous "*Ceci n'est pas ume pipe*".

[12] NOBLE, Ian and BESTLEY, Russell, 2005. Visual Research. An Introduction to Research Methodologies in Graphic Design. Lausanne: AVA Publishing.

[13] KLANTEN, Robert and HELLIGE, Hendrik (editores), 2006. Illusive. Contemporary Illustration and Its Context. Berlim: Die Gestalten Verlag GmbH & Co. KG

We cannot disassociate these examples from the author that created them, because the drawing of each one of their illustrations confirms their identity and the way they think design. The work they create influences and orients the reading of the idea to be communicated because it is impregnated with their authors' own ideas, opinions and convictions. We feel it in the colours, in the composition, in the metaphors used. Understanding the whole, the image and the intelligence that flow over from the creative process can simultaneously be a source of pleasure for the reader.

The illustration project allows the designer the space for freedom, both semantic and affective. It provides the illustrator with contact with the works of others and therefore, like an actor, the illustrator has an opportunity to experience other existences. In this sense each illustration is a renewal, a possibility for a (virtual)[14] programme.

The unique thinking of the designer/illustrator is discovered in the dialetic between the words and the images. This is the *illustratorly way of thinking*, which we believe to be the cognitive process implied in the act of illustrating. It is therefore defined as a *poietic* act[15], since it is an intellectual process of reasoning associated with a practice that makes this thinking concrete. *Design thinking* is also about *doing design*. It is expressed by *designing the design* and by the accomplishment of the object/thing of the design: "(...) design thought process is the designer's creative expression process".[16]

4. The "illustratorly ways of thinking"

We live in times of idleness, individualism and the desire of individuals to leave a personal mark in the world. There is also a tendency towards *femininisation*, the cult of beauty and ornament. Men have lost their fear of showing themselves as sensitive and have revealed it in their daily habits, clothing, colours, objects and attitudes they adopt. What was considered different before is today considered to be original.

After the euphoria for the digital, the excessive use of virtual technological media, the "stylistic mannerism"[17], and the minimalist mannerism that arose from there, tiredness with a too perfect, too cold and distant language and a refusal to accept it followed. Recent contributions at the levels of neurophysiology and emotion[18] also provide a deeper reflection (and less intuitive) about the effects of the artefacts on the user, the user's reactions and in general, the user's interactions. Proximity with the receiver/reader/interpreter thus seems to be a goal that has been assumed by design today.

This context may justify the current appetite for illustration that has become apparent.

O'Reilly suggests the "seductive theory of illustration", justifying: "There's a new communication space opening up for illustration. While the media looks to rationalise a world of information overload, illustrators are being given a licence to speculate and invent, to cut through the chaos of visual messaging." And he calls it "(...) a radar for picking up cultural and social signals".[19]

There is a kind of enchantment and mystery in illustration today. It is no longer hidden behind the meanings of a text, rather it reveals itself in all its intensity. What arouses curiosity and emotional involvement is this ambiguity, a (semantic) space left open, needing to be filled by somebody. It is a kind of game that is played with the reader – a constant discovery through doubt and the impossibility of actually ever knowing it fully. It demands a lot of the reader. It asserts its involvement in the construction (co-creation) of a joint interpretation, not only of the image but of the entire illustration medium as a whole.

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[14] LÉVY, Pierre, 2001. O Que É O Virtual? Coimbra: Quarteto

[15] NARVÁEZ, Luz Maria Jiménes, 2000. Design's Own Knowledge. Design Issues, vol 16/1. Massachusetts Institute of Technology

[16] NAGAI, Yukari, CANDY, Linda and EDMONDS, Ernest. Representations of Design Thinking, A Review of Recent Studies. In http://www.idemployee.id.tue.nl/g.w.m.rauterberg/conferences/CD_doNotOpen/ADC/final_paper/341.pdf

[17] PELTA, Raquel, 2004. *Diseñar Hoy.Temas Contemporáneos De Diseño Gráfico*. Barcelona.

[18] DAMÁSIO, António, 1999. *O Sentimento de Si. O corpo, a Emoção e a Neurobiologia da Consciência*. Publicações Europa-América: Mem Martins.

[19] O'REILLY, John, 2006. *Illustrology:The visual theory of the future*. In Varoom 01. p.6

Illustration presents us with feelings that we did not know, offers us alternative readings that touch us because they make us think: "No experience having a meaning *is* possible without some element of thought."[20]

Each time we look, there is a detail that stands out. Therefore we have to return there from time to time until we fix it in our memory.

Before the programme (and assuming that the illustrator has the capacity to respond to it), other questions arise, which are possibly essential to the illustration project. How can we identify and offer an experience, or stimulate an emotion? How to represent what is not in a text – the *absence*? The illustrator begins a project with some convictions and a lot of doubts. He knows what he could do but should not be done – to be literal, obvious, immediate, contradict the meaning of the concept or simply translating it into an image. From this point on, the illustrator needs to discover (with the programme in mind) how to substitute the concept with the image, representing what is not objectively present in it.

Although limited by the stillness of the illustration media, illustration maintains the desire to arouse emotion. Recourse to analogical drawing is possibly explained by this wish to be closer to the person that will *feel* the illustration. The sensation of having a finished product is lost. The transparency of the process and the fixation of the gesture are shown. A practice is shared.

The rigour of the representation of the drawing and the technique give way to images with a poetic load that is achieved by deception and by accident, by hesitations and imperfect lines, that denote the presence and mark of the one who created them. Byrne justifies: "The 'good' was so easy to achieve that even a computer programme could do it! The "bad" required dexterity and heart - or at least virtual heart".[21] In this close relation, expression is valued as a special form of saying and doing. Therefore the simulation of manual work and the inclusion of error are often preferred. There we find someone who reveals himself and becomes closer to us by "drawing the drawing".[22] The *thing* that is drawn is the visible evidence of the way the illustrator[23] thinks and feels, and even if in an unconscious way, it holds memory and experience.

The "lie" is not only in the illusion that it communicates, it is also extended to the illustration *mode*. The drawing lies when it creates the illusion of stopping time, of movement, of the unforeseen and of chance. It lies when it seems to result from a process of a casual and free fixation of all constraints (when it is precisely here that it finds its rhetorical and poetical "space of freedom"). They are layers that endure, forms that overlap, adjust and fit, and in this way "negotiate" their place without becoming void.

Deleuze offers a starting point for reflection on what is illustration thinking, since illustration occurs (or goes on occurring) by means of a *construction* process. Deleuze establishes the existence of "two planes, or two ways of conceptualizing the plane. (...) A plan(e) of formed organizations with their developments, the genetic plan(e) of evolutionary developments with their organizations"[24] (DELEUZE, 1999:265).

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[20] DEWEY, John, 1916. Democracy and Education. In www.ilt.columbia.edu/publications/dewey.html

[21] BYRNE, David Nostalgia Por Lo Real, O Lo Malo Es Bueno in http://www.jornada.unam.mx/2004/06/01/03aa1cul.php?origen=opinion.php&fly=1, 2004.

[22] Molina cites Saul Steinberg: "lo que dibujo es el dibujar, dibujar procede del dibujo" MOLINA, Juan José Gómez, CABEZAS, Lino and COPÒN, Miguel, 2005. Los Nombres Del Dibujo. Madrid: Cátedra., 12

[23] It is taken than the individual is a cultural product. Howard Gardner proposes a model for the analysis of creativity, what he calls the "creative triangle", where the individual, other people and the work are. Gottlieb Guntern proposes "The Eco-anthropological theory", in which "an ecosystem (not an organism") is the smallest viable entity on our planet. It consists of three structural entities: reference system (e.f. Organism, couple, family, team, population of a city), the physical environment (natural environment, man-made environment) and the biosocial environment (natural and man-made) and the relationships between the three structural components (defined by exchange of matter-energy and information signals)".

[24] DELEUZE, Gilles e GUATTARI, Felix,1999. *A Thousand Plateaus: Capitalism E Schizophrenia*. London, The Athlone Press

The plane or that which would be the purpose of the project – the object – is hidden: "It is by nature hidden. It can only be inferred, included, concluded from that to which it gives rise (...)". This could be "the illustratorly ways of thinking", thought in which words and drawing are combined in crystallised moments in pre-illustrations, in the sense that in each one of these configurations, a little more of what is being communicated is being found and uncovered. The word implies the drawing and the drawing implies the word, in an evolutionary process of production of provisional senses in which intuition has an essential role. The active participation of the illustrator in this process – intellectual and gestural – makes the illustration space a place of experience and *construction*. This is an essential concept in the aesthetics of Deleuze and one which could translate that which today is the *mode of making* illustration.

We consider illustration to be the interface between the *inner* the ideas, emotions, experiences, memory and time of the illustrator; and the *outer* of ideas, emotions, experiences, memory and time of the receiver – a "space of fluxes".[25]

Illustration will therefore be an ephemeral and transitory order that oscillates between the order (and feeling) that is fixed in a precise moment by its author and the order that is attributed to it by each receiver (interpretation) in the moment and space of reception.

5. The paths of illustration. Design innovative solutions by means of recourse to illustration

> Contemporary graphic design is not always concerned with problem solving, or operating in relation to a client's brief. The exploration of a theme that interests the designer, and the graphic response to that theme which might enlighten and help to describe new visual languages that are applicable to other graphic solutions, is a core part of the research agenda. In effect, this places the design methodology itself as a central component of the design process. The testing and development as a visual vocabulary relevant to a specific context may then be further developed in order to address a number of problems within that same context[26] (NOBLE and BESTLEY, 2005:100).

What stands out clearly in Noble's idea is the advantage of developing new approaches from a brief, with the interpretation and methodology applied by the designer being essential to the process.

And he concludes: "The resultant design propositions are then both the combination of a personal exploration of the subject and a nascent visual language that operates within a set of predetermined objectives".[27]

The current design of illustration involves the drawing of experiences and emotions, more than translating concepts. Being a process centred on the individual – designer/author – it reflects its reading of current times. It could, in this way, constitute itself as a mark of time, simultaneously proposing pictorial vocabularies that are available to be applied and communicated. As mentioned, they are possibilities, updates, and they the deserve certification as such. Zuccaro used to warn: "In the same way that a mirror eliminates all those aspects that are not visible and so cannot be reflected, the image-design also eliminates those traces that the (mental) design does not recognise, and so excludes. Therefore the decisive factor in the configuration of the image is the subject, not nature. (...) By tipping the balance in favour of the subject, the subject can never verify it, because all verification is only the verification of a project".[28]

The responsibility of the illustrator is increased in the sense that the bigger decisions of the project fall to him and there are no measures or formulae to justify his work. And as for the reader/receiver, it is easy to allow oneself to be seduced by the illustration that he imagines.

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[25] The term "flux" is used by John Tackara and Mihaly Csikszentmihalyi

[26] NOBLE, Ian and BESTLEY, Russell, 2005. Visual Research. An Introduction to Research Methodologies in Graphic Design. Lausanne: AVA Publishing

[27] op. cit.

[28] BOZAL, Valeriano,1987. Mimesis: Las Imágens Y Las Cosas. Madrid: Visor. p, 136.

We would say like Milton Glaser;

> *Less is not necessarily more.* Being a child of modernism I have heard this mantra all my life. Less is more. One morning upon awakening I realised that it was total nonsense, it is an absurd proposition and also fairly meaningless. But it sounds great because it contains within it a paradox that is resistant to understanding. But it simply does not obtain when you think about the visual of the history of the world. If you look at a Persian rug, you cannot say that less is more because you realise that every part of that rug, every change of colour, every shift in form is absolutely essential for its aesthetic success. You cannot prove to me that a solid blue rug is in any way superior. That also goes for the work of Gaudi, Persian miniatures, art nouveau and everything else. However, I have an alternative to the proposition that I believe is more appropriate. "Just enough is more" (GLASER, 2001).[29]

Thus it is for the illustrator to decide what is the measure - what is *just enough* in each project.

Illustration as an artefact of communication is therefore a witness the a conflict resolved by the illustrator – the need to communicate a concept by his thinking and an interpretation of the social, ideological, political and cultural context in which he carries out his work. Through a discourse made through images, it reveals an attempt to establish an order – "the best posture is not in the absolute sense but in relation to a sought purpose"[30] - starting from the *disorder* of objective and subjective elements inherent to the programme it must respond to. But it is also an order in which the Homo Ludens prevails, not an imposed order but one that allows the illustrator and those who come into contact with the illustration to experiment with different interpretations.

In the probable course that it will follow, illustration should maintain, in itself, that which is essential: Its narration, communicating ideas by means of image. It should reveal not only one but various stories. The hidden stories in the brief, the story of its author and the story if its time, converting itself into experiences and thus into a story for anyone who cares to stop and contemplate it.

In this text we have tried to contribute to showing how illustration as a language, as an effort to communicate visually, is among contemporary themes that go to explaining design thinking, proposing it to have a syntax, semantics and poetics of its won, and as a potential form of original narrative and graphical solutions.

By including illustration in the ambit of design research, we are seeking to restore it and understand it as an essential practice in communication design and human communication. Once revived, the practice accompanies many people throughout their lives.

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[29] GLASER, Milton, 2001. Ten Things I Have Learned. In Aiga Talk. www.miltonglaser.com/pages/milton/essays/es3.html

[30] Tomás de Aquino in ECO, Umberto, 2005. História da Beleza. Lisboa: Difel. p.89

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Figures:

Figure 1: http://mssa.library.yale.edu/derivatives/mss/1745/zoom/008075.jpg
Figure 2: http://www.wtamu.edu/~bcaruthers/glaser.jpg
Figure 3: http://www.1worldart.com/A4W/images/machado_170.jpg
Figure 4: http://www.analucia.net/imsblog/KvetaPacovska/Alphabet-Seuil-1996/alfabeto.jpg
Figure 5: http://www.designmuseum.org/media/item/4815/-1/102_7Lg.jpg

AN EXPLORATORY STUDY OF FASHION DESIGN: DESIGNER, PRODUCT AND CONSUMER

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Abstract

Fashion industry has been undergone substantial transformation over the years. Fashion houses are no longer working with two collections per year – Fall/Winter and Spring/Summer. Many fashion professionals are working with multiple collections and deliveries every season. They are constantly searching for fresh idea and creating new products in order to meet their customer's aspirations. 'Fast fashion' companies have been successfully using various strategies to reduce the production lead time, increase their competitive advantage and expedite the design process.

This research project was undertaken to examine the relationship between designer (ideation), product (innovative design) and consumer (aspirations). Consumption culture was discussed and design issues were identified in this paper. Based on cross-disciplinary literatures, a conceptual design model was developed. This paper is attempted to identify research opportunities for the future, offer recommendations for fashion practitioners.

Introduction

Due to vast technological breakthroughs, our consumer culture has evolved greatly over the last twenty years. We are living in a fast-paced, experience-driven and knowledge-based society where consumers can access and obtain information freely, easily and quickly than ever before. Consumers are much more knowledgeable and aware of fashion trends, design features, and the characteristics and performance of a product. When they shop for a consumer product, they do not merely look for functional values. They often seek for multiple attributes of a product to satisfy their physical needs and aspirations. These attributes include functional, psychological (Kaiser, 1990), emotional (Moor, 2006; Howard, 2001), symbolic (Levy, 1959; Elliott and Wattanasuwan 1998), and experiential values (Holbrook and Hirschman, 1982) that affect the choices they eventually make.

In response to this phenomenon, the fashion industry has been undergone substantial transformations to accommodate the needs and aspirations of the consumers. Fashion houses are constantly searching for fresh ideas and creating new products. They are now working with multiple collections and deliveries every year – the traditional Fall/Winter and Spring/Summer collections per year almost no longer exists.

Fast-fashion (Foroohar, 2005; Frazer, 2006) companies such as Zara, Hennes and Mauritz (H&M) and Esprit have been successfully using agile manufacturing, lean production and quick response strategies to reduce the production lead time, increase their competitive advantage and expedite the design process.

In order to address these ongoing challenges and remain competitive in the marketplace, fashion designers and professionals must consider many other factors beyond the visual design of a garment. It is pertinent to address the relationship between designer (ideation), product (innovative design) and consumer (aspirations). In this respect, a number of questions are raised and addressed in this paper. Questions such as: What constitutes the desires existing within a consumer's mind? How can a designer identify the basic aspirations of their customers? What type of product should a fashion designer offer if today's customers are 'multi-attributes' seekers? And what kind of R&D (Research and Development) methods should be used for this rapid changing industry?

To the best of our knowledge, the trichotic relationships of this particular topic have received only limited attention. This research study was undertaken to further examine the conceptualization, creation and configuration within the design process. Having briefly identified and discussed the nature of today's consumption culture in this paper, a cross-disciplinary research was developed and a case study is presented to support the interpretation.

In the following section, this paper begins with a review of the literature. The next section explains the methodology employed and reports the results and findings. Due to the space constraints, some results have been omitted with only the most important and relevant content of the interviews included in this paper. The conclusions and implications can be found in the last section.

Literature Review

Prior studies have investigated and examined this topic from different perspectives that include consumer product, design innovation and consumer behaviour (Bloch 1995; O'Cass 2004; Pesendorfer 1995).

Consumer and product

There is a substantial amount of consumer and marketing research literature devoted to product attributes. According to Hines and Swinker (2001), consumers often use concrete characteristics and abstract features of a product as evaluative criteria in making a purchasing decision. Concrete characteristics are comprised of intrinsic cues and extrinsic cues of a product whereas abstract features include aesthetic appeal, psychological expectations and performance expectations. O'Neal *et al.* (1990) also pointed out that consumers based quality on five differing dimensions: physical, performance, aesthetic, affective and connotative. The level of consumer knowledge, awareness, familiarity, interest, involvement, or value may also affect how consumers evaluate quality (Hines and O'Neal, 1995). Prior knowledge and experience could play an important role on acceptance and rejection of a product. For example, if consumers become dissatisfied with the usage or performance of a particular product, it might create a negative impact that would play an important role on the acceptance and/or rejection of similar products in the future purchases.

According to the cue utilization theory (Richardson, *et al.*, 1994), today's consumers use different cues in making their assessments of a product (Szybillo and Jacoby, 1974; Dodds and Monroe, 1985; Zeithaml, 1988), and are classified as extrinsic and intrinsic. Extrinsic cues are considered to be lower level cues that can be changed without changing the physical product (e.g. price, brand name, country-of-origin, warranty). Intrinsic cues are high-level cues directly related to the product such as fabric, style and quality (Aqueveque, 2006). If consumers are familiar with the product, they tend to use intrinsic cues for evaluations, whereas, if consumers are not familiar with the products, they are more likely to use extrinsic cues (8rucks, 1985). Researchers have extensively examined and discussed the impact of both extrinsic and intrinsic cues across different product types and from divergent perspectives. In some cases, they focus their study on a singular cue of a product as opposed to multiple cues. For example, the topic of country-of-origin has often been studied as a significant cue in marketing fields (Bilkey and Nes, 1982; Papadopoulos *et al.*, 1991; Cordell, 1992; Ahemed and d' Aston, 1993) and used as the sole criteria for the study. On the contrary, some researchers suggest that many consumers tend to use multiple cues when

evaluating a product rather than a single cue (Jacoby *et al.*, 1973; Simonson, 1989; Szybillo and Jacoby, 1974). In particular, the correlation between brand name, price and quality has been widely discussed and disseminated by many researchers over the years. Brand name is regarded as being a very useful cue when consumers choose from a wide array of competing consumer products. During the buying process, consumers rely on information based on experience from their external environment (e.g. advertisements, word-of-mouth referrals from friends). Positive acknowledgement of a brand name could reduce the perceived risk of a product (Peter and Ryan, 1976), and shorten the decision-making process. 8esides brand name, price may also be perceived as a product quality cue. The price-quality inference or price-quality heuristic has also been studied and investigated substantially in the past (Rao and Monroe, 1988; Rao and Monroe,1989; Rao and Wanda, 1992).

In short, the most salient determinant of product success lies in its inherent value: innovative design, unique benefits, reasonable prices, and high quality.

Designer and Product

Due to technological advancement, fierce competition, and the fluctuations of changing consumer tastes and market demand, fashion designers must response much quicker to the evolving global market, and to create products with 'newness' and 'uniqueness' that differentiate them from their rivals. In order to understand what determines the success and failure of a product, it is essential to understand the design mechanism.

A conceptual model was proposed for this study based on literature review include Don Norman's three aspects of design (see Figure 1). As indicated in the Table, visual design, behavioral design and reflective design are aspects that should be considered when designing and developing a new product for today's consumer market.

Visual Design with Aesthetic Values

The appearance of a product can stimulate an aesthetic response that creates a sensory experience (especially through vision). As illustrated in Figure 2, fashion designers are viewed as an encoder of information sources, the product is regarded as a transmitter of idea and image, and the consumer is considered to be the receiver or decoder. In order to create an aesthetic product that will attract the attention of their consumers, designers constructively and intentionally use various design elements and principles such as line, space, shape/ form, light, colour, texture, pattern, repetition, parallelism, sequence, alternation, gradation, transition, radiation, rhythm, concentricity, contrast, emphasis, proportion, scale, balance, harmony and unity (Davis, 1987) in their designs to shape the appearance and quality of their work.

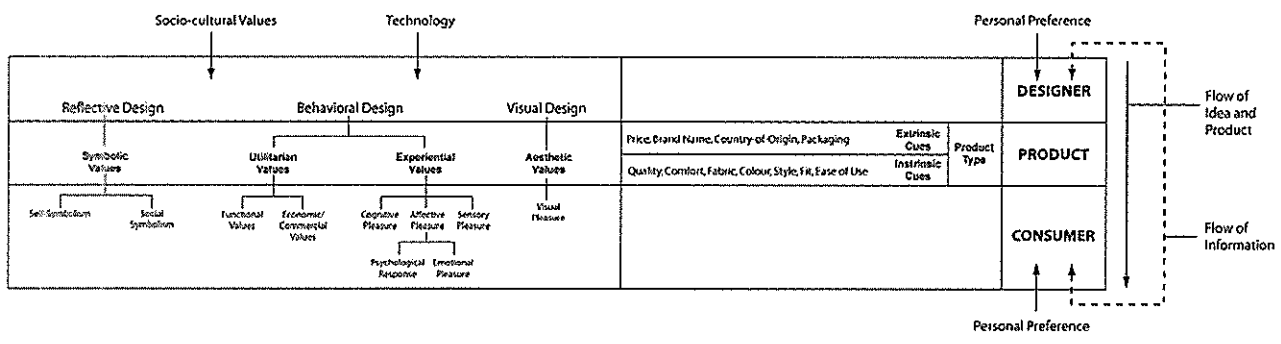


Figure 1. Conceptual Model of Designer, Product and Consumer

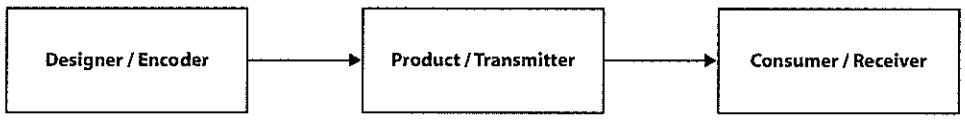


Figure 2. Model of Communication

Behaviaral Design with Utilitarian Values and Experiential Values

Behavioral design is comprised of two primary components: utilitarian values and experiential values. Utilitarian values refer to functional benefits (e.g. fabric, quality, performance, fit, comfort) and economic values (e.g. price). Experiential values consist of sensory pleasure, affective pleasure and cognitive pleasure. Sensory pleasure relates to five human senses of sight, touch, taste, smell and hearing engaged when using a product. Affective pleasure concerns consumer's psychological response and often refers to emotions, moods, and feelings towards an object (Crilly *et al.*, 2004). Cognitive pleasure associates with consumer's experiential history, and his/her current experiences and knowledge of the product.

Reflective Design with Symbalic Meaning

Reflection design signifies the private, social, cultural and symbolic meanings and messages that are imbued in a product during its use. Some consumers may choose a product more for the social image evoked or symbolic meaning attached rather than for its functional performance or sensory benefits.

These three aspects are interrelated with each other. Therefore, they should not be viewed as separate entities. In many cases, the visual form or appearance of a consumer product can enhance the performance properties of a consumer product and offer sensory pleasure all at the same time (Smets and Overbeeke, 1995). As an example, a pair of zip-off nylon pants can offers multiple attributes to the wearers. Self-identity can be constructed, developed or expressed through the product. A layer can be removed to create new style (appearance) and avoid overheating (performance), and the 'rustling' sound created by the movement of nylon fabric may be soothing and evoke a sensory pleasure.

As mentioned earlier, modern consumers no longer seek monolithic features or only a single attribute within a product, and are often demanding a range of multi-dimensional attributes. In order to be successful in product design, fashion designers should not merely focus on 'observable' design features (e.g. silhouette, style line, design details); they should also focus on 'unobservable' design features (e.g. experiential pleasure, symbolic meaning).

Design and its Functians

Design plays a critical role in shaping and forming a new product; the translation, integration and communication of new ideas throughout the process of design and product development are continually being employed. Based on Trueman's (1998) design attributes, there are some ideas that adapt and extend the role of design: communicator, differentiator, integrator and generator. First, design used as a communication tool conveys messages and ideas to the public. Likewise, it can be used as a means of constructing, developing and communicating the identity of the consumer (Elliott, 1999; Sinha, 2002). Second, the use of design can differentiate a product of one brand from other brands. Third, design can integrate new ideas and concepts into the product. Last, good design can generate more business and synergies for a company.

Many research studies have indicated that a consumer's willingness to try on new products was closely related to the level of risk perceived for that product (Popielarz, 1967). In general, innovation and change of a product is likely to increase risk and uncertainty in the short term (Trueman, 1998). Radical innovation such as seen in new fashion styles carry a higher risk than incremental innovations such as seen in fashion basics (e.g. basic five-pocket jeans, T-shirt). Radical innovation or fashion style is essentially an invention of a new product, while incremental innovation or fashion basic is an improvement of an existing product. Fashion styles generally have shorter life spans, whereas fashion basics have a longer life cycle because of their classic styling.

In this customer-driven society, it is critical for fashion designers to understand what lies within the consumers' mind. However, according to Keiser and Garner (2003), many consumers felt that product developers including designers did not understand their preferences. Sixty-three percent indicated that clothing manufacturers did not understand what they were looking for, sixty percent expressed that they had difficulty finding styles that they really liked, fifty-six percent found today's fashion offerings were boring and fifty-one percent indicated that manufacturers did not make clothes for real bodies (Keiser and Garner, 2003, pp.29). These statistics indicate that many designers do not really understand what

their customers want. As a result, they fail to offer a product to best fit their customer's needs and expectations.

If a fashion company wants to succeed in the competitive global arena, they have to invest more heavily in R&D. Market and consumer research play an important role on product design. Research findings and data can enable designers to create a more desirable product to their customers. Understanding consumer's needs and wants is a key factor in new product success (Andersen, 1983). In addition, good and innovative design can influence consumers' choice and behaviour. People may change or adjust their behaviour in order to engage new design features, new functionality and new experiences.

Fashion Industry and Design Process

Canadian Fashion Industry

The Canadian fashion industry has been facing fierce competition over the last two decades. Due to the globalization and liberalization of trade, the impact of World Trade Organization (WTO) and the rising of Canadian dollar, Canadian apparel and textile manufacturers lost their advantages and competitiveness against their global counterparts. Canadian exports to the United States have fallen by more than half a billion dollars, from $3.7 billion in 2004 to $3.1 billion in 2005 (McNeill, 2005). Many Canadian manufacturers closed their local operations in favour of offshore production for cost savings. For example, Gemini Fashions closed its domestic garment production operation in April 2003, Western Glove Works closed one of its three Winnipeg plants, and Nygard International contracts out apparel production to Asian countries such as Sri Lanka and China (McNeill, 2005). In the first four months of 2003, imports from least developed countries (LDCs) grew by more than 66 percent, and imports from China increased by 20 percent. According to Statistics Canada (2004), the import of womens/girls cotton trousers, overalls, and shorts (# HS 620462) increased from $44.3 millions in 1999 to $80.8 millions in 2003. Therefore, fashion companies should concentrate on design and product rather than patronizing "made in Canada". As quoted from Eros Scattolini, international public relations executive of Geox (Italian footwear company),

> "From our point of view, it doesn't matter where you produce, but how you do it. Outsourcing is a must, not a choice. You have to go aboard in those low labor cost countries if you want to keep a fair price, and I would add, if you want to survive. Outsourcing to cheaper locations does not challenge the integrity of the company itself, which keeps all logistics, design, marketing and financial departments in Italy, the brain and soul is Italians, the body is foreign."

In fact, not only the manufacturing sectors have been suffered from the liberalization of trade, the Canadian retailers also facing many challenges. Over the last ten years, many American and European retailers such as Zara, Hennes and Mauritz (H&M), Abercrombie and Fitch, and American Eagle Outfitters have been expanding their business to Canada. It becomes more and more difficult for Canadian fashion companies to survive and compete with those international retailers. According to Tang and Wang (2001), Canadian fashion companies are facing with the following four challenges:

(1) Easy substitution of products,
(2) Constant threat of the arrival of new competitors,
(3) Constant threat of the arrival of competing products, and
(4) Quick obsolescence of products

In order to sustain their competitiveness, fashion companies should understand their customer's aspirations, offer relevant and innovative product, and connect with their customers through various means such as innovative design, branding and advertising.

Design and Product Development

The formulation of idea and design concept is a significant step for product design. Creativity and design activities always involve identifying and resolution problems. According to Bruce and Cooper (2000), at least eighty per cent of the costs are determined at the front end of the process. Therefore, designers must consider the following fundamental values and functions of a product during the conceptual stage.

1. Solve current problems
2. Prevent potential problems

3. Resolve product-related conflicts
4. Maintain and/or improve the quality of a product
5. Provide innovative and aesthetic values to the consumer
6. Incorporate sensory values in the product
7. Offer a relevant and resonant product

Creativity and design activities always involve identifying problem and solving problem. With this respect, a number of questions related to the design process and consumers were raised and investigated in this paper. Questions such as: How can a fashion designer understand their consumer's needs and wants? What research and design (R&D) method should be used to deal with the rapid changing market demand and taste? What determine the success and failure of R&D? What design elements and aspects a fashion designer should consider during the product development process?

Based on our research, the design and product development process of a fashion company can be divided into three stages with eight sequential units (Figure 3), which is similar as Kotler and Rath's new product development process.

(1) Pre-development Stage
- Market research and analysis

(2) Design Development Stage
- Formation of idea, design concept (e.g. style, materials, theme), colour palette
- Formation of merchandising mix
- Development of fabrics, trimmings, and ideation sketches
- Selection of style and fabric

(3)Product Development Stage
- Development of technical sketches
- Prototype development/production
- Selection of prototype samples

Methodology

This pilot research project was guided by adopting qualitative techniques and methods (Strauss and Corbin, 1998; Ghauri and Gronhaug, 2002) to explore and validate the concepts and approaches for developing and constructing a conceptual model of fashion design and the interrelationships between designer, product and consumer. Medium-sized fashion companies in Montreal, Quebec, Canada was selected for this research study. Observations and semi-structured interviews were conducted with fashion designers, managers and sales persons to understand design activities in their natural context. Questions for the interviews were developed from the literature review, and some of the questions were adopted and modified from Kotler

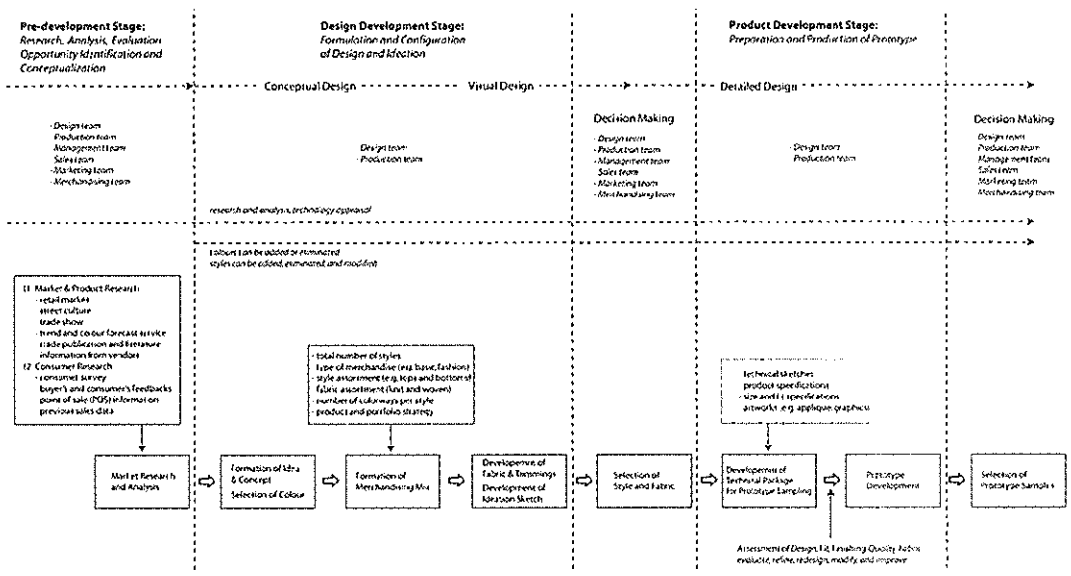


Figure 3: Model of Design and Product Development Process

and Rath's (1984) research study (Appendix I). Questions were formulated and included: general information of interviewees' role, conceptual processes, the design process, market research and analysis. Each interview lasted approximately from thirty minutes to two hours. Field notes were taken from both one-on-one interviews and observations. The content analysis method was used to analyze the data gathered from the interviews.

The purpose of this qualitative study is not intended to offer a statistically valid conclusion, but rather to provide an understanding of the correlation between designer, product and consumer.

Results and Findings

According to the results of our exploratory study, the following areas were identified as essential for designers to develop a successful product.

Pre-development Stage

Trend and Market Research
According to our interviews, a medium-sized fashion company in Montreal spent a substantial amount of time and money researching current styles and trends. Every season they sent designers and sales people to 'shop-the-market' in various metropolitan cities of North America and Europe. The intention was to gather information, identify the key fashion trends, explore up-coming styles, and to purchase garments for reference. 'Shop-the-market' is one of the most popular market research methods employed by most of the Canadian fashion companies. This particular company also sent relevant staff to visit different trade shows, such as Premier Vision in Paris, and the Magic Show in Las Vegas. In addition, they hired several style and colour forecast services as well as purchased fashion and trade magazines, literatures and market reports for their pre-development planning.

Consumer Research
The interviewee (design manager of the medium-sized company) expressed that there was a limited budget allocated for consumer research. Therefore, the failure of their product's designs could be related to insufficient consumer research. The designers had too little knowledge about their consumers, and did not understand their aspirations and expectations. There are at least several other reasons to explain this situation. First of all, the designers were not a retailers nor marketers; they solely designed and produced 'private label' products for a number of Canadian department stores according to the stores' specifications, so they rarely received any point-of-sales (POS) information from the retail stores. Second, they lacked the expertise to carry out a thorough consumer research study. Third, due to the financial limitations, they could not afford to hire a marketing firm to conduct commercial surveys or research. In other words, direct consumer input was limited. The information discovered in this particular finding was similar to the May-Plumblee and Little's (2006) research study.

Leadership of Design Process
In order to remain competitive, fashion companies have to reduce their product development lead-time and react quicker to the market. The leadership of senior management should be as actively involved in the pre-development process as possible, as they play an important role in overseeing and establishing product definition, design strategies, and identify market opportunities.

Communication between senior management and designers is a salient factor for a successful design chain.

Design and Product Development Stoge

Focus on Core Product
Due to limited resources, designers should focus on the core competency of the company when they develop a new product. If a product stretches too far away from their home base, it could be difficult to sustain its' core identity and competitive advantage. In 1990, Adidas extended their brand name into different product categories that included jeans, knitwear, ties and other fashion items. This extended the company far beyond their limitations. As a result, consumers became confused as to what exactly Adidas stood for and the brand's core market began to erode (Hang and Lutterbach, 2003). As Rose Marie Bravo (Chief Executive of Burberry Group plc) said in an interview with WWD,

> "Every brand has almost a brand circumference and you always want to make sure you don't extend yourself. I

think that's important, because I don't think every brand can do every category and do it well."

The medium-sized fashion company used for this study focuses primary on casual wear, with the majority of their business based in woman's blouses and knitted apparel. While their business annual sales have increased consistently over the last five years they have chosen not to extend their product line to other categories. The design manager specified that they did not have the overall expertise nor reliable suppliers to produce different types of products. It would take a long time to develop and build a new business, and due to the limited resources, they preferred to focus on their core products and expand that business into new and untapped markets territories. In the next few years, for instance, they are planning to expand their markets into the United States.

Expand on Product Attributes

Although small-to-medium sized companies may be better off to focus on their core product type, inherent product attributes should not be disregarded. Today's consumption culture is no longer the same as preceding generations. In the past, consumers looked at fashion products primarily based function and appearance. They now view them in more intimate, sophisticated and multidimensional ways, not merely looking for utilitarian values as they shop for a consumer product. They often decide whether to purchase or reject a product on a number of intangible factors - such as psychological (Kaiser 1990) or symbolic values (Elliott and Wattanasuwan 1998). In fact, fashion commodities have always been used as a symbol to convey consumers' identity (Davis 1994; Goffman 1973), status (Davis 1994), and image to the public. Therefore, designers should design a product that pushes beyond its utilitarian values and create a product that can be used as a sign or means to communicate or express ideas with one another. In order to create an effective communication tool, designer should make the sign as clear and unequivocal as possible to avoid confusion and misunderstanding among their targeted customers (Redstrom, 2006; Mono, 1997).

Aesthetic Values of Product Design

Both colour and fabric are significant elements for creating sensory pleasure and building aesthetic values of a product. The aesthetic values of a product are comprised of attractive and expressive attributes. According to the interviews, designers spent a lot of time on the attractive attributes such as designing, constructing and selecting silhouette, style, colour, pattern and fabric for a product. However, limited attentions were paid on the expressive attributes such as cultural values, symbolic meaning and personality of a product. In addition, one of the designers admitted that he did not fully understand how to create a product with psychological and emotional values. He preferred to collaborate with marketing people on designing a product with added-psychological values.

Design New Product with Exclusivity, Uniqueness and Innovation

In general, consumers are more willing to pay higher prices on a product that is exclusive, unique or innovation rather than on a basic commodity. These qualities within a product can enhance an individual's self-image, self-esteem, social status, or prestige, making them highly desirable. According to the interviewees' response, they did not sell every style to every store. They exclusively offered innovative styles to specific stores in order to create a sense of uniqueness to that item. These styles experienced an increasing demand from the consumer and were often sold at a higher premium.

Conclusions

Fashion designers should pay attention to the following areas while they design and develop a new product.

(1) Product design and usage,
(2) Sensory pleasure (e.g. attractiveness, beauty, tactile feeling)
(3) Emotional pleasure (e.g. joy, excitement, fun)
(4) Psychological benefits (e.g. self esteem, social status)

A successful fashion product must consist of the aforementioned benefits and values. Most of the consumers evaluate or consume fashion products basing on those components such as fit, comfort, style, fun and pleasure. Thus, fashion designers should consider and incorporate those elements during the ideation and prototype process. For example, designer may create a new dress with fun by using appealing and sensational design elements, innovative style with unique or unusual design details, sensory pleasure by using advanced materials, and cultural values with certain colour and ethnical motifs.

In short, this will be an ongoing challenge for many small to medium sized fashion companies in Canada. In order to compete with the rival brands and sustain the comparative advantages, they have to look beyond function.

Implications and Limitations

In order to offer a product that appeal to the consumers, it is critically important for fashion designers to gain a better understanding of their customer's needs and aspirations. As such, this paper is attempted to offer recommendations and insights for fashion designers and marketers, and to suggest a conceptual model of interrelationships between designer, product and consumer for today's fashion companies.

There are a couple of limitations to this study. First, the results based on only one medium-sized fashion company – thus the findings may skew towards a medium-sized company culture. This may not represent the Canadian fashion industry as a whole. Second, the sample size was small. Therefore, the validity of this study may be less significant. Further studies should be conducted in different industry other than fashion is recommended to strengthen the external validity.

Appendix I

1. What role does the designers play in a fashion company?
2. What types of research and design (R&D) method have been used? Are they effective?
3. Are designers held accountable for their work through post-evaluation measurement and feedbacks?
4. How long is the existing design and product development cycle time?
5. Are you satisfied with the interface between designers, management team, production team and suppliers?
6. What are the strengths and weaknesses of the current design system?
7. How many seasons and deliveries do you produce per year?
8. What are the current challenges and problems in developing a new collection?
9. To what extent is fashion design concept utilized in product development process?
10. To what extent is consumer research utilized in product design process?
11. What orientation does the designer and product development staffs follow? Examples of orientation: aesthetic ideals without any compromise to the consumer's needs and preferences, with some modifications of product according to consumer's needs and wants, consumer's needs and preferences are essential.
12. Does the design and product development team has adequate budget to carry out market, product and consumer research?
13. Does the design and product development team has adequate knowledge and experience to carry out market, product, and consumer research, analyze findings and information, planning, coordinating and implementation?

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A FOOTWEAR DESIGN PROJECT AS A DESIGN DISCOURSE

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Abstract

The aim of this paper is to describe and analyze the way which students are introduced to the design practice process through the university-industry collaboration footwear design project. Students in the early stage of degree programs are inexperienced on design practice and may feel vulnerable. Therefore it is essential to encourage openness of the ideas and communication. 66 industrial product design students of Istanbul Technical University designed footwear for the year 2056 in the first stage of the project, and in the second stage students updated and adapted their designs for the production phase. The project is focused on the significance of the design process rather than the final project. In order to concretize this rather difficult issue for students, multidisciplinary methods were planned, developed and used by the project staff. Final designs were produced by the collaborating footwear SMEs.

Key words: "Footwear" in design discourse, scenario writing, creativity, university-industry collaboration, SMEs.

Introduction

The footwear design project was carried out by 46 students of the Product Design 4 course and 20 students of Fashion Accessories Design Course, in 2006 spring term, at the department of Industrial Product Design in Istanbul Technical University. The project is large scale university-industry collaboration. The collaborators are Istanbul Technical University Industrial Design Department (İ.T.Ü. - EUTB), Turkish Footwear Industry Sector Research, Development and Education Foundation (TASEV), Footwear Industrialists Association of Turkey (TASD), Association of Turkish Footwear Components Manufacturers (AYSAD) and the Small and Medium Size Enterprises (SME) that has manufactured the projects. Istanbul Chamber of Commerce (İTO) has supported this collaboration project. The project was coordinated by I.T.U. academic staff and led by Assoc. Prof. Dr. Seçil Şatır. Students have researched the related topics of the given brief, generated concepts, written scenarios of the future lifestyles and designed footwear in the light of the outcome. The shoes were produced by the collaborative SMEs after they had been adapted to the year 2006 by the students.

Conformity to the Themes of the Congress

The paper conforms to the Design Discourse section of EAD07. If discourse is an arranged whole of indicators that

aim to interpret or define an object or a phenomenon, the project presented in this paper is one that has discourse both in terms of its application and in terms of the way that it interprets each phase in itself and transforms it into the next phase to get successful results. If we deal with discourse as a body of expressions which is made up of rules or laws related to a doctrine and which provides information about tangible or conceptual things or phenomena, we cannot talk about canonization of empirical knowledge. However, letting students make use of a few methods in concert and by transforming them to each other brings about a different dimension with the synthesis of methods.

The relation between industry and design which has been under discussion since the 19th century may not pose a problem for advanced countries in our day. The industry can produce each complicated solution generated by design, and companies may sell these products. The case is not that simple in Turkey. The original products conceived with enthusiasm by the designer cannot be put into production stage by the industry with the same eagerness. It is especially the SMEs' mentality that "the product should be different, but should not be too far away from those in the market". Therefore another discourse of this paper is to establish the educational response to the question: How can we attain the originality of a product with a different touch, which is, however, similar to those in the market and sell well? Another challenge is to put this training into practice in products manufactured for SMEs which have limited means of production. The discourse here is a process and method of looking for a balance in an application that has inconsistencies in it. The discourse is being able to attain a body of indicators which is different than a mere synthesis of methods, while making use of such synthesis in overcoming the difficulty of making design in an economy with limited means and inconsistencies.

Objective and Method

Working in collaboration with SMEs to conclude projects was perhaps challenging work for second year students. For the notion of novelty for the SMEs in Turkey circles around the understanding that "the product should have a different feature, but should not be too far away from those in the market". And this is not specific to the footwear sector only. A large percent of SMEs from all sectors share the same opinion. This experimentation is the general conclusion drawn after 5 years of collaboration with SMEs from various sectors.

The objective of the footwear design project, which has been realized with the second year students, is to introduce design to SMEs, "which make 99.6 percent of Turkish economy" (SPO, Turkish Premiership) and to revive the footwear sector, which dates back to Ahi Evran period (founder of Ahilik -literally, brotherhood, generosity-), an organized brotherhood in Anatolia between 12th and 14th centuries related to trade guilds that protect craftsmen, and help footwear sector attain an international level (Anonymous, 2004). These two objectives of university-industry collaboration made it possible for undergraduates to have a closer outlook of the industry and also led to another yet equivalent objective. This third objective was to help improve the creativity of second year students with various techniques.

One method of this study is empirical research. In the empirical part of the study 66 undergraduate students were assigned to work in footwear production in close collaboration with 33 companies to breathe an air of professionalism. With a two-dimensionally written scenario of the subject, human lives 50 years ahead of our time were portrayed. And together with a three-dimensional scenario the students were made to relive their childhood. The scenario, which differs from "fiction" by its division of the subject into scenes and not into plots, is a method of analysis.

Scenario writing and role-play as a method of analysis is an internationally known and applied method.

Scenario Writing and Role Play Methods

"There are many ways of co-teaching design. One of them is role-play. The concept of role play is not new; scholars did not find agreement on the definition of the terms. Such words as *role play, simulation, drama*, and *game* are sometimes used interchangeably, but, in fact, they illustrate different notions. Some scholars believe that the difference between *role play* and *simulation* is in the authenticity of the roles taken by students." says Kodotchigova (2001). The existence of little nuances in role types in this excerpt which underpins the importance of

role-play learning makes us think that playing a role which is tailored for the training of creativity should be different.

People learn from their experience. If real life experience is not feasible, or dangerous, or too expensive, then simulated experience is a substitute. Much of education makes use of simulated experience, in architecture schools, for example the process of designing projects in design studios simulates within carefully set constraints the process of designing real buildings in practice. Most simulation in education though is concerned with interactions between players in defined roles (Radford and Stevens, 1984). Role playing method creates high motivation among students.

The scenario technique has become established in design practice and has consistently proven its worth as a reliable instrument. The scenario technique was developed with approaches of Hermann Kahn in the 1960s. Scenario as a prognostic means was defined as developer's tool by the Japanese Michio Kaku for the products of the future generation of computers, biotechnology and medicinal technology. A striking example of scenario technique, which has become a useful tool for the application of design, was employed at Daimler Chrysler A.G. Under the direction of Eckard P. Minx, Daimler Chrysler AG, for instance, retains an interdisciplinary study group divided between Berlin, Cape Town, Palo Alto, and Tokyo. The participating scholars were trained as both disciplinary specialists and interdisciplinary team partners. For Daimler Chrysler and other clients they pursued questions like the following:

- How will people live in the future?
- Which products will be needed for the future lifestyles?
- How and where will these be produced?
- How will the sale of these products be changed (by new technologies)?" (Bürdek , 2005).

Following the questions about the future lives and needs of people, and about how and where the products would be manufactured in the future, starting from the 1960s other scenario writing and role-play studies were made for digital media. In the 1990s, the Philips Corporate Design Center in Eindhoven and the Domus Academy in Milan conducted a broad-based study on the future of digital media, which vividly formulated scenarios and visualized them using design concepts. The study was important for the company's internal dialog regarding questions of future product development (Bürdek, 2005).

Customized Scenario Writing and Its Objective

While the project work in a semester develops thoughts on human life in 2056 and stages them two dimensionally on sections, it brings about a scenario which is both different from and close to fictionalization. For these scenes may form their fictions in the minds of the students. Scenario writing is employed at an international level in the field of industrial products to understand end user behaviors and impressions. Design students or professional designers may analyze end user behaviors through scenario writing. An example to this may be writing a scenario from the analyses of ironing actions or playing the part of an ironing person while designing irons.

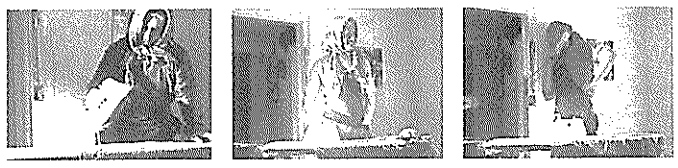


Figure 1. Ironing scenario and role play video filming in daily life. (Boom, Tejedor, 2000: 155)

The scenario and role-plays realized in this project did not include scenes that show the use of designed product, but staged childhood memories and games from decades ago. The roles here were the lives of people in retrospection and were used to bring about unconditioned creative ideas of the students. The roles here were similar to the game-like creativity tasks the executive officers from different companies undertake in international creativity seminars. However, the applications in a seminar take a short time, and so the scenario only functions as an introduction. A three-day seminar was held in April 1999 in Istanbul, which included experts of international recognition on creativity such as 'Min Basadur', 'Frank Prince', 'Robert Alan Black', 'Andre de Zanger', Hedria Lunken', R.Paul McMillen', Maggie Dugan', and 'Greg Wolff' (Anonymous, 1999). The seminar, which introduced creativity to executives from different companies, had aimed to take the executives, who back to the past, to their childhood. Taking

the students back to their childhood is a similar process, but has some differences:

- The first difference is that the process took a whole semester, and developed during the project.
- Secondly, childhood games were staged by a drama artist and director and the synopses were not written by the students but were shaped spontaneously during acting.
- Thirdly, performing again every week, the students staged the scene each time a little different from the immediately previous one.
- Fourthly, with possible changes in thought which may take place, more authentic projects were targeted in the concurrent projects. Although measuring the workability of this last item is quite difficult, the success of the resulting products is invaluable.

In most studies on creativity, it is important that the thought should go back to childhood.

Among the many answers to the question, "How could we be more creative?" Trevor Bentley (1999) in his book *Creativity* suggests reviving the scenes from the past, "getting naughty, and letting out the kid in us". Rollo May (1991) defines the finding of the creative idea as a kind of encounter. "Encounter may or may not include will power. For instance, game of a healthy kid has the basic features of an encounter and we know that this game is an important prototype of adult creativity. The main point here is not the existence of will power, but the extent of preoccupation". The scenario in this scope filmed naughty vivacious children preoccupied with their street games in a theatre stage. Taking the students to their childhood aimed at erasing their conditioned thoughts and polishing their imagination and had nothing to do with testing end user behaviors. Therefore, they were different from other scenarios in product design or from playing the parts of end users. Dividing children's games to scenes with scenarios and role-playing them is a method all by itself.

The Status of Turkish Footwear Sector and Design Needs

The education problem, which is experienced in every sector in Turkey, is one of the most important problems of the footwear sector. "The occupation of shoemaking is still taught through master-apprentice relationship, since the schools that give training are new and not enough in number"(Zirek and Özcömert, 2003). Although there are schools that give training on footwear in diverse areas of Anatolia, they are not in a position to be compared with their counterparts abroad in terms of both technical infrastructure and staff. It is seen that the school in Zeytinburnu, İstanbul is in the same condition. The sector has for a long time employed students from these schools as cheap labor (Tuncer, 2003). Although Turkey has many advantages in the production and exporting of footwear, only a small amount of production is exported. One of the major causes of this is the problem in training. The difference brought about by education can be seen in the fact that Portugal and Spain, as current rivals of Turkish footwear sector, had factory-like footwear schools even 30 years ago. Untrained labor that obstructs productivity is also the main reason of the problems in the sector in marketing, management, and design. The sector lacks the culture and vision provided by training. The most positive point in terms of training is that the sector is aware of this problem.

The other major deficiency of Turkish Industry of Footwear is design. Again, deficiency in education was suggested as the main reason of the problem in design (Ülkümen, 2003).

In the scope of Industry Congress, which was held in December 2003, it was stressed that Turkey was at a fork in the road and that the main objective of our industry should be to increase added value in the production chain and thus increase profits. "The most significant means to increase added value are innovativeness and creating difference. We should research not only the current needs of our customers, but also their future needs and design products accordingly. In this scope, we should focus on industrial product design which adds value to, and differentiates products, serves as a basis to become a brand, and has positive impact on production costs" (Küçük, 2003).

In a survey among exporting footwear companies organized by İstanbul Chamber of Commerce, officials of the firms expressed that brand was an important investment which promoted the product, and that it was an important value that reinforces the image. Although the sector may seem to have understood the importance of becoming a brand, there have never been great investments about this issue, and brandization never took place. Recently a few companies

exert efforts on the issue, but these efforts are insufficient (İTO, 2003), because these companies suppose that the creation of brand is possible only through advertising.

Today the advancement of Turkish Footwear Sector depends on their ability to increase their exports through production of value added products. Therefore design and brandization efforts should be supported, the key point of which is training. What is more, it is important that trained youths, especially designers, should be encouraged to join the footwear sector.

Experimental Footwear Design Project and the Concept of "2056"
Analysis of the Subject

Footwear design projects have been carried out three times within the context of Fashion Accessories Design course in previous years at ITU-EUTB and it's been observed that industrial design students have an intense interest in the subject. Footwear is an essential part of human clothing which is also used as a fashion accessory. With the developing manufacturing techniques footwear has evolved from a craft object to an industrial product. And today footwear design takes an important place in the industrial design world. Having approximately 2 billion dollars trade volume and 400 thousand employments (Ülkümen, 2003). Turkish Footwear industry is offering broad work opportunities for industrial designers and design graduates.

This can be useful correspondingly. While product designers are contributing to the development of Turkish footwear design, developing footwear industry can offer more possibilities for designers. Thus footwear design needs to take its place in industrial design discipline in Turkey.

From the design education point of view, students in the early stage of design programs are inexperienced in design practice and may feel vulnerable. Therefore it is essential to encourage openness, to teach the concepts of design originality, innovation and creativity and to make applications. Looking from this perspective the product "footwear" as a subject has been chosen purposely because it is thought that stylistic design phase of footwear design can enhance creativity. In addition to that, project theme has been given as "The Footwear of the year 2056". The students had to propose ideas and designs for future life styles, clothing and shoes. This enabled students to think widely, find alternative solutions to the problems, leave the stereotypes and think in a futuristic way. Therefore the subject was dealt with a pedagogical approach to design education.

Another reason for choosing footwear is that it is assumed that people use all kinds of shoes every day. Footwear is an essential part of people's daily lives which can be analyzed physiologically and psychologically by students themselves. It is supposed that students will design something that is considered as a part of their body. Therefore they could work more consciously, eagerly and be more productive in idea generation.

Collaborating with footwear sector associations allowed the students to build the prototypes of their final designs. The transition from two-dimensional design to the three-dimensional product is one of the most challenging phases of design practice process in design education. Engaging every student with footwear SME has obtained an important experience both for the students and for the project staff.

Design Process and Concept Generation Phase for the Year 2056

As mentioned before, the theme of the project was "The Footwear of the year 2056". The project has been divided into three stages. The first stage was announced as the research phase. Students were separated into groups of the following research topics; history, production techniques and materials, foot anatomy, physiology and health, footwear trends. After researching their topics, students presented their findings. The visual presentations helped students to collect visual material for inspiration in their design process. The group activity while researching and presenting has also supported the idea sharing and generation.

In the first stage, it was aimed to find creative ideas and give innovative design decisions without taking production possibilities and market expectations into consideration. Before engaging with the SMEs' boundaries it was important to design shoes in an eternal freedom environment, in 2056.



Figure 2. 2nd year student Deniz Uyanıker's concept sketch.

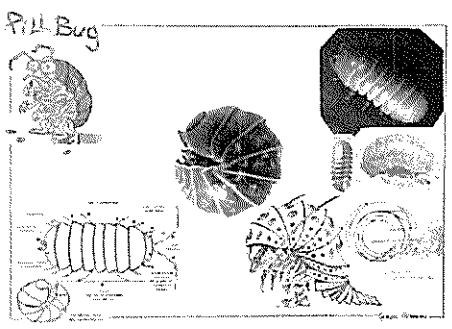


Figure 3. 2nd year student Gökçen Hotoman 's concept sketch.

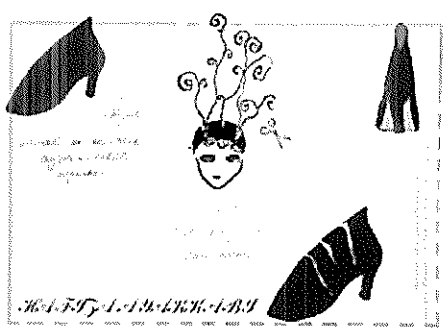


Figure 4. 4th year student Merve Tuna's concept sketch.

The Process of Retrospective Scenario Writing

At the methodological dimension, the latest findings from researches suggest the combinative use of different methodologies developed in different disciplines. Scenario writing is a common method in design process for idea generation phase. In this stage students were asked to write future lifestyle scenarios considering the foot and footwear.

Based on these scenarios of the year 2056 concept boards were formed. Story boards and concept boards showed that students have different concerns for future and future living environment. Most common concepts were gaining positive energy, escaping from the stresses of the everyday lives, recycling processes of materials, multiplying usability of products, organic design, technological inventions, and innovations.

The most important phase of this stage was *theatricalization*. A drama artist from "İstanbul Şehir Tiyatrosu", Bora Seçkin, has collaborated with the project academic staff. He has gathered with students once a week, discussed their future scenarios and led brainstorming sessions for scenario writing. The aim of the *theatricalization phase* was creating a performance in which each student would be a performer. Thus students have played the roles of identities created by them. They have entered into future worlds which were designed by them. One of the students' concepts was applied for the final performance. It was "returning to childhood, playing childhood games". Bora Seçkin has directed the play. All students wore white cotton dresses and colorful socks on their feet. Students playing games with each other in a complete white scene emphasized the pure child creativity. And colorful socks were the objects of design to create. At the final exhibition of the project, the recorded performance was presented. Although some students found this stage embarrassing, it resulted in students developing a new way of thinking.



Figure 5. Scenario writing and role play pictures: coming to play arena and playing children games.



Figure 6. Playing childhood games in the play arena.

Transforming 2056 Footwear Concepts into the Year 2006 and Collaborating with SMEs

The last stage of the process was the most challenging part for students. After an intense creative and imaginative stage, all of a sudden they had to land to the real world and transform their concepts into the year 2006. Besides the design process difficulties, it was the first time they were engaging with real producers. Three weeks time was given for the transformation and adaptation. The shoes had to be wearable, appropriate for human foot anatomy, trendy in market, suitable for mass production and always innovative. Many 2D sketches and 3D models were made in this stage of the design process.

A meeting for matching the SMEs with students was organized by TASD, AYSAD and TASEV at the İTO building. Students presented the works that they had done so far. Firm owners or directors have chosen the projects suitable for their market segments or production capacities. 33 SMEs were paired with 66 students. Meeting environment was like a design bazaar.

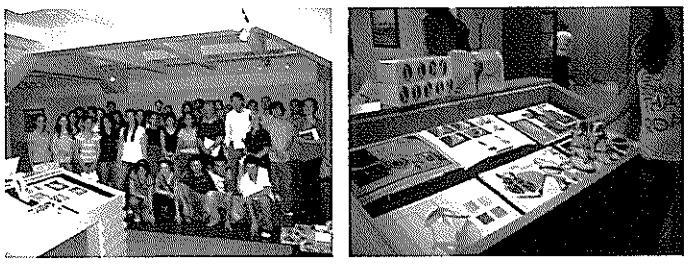


Figure 7. Exhibition of the projects at the İTO Chamber of Commerce building: presentation for the SMEs.

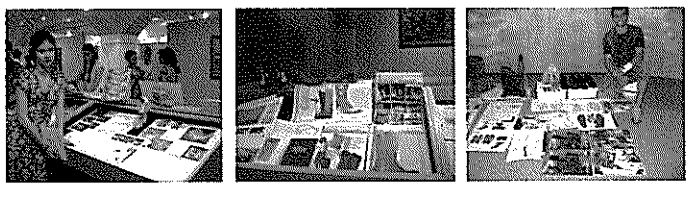


Figure 8. Exhibition of the projects at the İTO Chamber of Commerce building: design bazaar.

Students have experienced an intense design practice process within the manufacturing plants of their firms. Most of the collaborating SMEs did not have a design experience therefore it was also a challenging from their point of view. But the sector is aware of the importance of the design factor in creating competitiveness. They were eager to work with designers so the results were satisfying both for the SMEs and the project staff. The results of the project were exhibited in the 35th AYMOD (Footwear Fashion) Fair on 8-11 June 2006.

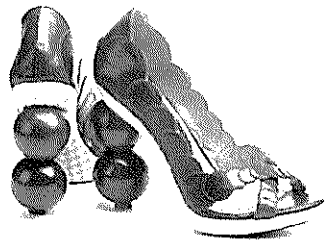


Figure 9. 2nd year student Ceylan Uşakiereli's final prototype.



Figure 10. 2nd year student Deniz Uyanıker's final prototype.



Figure 11. 2nd year student Gökçen Hotoman's final prototype.

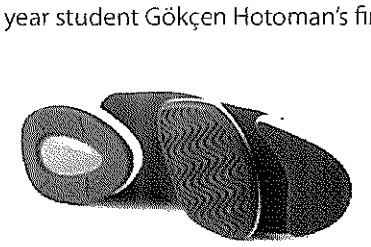


Figure 12. 2nd year student Mustafa Özkeçeci's final prototype.



Figure 13. Exhibition poster of the project.

Analyses of Project Work

• Footwear project work has been useful in the development of university-industry collaboration. It was also a good opportunity for students to learn about the production techniques and processes of the firms, and to swap ideas with their executives and workers.

• The collaboration of several institutions such as İTÜ, İTO, TASD, AYSAD, TASEV prepared an unprecedented project medium and made it possible to get rid of shortcomings. This project is important for the development of the sector and design in that it is the harbinger of other future connections between footwear sector and industrial product designers.

• The idea of product design brought a different viewpoint to fashion design and fashion accessories. In the footwear design process not only the fashion and trends but also the technical innovations and contemporary features were taken into consideration and the conceptions of a future which is 50 years ahead of our time were transferred to the contemporary. The idea of product design added value to the development of fashion.

• It was seen that product designers would not suffer from unemployment in Turkey if they broaden their fields of work. More importantly, with the initiatives of footwear sector associations, it was resolved that a footwear school should be opened. Although there are vocational schools on footwear, even one of which was founded with funds from European Union, it is a pity that there is no higher school where the graduates could continue their training. The studies in this matter continue.

• Designing footwear, which the students use in their daily lives, made it easier for students to make use of their own experiences about and expectations from footwear and made it a more entertaining subject for the students.

• The students saw the production process of footwear and knew it beforehand and this led to better understanding of the transformations in the design process.

• Some footwear prototypes differed from their 2D design presentations. This was because the production facilities or shoe lasts in some SMEs could not adapt to the innovation. In this case design work adjusted itself to the means of the enterprise and helped their transformation.

• It was quite difficult at first to make all the students, who have unique characters of their own, accept the importance of scenario writing and role-playing their childhood. But throughout the semester the rate of acceptance increased. As students felt themselves as part of the event, they showed more of their unconditioned thoughts and feelings.

• Evaluative studies were made with students in which they tried to recognize the distinguishing features of their own interesting ideas among the many alternatives they acted out.

• After the production and exhibition of footwear designed by 66 undergraduate students from Industrial Product Design Department, ITU, there has been a change in the opinions of the academic staff at Footwear Training Institute and of the companies that participated in the ITU-EUTB collaboration. They witnessed the importance of design and saw the difference brought about by designers and they expressed their need for designers.

• Employment of different techniques together and a multidisciplinary approach to design training process assumed a dynamic dimension which had a positive impact on the

results. Students inquired about, and were able to analyze the lifestyles 50 years ahead of our time.

• Turkish industry and SMEs were shown the role of design in different areas and that design may earn them different viewpoints.

• The field of design which requires having to take into consideration functionality, fashion, developments of the time, new technologies, ergonomics, innovation, market share of the company, competition, etc. plays an important role not only in footwear but also in other sectors. This role is a plus value for each of these sectors. The production sectors in Turkey should be taught about this role by model projects. This collaborative work is therefore invaluable.

• Another plus of the collaboration with industry in design education is that the production methods of SMEs can be seen on site, and the ability to design products according to their market share and customer expectations.

CONCLUSION

General evaluation

There was not much difference between the training staff and production companies in the evaluation of the design work. However, in general companies wanted the designs to be shown in the recent exhibition and they also wanted products which target their current market and which are readily sellable. For the designs were really innovative which the companies thought would sell well. The project was useful in raising an awareness of the occupation, Industrial Product Designer, among Footwear manufacturers and gradually among other industrial corporations.

Educational evaluation

Our students who are doing industrial product design showed that an approach to footwear design that is different from a fashion designer's is possible. While fashion designers are influenced by trends, industrial product designers are aware of technical innovations and developments of the time, in addition to fashion and trends. This shows that innovation does not only lie in trends, but could be created in various ways. Making use of research, scenario writing, and role play in design, and being a university-industry project; the footwear design project has been an edifying process because it embodied many different methods and features.

After the project which was realized in Spring Semester 2006, 3 participant students continue their work with footwear manufacturer companies. This may be counted as another benefit of the project due to its collaborative nature.

The project, together with its process, is also useful in that it is a model project for the future industry-university collaborations.

Evaluation from the students' point of view

The project has been an edifying one, for it allowed the students to see production, marketing, company relations, competitive medium, and the product's ability to meet company's expectations, all on site. The realization of their designs, and their exhibition in two large trade fairs in Istanbul increased their self-confidence.

The project led the students to ask "What are the differences in the creative priorities in the viewpoints of fashion designers and industrial product designers?" and showed the fact that different viewpoints resulted in quite different products.

Evaluation from the companies' point of view

For TASD, AYSAD and TASEV, it is a corporate success that their members participated in such collaboration and received favorable results. It has been a satisfactory and successful collaboration for membership enterprises. Taking into consideration the fact that footwear manufacturer associations organized footwear design contests in the past and the resulting products reflected the trends of day, the difference with the product design viewpoint can be better seen in resulting footwear designs upon conscious and customized design training. It was this difference that excited footwear manufacturer associations. A difference in viewpoint with a readiness to familiarize itself with all kinds of objects, which is open to new techniques and technologies, and which questioned and analyzed future lifestyles!

ITU Pavilion at AYMOD Exhibition and Award Ceremony

Industrial Product Design Department, ITU participated in AYMOD (Footwear Fashion Fair) that was organized in CNR Expo Exhibition Center, Yeşilköy on 8-11 June 2006 with undergraduate student projects which were realized in collaboration with Istanbul Chamber of Commerce, TASD, AYSAD, and TASEV. The exhibiton was opened by Kürşat Tüzmen, State Minister. Then the minister presented the prizes to students who came first, second and third from among 66 footwear designs by ITU students. Gökçen Hotaman was the first, Deniz Uyanıker and Uğur Keşan took the second place, Bahar Yıldırım and Tuğba Güney was third. The jury of the contest included footwear manufacturer companies. The resulting exhibition and contest was quite a competent and motivating achievement for ITU-Industry collaboration.

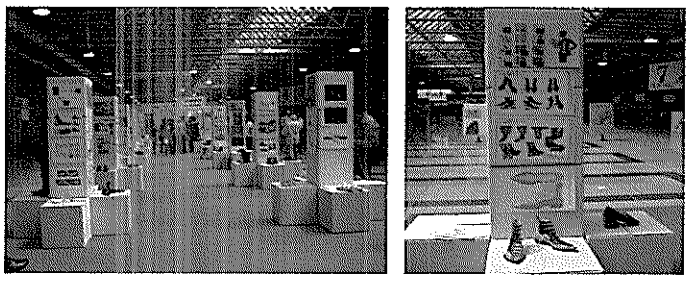


Figure 14. İ.T.Ü. – İTO –TASD – AYSAD – TASEV collaboration projects exhibition at the 35th AYMOD (Footwear Fashion) Fair at 8-11 June 2006.

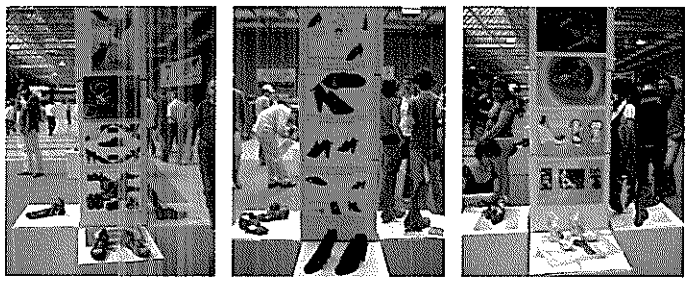


Figure 15. Exhibition at the 35th AYMOD (Footwear Fashion) Fair at 8-11 June 2006.

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DESIGNER'S METIS

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Abstract

The task of designer seems to be unethical by many because of the effects it does within the complex network of relations it has with production and consumption, and thus with economy, ecology and culture. Reviewing the literature on ethical concerns about design, there can be seen two distinct discourses, which are in a serious conflict. When the designer is considered as the manipulator of fashion, popular culture and consumption economy, i.e. as a conscript of capitalism, s/he is assumed to have the power of virtuosity on signs, and that of persuasion with his/her rhetorical skills. However, when it comes to the questions of ethics, this discourse attributing power to the designer ceases to exist, and leaves its place to the discourse of the meek. The designer, according to the latter, has nothing to do against the tendencies, mostly occurring as compulsions, of the market, and must adjust his/her compatibility with the flow of capital. This discursive shift is utmost critical; however it hardly proves the designer innocent. Some other works on design ethics mostly come up with humanistic and sometimes spiritual suggestions, ignoring the political-economical aspect determining the current position of design. The paper, detailing the analysis of these accounts, proposes 'metis' as the way to cope with designer's dilemma.

Introduction

The main question of this paper is whether industrial design can be the subject of an ethical inquiry, and if it can be so, how would it, as a discipline, which ought to reflect upon the basic principles underlying its course of action, answer the questions asked thereof.

There are many who attribute a serious responsibility, a duty of vigilance and didacticism to industrial design profession, while on the other hand, there are others who, without denying such an attribution, bring forward the issue of compulsions of the market, i.e. the rules of the universe in which design exists. While the former party idealizes the praxis, motivating it for a teleological route, the latter asks the question of freedom of industrial design. The limits of industrial design praxis are thus drawn by the skills and virtues attributed to the activity itself and by the borders of the obligations of the market.

Reviewing some examples of these discursive pieces on ethics of industrial design, I would like to refer to a serious shift in comprehension of the limits and skills attributed to the practitioners of industrial design activity, and to the subject itself. This shift reveals a conflict in conceptualization of the praxis, which results in a persistent avoidance from undertaking the responsibility and constructing an ethical-political set of principles of industrial design.

After identifying, analyzing and positioning the discursive maneuvers on ethics of industrial design from my few examples, I would like to implement a rather novel use of a borrowed perspective from De Certeau for eliminating the seemingly contradictory understanding of industrial design and its determining relationship with the surrounding agents, most importantly, the market economy which seems to be the corrosive element in terms of ethics. Here, the nature of *designerly* argumentation, i.e. rhetoric, will be the path to reconstruct an ethical statement.

Design Ethics?

If ethics will be the concern, basically, we need agents, at least one of whom performing some acts with their own will, deciding by themselves freely, another party getting effected from the

deed of the former, and a set of principles the both parties agree upon, thus the former party can be considered responsible for their actions. Then, what is the relationship between ethics and industrial design? How can we construct the above-mentioned formula in the realm of industrial design?

It is obvious that the practitioners of industrial design do perform actions such as deciding on the forms, functions, and natures of objects, the materials to be used while producing them, the ways to convey meaning through and by the properties the object has, the lifecycle the object (and its user, at least while using it – from the encounter phase to disposal) will go through. Thus, the decisions about the production and consumption of the objects are taken broadly by designers. However, there is something more than this: The decisions of users while living with, using and experiencing a product are mostly based on *designerly* decisions taken in advance. The object is designed to be used in a broadly defined (but defined, not in an absolutely indefinite) way, to cover a preplanned path, to fulfill a set of functions for the user. Moreover, there is always the possibility of misuse, abuse, or variations of usages that cannot be determined at design phase. Hence, it can be said that designer's decisive actions about the objects results in a question of responsibility in at least two layers: The first, a direct one resulting from the relationship between the designer and the object, and the second, the one between the object and the user. All the actions, their motivations and effects occurring throughout the life of an object, from production to consumption and disposal make up a giant set of probabilities in terms of ethical conduct.

The second party which is effected by the actions of the first one is composed of many agents: The nature gets effected from the phases of production, energy consumption during usage, and disposal; other people besides user gets effected by the consumption and usage of the object: There are economical, cultural and sociological parameters being influenced by the existence and experience of designed objects.

Even this simple mapping of actions makes industrial design one of the most important key determinants in the middle of a complex net of relationships, agents of which vary from production, economy, technology, marketing, advertisement, and distribution to consumption, culture, ergonomics, ecology, etc. To make a specific match, industrial design is the mediator between production and consumption, nature and body and mind of a subject, and economy and culture.

Having identified these fairly obvious agents and leaving the discussion of freedom and responsibility to further chapters, things become more difficult when it comes to the third element of ethics: Are there, or can there be any set of principles to be agreed upon by the agents in order to have the action to refer? I think, a picture of the conditions in which industrial design exists is necessary to speculate on the possibility of such principles.

Industrial design is, first of all, characterized by a dual alliance with mass production and mass consumption, the two phenomena, which determined nearly all its manifestations, within the framework of industrial capitalism, which created and continues to dominate design. Thus, design cannot be evaluated in isolation from these, but, on the contrary, the conditions in which it exists, and the results it brings about should be examined in the above stated context (Sparke, 1986: xix).

Findeli writes, strikingly and bitterly, however bluntly, about what it means to be characterized by the two phenomena, remarking that design has strongly been bounded to

> [...] the determinism of instrumental reason, and central role of the economic factor as the almost exclusive evaluation criterion; an extremely narrow philosophical anthropology which leads one to consider the user as a mere customer or, at best, as a human being framed by ergonomics and cognitive psychology; an outdated implicit epistemology of design practice and intelligence, inherited from the nineteenth century; an overemphasis upon the material product; an aesthetics based almost exclusively on material shapes and qualities; a code of ethics originating in a culture of business contracts and agreements; a cosmology restricted to the marketplace; a sense of history conditioned by the concept of material progress; and a sense of time limited to the cycles of fashion and technological innovations or obsolescence [...]
>
> (Findeli, 2001: 6)

Attributing a certain degree of truism to the above-described universe industrial design is in, I will attempt to review the ethical accounts put forward.

Many writers undoubtedly agree that the ethical dimension should be included to the discussions on industrial design as it a wide variety of effects on many aspects. The conditions of the market and its determining power on designer's conduct lead the way to an ultimate disaster in many ways. Hyper-consumption results in psychological, social, economical and ecological disequilibrium and discontent. The role of designer in these cannot be underestimated. Besides these shared observations and identifications, the proposals, however, vary. These variations may be because of positioning of and expectations from industrial design.

At the core of the discussion of industrial design ethics lay two essential issues, which are closely related. They are ecological concerns resulting from hyper-production and hyper-consumption, and the consumer culture as a sociological and economic fact.

According to Dieter Rams (1995), our product culture will force us to adopt a new design ethics in which the criteria to judge the value of design will be the contribution it makes to survival in general. Design will have to work for improvement of material ecological quality and reduction of quantity of products (Rams, 1995:35). An aesthetic, which supports long-term use and the conservation of resources, is deemed necessary to be developed. The aim is to change the structure of the way masses live with an ecological sensitivity made standard for every segment of population (Rams, 1995:36-38).

The task of design, for Rams, has an ethical dimension. He presupposes the necessity of moral values that will lead people for a sustainable future (Rams, 1995:37). The key point for our discussion here is the duty assigned to design and to designer. Both the practice in general and the practitioners are considered to be the leaders of such a moral movement that has to be run immediately. Thus, industrial design discipline should at once get conscious about what is ethically wrong with industrial design, fix a novel set of ethical principles to be implemented in the practice, and take on the pedagogical responsibility to spread "overall thoughtfulness, global consciousness, and the reduction of the technology controlled by the human race" by what can be called "[r]eal honest modern design" (Rams, 1995:38).

Ezio Manzini (1995) agrees that the disastrous results of consumer culture make designers obliged to face with the lack of ethics of design adequate to the new problematic framework and to new sensibilities. This encounter with the environmental problematic can generate a new sensuous horizon for design and can be the source of a vast series of cultural transformations and contemporary societal practices, exceeding the limits of discussions about the values industrial society, which the emergence of environmental problematic imposes, and reaching to a system of consumer production more favorable to the environment, proposing new values and deeper conceptions of quality (Manzini, 1995:220).

Design should become aware of the complexity of the network of relations that the product will have with the environment in its complete life cycle (production, use, and disposal, according to Manzini, however, I would extend it to a line as production, seduction, purchase, use, disenchantment, disposal), and discover that the environmental limits cannot only refer to biosphere:

> We are in the process of discovering another type of limit: the limit of our capacity to deal with the increasing mass of information. In short, we find that our semiotic environment (that is, our semiosphere) is limited. Immersing ourselves in an uncontrolled number of signs is impossible because doing so results in a new kind of pollution: semiotic pollution, caused by confusion, loss and distortion of meaning and by the generalized production of semiotic refuse.
>
> (Manzini, 1995:222-3)

Taking one step further from where Rams arrived, Manzini includes the semiospheric responsibilities in the realm of industrial design ethics. According to Manzini, it is necessary not just to produce new images, but also to construct stable and lasting identities that can be placed in a recognizable manner in the cultural space in which we are immersed. This inevitably requires the development of a new product culture, a culture that radically questions how the existing culture fits

into our environment and how it relates to the fruitful subject (Manzini, 1995:223).

Although the analyses and assignments of the two modernists are agreeable, there is something lacking in both of their arguments: How will industrial design, and its practitioners will get free from the relations it has been bound with in the universe Findeli pessimistically sketched out, and become virtuous, really modern design/designers who will accord the course of action with the above mentioned facts, concerns and duties?

A rationalist answer comes from Wolfgang Jonas (1994). According to Jonas, design ethics should become problem specific, because, unless it does so, it is doomed to remain philosophy/theory. However, the existing ethical theories are sufficient for implementation in an ethical design practice. Design should stop pretending that the ethical basis has to be elaborated (Jonas, 1994:42-43). The only thing to do is to turn towards new ways of acting with the guidance of systems approach, from which an ethics would emerge, and then it will be no longer necessary to talk about it (1994:44). His suggestions are:

> In praxis: open, experimental, function oriented "problem design" instead of ultimate, object oriented "solution design".
> In theory: efforts towards a systems theoretic basis for continuous design theory building instead of adopting a brand-new stylish theory every decade.
> In education: process knowledge instead of factual knowledge, dialogue capability for cooperation with other future-shaping disciplines in interdisciplinary networks.
>
> (Jonas, 1994:43)

Rational and systematic definitions of problems, desirable scenarios, and the necessary interventions for development into this direction (as non-massive as possible), with the final conception of material objects with the prior goal of saving resources (sustainability) are enough, according to Jonas, to solve the ethical problem of industrial design (Jonas, 1994:47).

This idealistic, though fundamentally rationalist approach carries the modernists' argument to an extreme in which not only the principles of design are universalized, but also it is attributed to be immanent in the systems methodology, and can automatically be in charge once systems approached is implemented. Once the ethical automaton is set according to rationalistic principles of action, it would inevitably end up with purely virtuous design solutions, which are isolated from all the filth around. Neither power struggles of capitalist economy, nor cultural, economical and social inequalities can stop the rationally constructed system.

However, some think that the recent system of production and consumption is a product of a fully rationalized structure, and the last thing that is lacking is the implementation of instrumental reason. This account emphasizes the importance of the creative, the imaginative, and the spiritual side of the mind, which is weak and underrepresented, compared with the rational, instrumental side. It is argued that greater acknowledgment of this "other half" in industrial design can lead to products that are expressive of a more balanced understanding of human needs. Such a shift would not only contribute to a culturally richer material environment, it also would allow us to more effectively address the principles of sustainability (Walker, 2000:52).

Stuart Walker finds the roots of seeking fulfillment in and happiness through comfort and pursuing physical and sensory pleasures, hence those of spiraling consumerism, waste production, and environmental degradation in the dominancy of rationality over what he calls "inner dimension" (Jonas, 2000:53). He proposes an "inner development" which starts from the treatise that too many material things can distract us from inner attention (2000:54-55).

Walker finds the solution for sustainable, thus ethical design (and, production and consumption) pattern in the reduction of the quantity of materials by virtue of a mystical treatise, which diverts consumption habits away from perfectionism of industrial production:

> A shift toward appropriate concern or adequateness in the quantity of goods has the environmental benefits of reducing resource and energy use, reducing production of waste and pollution, and preserving habitats. A sense of adequateness in the qualitative characteristics

of products has various implications for design, and for more sustainable ways of living. First, "adequateness" can be considered at a products inception – the conceptual framework of a product can be examined with regard to its potential in creating conditions that allow for inner attention and development. Secondly, "adequateness" can be applied to a product's physical characteristics, that is, how the product is designed and defined. An "adequate" or "good enough" approach to product definition suggests a quite different set of priorities than we have come to expect in the fields of design and mass production. High precision, close tolerances, and perfect finishes are constantly strived for; but these are priorities of a design and production system that is, by and large, unholistic – driven by economic rationalism, severely detrimental to natural systems, and often ethically questionable.

(Walker, 2000:56)

Either rationalistic or spiritual, the ethical maneuvers proposed for industrial design necessitates an educational program in at least two layers: The first is the education of designers in such a way that both the ethical (thus, economical, political, moral, etc.) analysis of current praxis and the variety of principles developed and reconciled are taught to design students. And the second is the education of the consumer according to the same patterns.

The methodological foundations for design learning, as a core attitude of professional education, that reaches reflectiveness, responsiveness and ethical responsibility, are of three types, according to Philippe d'Anjou:

> First, it is important that the different dimensions of reasoning participate in the process of design so the students reach a comprehensive reasoning to holistically frame a design problem. Second, the students should have an anthropological model or vision for understanding the human person, the world, and the relationships "man within the world", in a non-anthropocentric holistic way, where the artefactual and professional actions take place as mediators between the user and the global environment. Finally, the students should become aware of their personal involvement and engagement at the moment of choice in the process of design through a decision-making process that integrates the ethical dimension.
>
> (d'Anjou, 2004:214)

It can obviously be seen that design ethics proposals all necessitate a fundamental change in our understanding of the object, production, consumption, market, economy, the subject, the social and political relations of the subject in the entire system in such a way that the dominant mode of comprehension and action would alter.

However, the power of market requirements drives designers into a dilemma, because the product could fail to address market demand possibly while it satisfies the social and environmental needs. Thus, both greening and social responsibility include an utmost challenging complexity and indeterminacy, whose integration into a product can be seen as a nuisance rather than an opportunity for market success (Berchicci & Bodewes, 2005:280-282).

According to Viktor and Sylvia Margolin (2002), since the Industrial Revolution, the dominant design paradigm has been one of design for the market, and alternatives have received little attention. Since *Design for the Real World* appeared, others have responded to Papanek's call and sought to develop programs of design for social need ranging from the needs of developing countries to the special needs of the aged, the poor, and the disabled. These efforts have provided evidence that an alternative to product design for the market is possible, but they have not become dominant as a new model of social practice (2002:24).

The writers remark that the aspect of social responsibility of design, which focuses on the needs of broader segments of society who are in need, has been underemphasized and state that little thought has been given to the structures, methods, and objectives of social design, and regarding the broader understanding of how design for social need might be commissioned, supported, and implemented, little has been accomplished. Nor has attention been given to changes in the education of product designers that might prepare them to design for populations in need rather than for the market alone (Margolin & Margolin, 2002:24).

The writers, without resistance, accept that the rules of the market cannot allow a full-dedication to design and production of socially responsible products and they limit the scope of research for social design with public and agency perceptions of designers, the economics of social interventions, the value of design in improving the lives of under-served populations, a taxonomy of new product typologies, the economics of manufacturing socially responsible products, and the way that such products and services are received by populations in need. Moreover, they propose the formation of a new design segment, i.e. social design, students of which will have to learn more about social needs and how they are currently addressed by helping professionals. They might do an internship with a clinical team in a psychiatric hospital, a community agency, or a residential facility for the elderly. They would also need a stronger background in sociology, psychology, and public policy. (Margolin and Margolin, 2002:29)

However, 'the society', or 'the social' which has many needs, cannot be limited to minorities such as the sick, the elderly etc. Nearly everybody is (or will be, in the near future) sick of the results of recent mode of production and consumption. The tendencies and compulsions of the market should not lead to the segmentation of the practice as above. The responsibility of designer should not be handed over to the chosen minority of designers, i.e. social designers, or eco-designers; on the contrary, in order to achieve ethical design, the responsibility should be generalized to the whole practice.

Here, after reviewing the approaches to the problem, comes the question of methodology: How can such an ethical program be implemented while modernist approaches are too utopian; rationality is charged with the current system; spirituality is not down-to-earth enough; market does not find green and responsible design suitable for its basic rules; and social design is not adequate to save the world? Moreover, it is utmost difficult to find shared values and principles to employ, and attribute the profession such autonomy.

Designer's *Metis*

Adam Richardson (1993) announces that industrial design is in a crisis of identity, purpose, responsibility, and meaning that have gone uncommented upon by the practicing community, and he proposes the questions on the viability, boundaries and the values of the profession. He also asks what the impacts of design's products in societal and cultural contexts are. His answer is somehow pessimistic as he finds it inappropriate to attribute a dominant role to designer, neither in determining the function, and thus nor in having influence on the ideological issues concerning products. Designer, according to the writer, has to dwell with the form of the product, by which s/he has to validate in the eyes of the public not only the product, but also the process and ideologies behind it, in such a way as to make them appear unquestionably natural or, conversely, by distancing, by obscuring, or distracting them. The solution of this problem partly lies in the necessity that designers have to place themselves in a position of social consciousness and responsibility (Richardson, 1993: 34-43).

Reviewing the literature on ethical concerns about design, there can be seen two distinct discourses, which are in a serious conflict. When the designer is considered as the manipulator of fashion, popular culture and consumption economy, i.e. as a conscript of capitalism, s/he is assumed to have the power of virtuosity on signs, and that of persuasion with his/her rhetorical skills. However, when it comes to the questions of ethics, this discourse attributing power to the designer ceases to exist, and leaves its place to the discourse of the meek. The designer, according to the latter, has nothing to do against the tendencies, mostly occurring as compulsions, of the market, and must adjust his/her compatibility with the flow of capital. This discursive shift is utmost critical; however it hardly proves the designer innocent.

Attribution of on the one hand a great skill, a kind of maneuverability in using signs and persuasive forms in the service of promotion of consumption, and on the other, a ready surrender to the rules of the game called market, being limited to play in the borders so that missing the necessities of ethical responsibilities, makes designer a powerful servant, a contradictory being. Industrial design, in this way, is comprehended to be weak to go beyond the limits of the current economic and political context, and it adopts a servile obedience without resistance. In design education, designer candidates are equipped with the necessary skills to survive in the market, such as creativity, innovation, adaptation to the conditions of the market, negotiation skills, etc.

However, the ethical evaluation of the results of this tendency shows that something should change in the diverse way:

> We are surrounded by products that give us an illusion of choice and encourage passivity, yet we could have so much more.
>
> [...] Industrial design's position at the heart of consumer culture, (after all, it is fuelled by the capitalist system), could be subverted for more socially beneficial ends by enriching our experiences. It could provide a unique aesthetic language that engages the viewer in ways a film might, without being utopian or prescribing how things ought to be.
>
> (Dunne, 1999: 85)

There are two serious obstacles in front of this end: The first is that the practitioners of industrial design profession do not generally tend to perform ethical self-evaluations and political positioning of the profession on the global scale. Ethics and politics seem not to be the prior sphere of interest for designers as they are focused on the production of artifacts, which will be appropriate for some other criteria than ethical and political appropriateness. The second obstacle is that even if such an evaluation becomes standard, the implementation seems to be improbable in this case.

These conditions remind Michel de Certeau's *The Practice of Everyday Life*. In this book, the writer investigates the ways in which users – commonly assumed to be passive and guided by established rules – operate; and analyze the systems of operational combination which also compose a "culture," and to bring to light the model of action characteristic of users whose status as the dominated element in society (a status that does not mean that they are either passive or docile) is concealed by the euphemistic term "consumers" (De Certeau, 1988: xi-xii).

De Certeau states that consumers of a certain cultural system are not merely destined to dwell in the strictly fixed borders of that culture, but they become alternative producers of that culture. According to the writer, consumption is a way of another production, which corresponds to a rationalized and at the same time centralized, clamorous, and spectacular production. Consumption is devious, it is dispersed, but it insinuates itself everywhere, silently and almost invisibly, because it does not manifest itself through its own products, but rather through its ways of using the products imposed by a dominant economic order. Apart from the way a cultural system is designed, it is important how the users make use of it. The users, De Certeau states, make innumerable and infinitesimal transformations of and within the dominant cultural economy in order to adapt it to their own interests and their own rules, and construct individual sentences with an established vocabulary and syntax (De Certeau, 1988:xii-xiii).

> If it is true that the grid of "discipline" is everywhere becoming clearer and more extensive, it is all the more urgent to discover how an entire society resists being reduced to it, what popular procedures (also "miniscule" and quotidian) manipulative mechanisms of discipline and conform to them only in order to evade them, and finally, what "ways of operating" form the counterpart, on the consumer's (or "dominee's"?) side, of the mute processes that organize the establishment of socio economic order.
>
> These "ways of operating" constitute the innumerable practices by means of which users reappropriate the space organized by techniques of sociocultural production.
>
> (De Certeau, 1988:xiv)

Even if the space that the consumer-producer moves about is technocratically constructed, written and functionalized, their trajectories form unforeseeable sentences, partly unreadable paths across a space. Although they are composed with the vocabularies of established languages (those of television, newspapers, supermarkets, or museum sequences) and although they remain subordinated to the prescribed syntactical forms (temporal modes of schedules, paradigmatic orders of spaces, etc.), the trajectories trace out the ruses of other interests and desires that are neither determined nor captured by the systems in which they develop (De Certeau, 1988:xiv).

De Certeau further makes a distinction between the motives of action and identifies two groups of action plans:

> I call a "strategy" the calculus of force-relationships which becomes possible when a subject of will and

power (a proprietor, an enterprise, a city, a scientific institution) can be isolated from an "environment." A strategy assumes a place that can be circumscribed as proper and thus serve as the basis for generating relations with an exterior distinct from it (competitors, adversaries, "clienteles," "targets," or "objects" of research). Political, economic, and scientific rationality has been constructed on this strategic model.

> I call a "tactic," on the other hand, a calculus which cannot count on a "proper" (a spatial or institutional localization), nor thus on a borderline distinguishing the other as a visible totality. The place of a tactic belongs to the other. A tactic insinuates itself into the other's place, fragmentarily, without taking it over in its entirety, without being able to keep it at a distance.
>
> (De Certeau, 1988:xix)

He further remarks that many everyday practices (talking, reading, moving about, shopping, cooking, etc.) are tactical in character. And so are, more generally, many "ways of operating": victories of the "weak" over the "strong" (whether the strength be that of powerful people or the violence of things or of an imposed order, etc.), clever tricks, knowing how to get away with things, "hunter's cunning," maneuvers, polymorphic simulations, joyful discoveries, poetic as well as warlike. The Greeks called these "ways of operating" *metis*.

The producer-consumer identity fixes both the designer and the consumer. The designer is obliged to consume the cultural and economic patterns of the recent system in order to survive in the market, and the consumer is obliged to consume the ways of operating that designers propose with their designs. However, there is possibility for both to implement *metis* in their actions: Tactical uses of cultural elements would result in rhetorical diversity, which transcends the compulsions of the market economy, and reach out to novel persuasive sentences, produced by the same syntax, but have a meaning in contrast with regular sentences. The same goes for the consumer: Their usage of the elements of culture (objects or meanings) may alter the meaning imposed by the systematic act of planning.

The key point here is to become open to alternative political analyses of the conditions, develop a critical self-consciousness and self-positioning, and to make use of cunning maneuvers to escape from the dominant ways of making sentences, i.e. designing and consuming. Since strategic and general solutions for the designer's dilemma (his/her power and weakness, his/her virtuosity and limitedness, his/her will and lack of freedom) seem not to be available, tactical solutions might be sought.

Conclusion

The task of designer can be considered as unethical (i.e. immoral, not correct) through many perspectives because of the effects it does within the complex network of relations it has with production and consumption, and thus with economy, ecology, and culture. However, grand proposals to change it into something ethically good are not persuasive about their practicality. Before heading for such idealistic attempts, industrial design should be posited as something *ethical*, i.e. something that is subject to ethical concern and evaluation. Thence, only after this self-reflexive moment, could a plurality of attempts to evaluate industrial design, and to seek original ways for the betterment of the so-called ethical conditions together with economical, political and cultural contexts be comprehended.

Besides the *strategic* attempts described in the first part of this paper, essentially *tactical* character of the realm of design, i.e. impossibility of uni-direction, being bound to local contexts of obligations and opportunities, etc., should not be forgotten while proposing ethical programs for industrial design. After admitting industrial design to be *ethical*, and the practice (of both the designer and the user) ending up with being indispensably *tactical*, should the designer, design student, theoretician, and educator, etc. attempt to explore the *designerly* ways to construct a feasible ethical frame which can be adopted to the present context. Before saving the world, a session of self-reflection and a little modest exercise can be beneficial.

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FROM THE UNIVERSAL TO THE PARTICULAR: EMOTIONAL RESPONSES TO PATTERN

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Abstract

Human beings, it seems, are "pattern searchers", (Kraft, 2004 p. 276), constantly seeking the order and harmony that pattern provides and using 'it' to make sense of the world.

This paper will outline a recent pilot study that explored how we perceive surface patterns (ranging from ordered to disordered) in both a static and dynamic state and their impact on our senses. Specifically how pattern transforms sensory impulses through visual perception into emotional responses (the psychophysical).

Visual perception theories discussed at the start of the 20th century by the Gestalt psychology movement (a movement in experimental psychology) are still relevant today. Gestaltists believe that when we see, we perceive our environment as organised patterns and forms rather than unorganised smaller parts and that our brain interprets our view by grouping elements together in order to make sense of them. These grouping theories of proximity, similarity, closure and simplicity have made an enormous contribution to our understanding of visual perception as they explain the relevance of groups to visual harmony.

Throughout our lives we are constantly exposed to pattern, but our awareness and therefore our responses to it varies from a conscious to subconscious level. Some patterns have the ability to grab our attention and make us take notice while others do not. This pilot study is based on the theories of psychologist David Canter who explains how we respond to visual information in the form of pattern in what he calls our 'arousal curve'. He argues that responses to pattern form a bell curve from non-engaging to over stimulating. This is significant as we look at the various functions of surface pattern, namely camouflage, to disguise or blend in; contrast to stand out, appear strong or confident, and decoration and ornamentation to attract, give pleasure or aesthetic satisfaction.

There is a tendency in commercial pattern design to remain within the 'comfort zone' and this constant exposure to one area on the arousal curve may be having a numbing effect on our senses causing pattern to become almost meaningless in an emotional context and lack value in itself.

This pilot study identifies ways in which we can explore all areas on the arousal curve and examine what types of patterns are associated with disinterest or boredom, excitement, fear and overload. The emotional consequences of static and dynamic patterns and their potential uses will also be explored.

Introduction

Surface pattern describes something that is a visual phenomenon. It refers to a plane comprising of shapes, lines, symbols and colours usually organised with repeating elements and some kind of order or symmetry. However, the 'plane' can change from static to dynamic depending on the situation it is in and the same pattern may potentially provoke a different emotional response from the viewer depending on its use.[1]

Surface pattern in its commercial sense is normally associated with fashion; it is decorative and therefore ornamental. So when Adolf Loos declared 'Ornament and Crime' in 1910, western

[1] use – refers to how the surface pattern is used, its scale, its moving state or the material it is applied to.

culture began to witness a rapid decline in the status, function and usage of decorative surface pattern and arguably the decline in our cultural capabilities to create, read and understand the language of ornament as a design aesthetic (Trilling, 2001). But reading and understanding visual pattern language may move beyond the parameters of aesthetics (as Gestalt psychologists suggest) and touch on something much more innate within us making surface pattern a potentially powerful tool with more than one function (currently decoration).

This paper will discuss some of the theories of pattern and pattern perception in relation to surface design. It will outline an initial pilot study and a further proposed study that seeks to determine the effect that various decorative pattern types, when presented in both a static and dynamic state, can have on our senses.

Pattern and Printed Textile Design

As a printed textile designer/maker I continuously seek to produce decorative textiles through the application of pattern and colour onto cloth. Free from the constraints of commercial markets practice is intuitive, patterns are composed for various cloth surfaces where success is measured by the harmony and pleasure experienced through viewing the final piece. The cloth itself takes the form of hangings or fashion accessories that provide a mainly decorative function; therefore they are purchased as desirable items. It is this link between pattern, intuition and desire that started a curiosity about pattern and response to it.

Pattern is used extensively in textile design and textiles are visible in every society in the world today: they are one of the most essential and significant design products of every culture as they embody both a functional role and also reflect the ethos of that culture. Textile design is an intrinsic part of society and as such textiles change and evolve within it, becoming an historical and cultural reference point. Within our own culture textiles embrace traditional and innovative design and technologies, therefore their role today exists within and beyond traditional boundaries of cloth.

National security and business investment is currently driving much of the innovation in textiles and technologies ensuring a healthy cross fertilisation of new and traditional ideas between textiles, science and engineering. Wearable technologies and interactive systems are becoming a reality, and progress within textiles for use within medical research is undergoing a revolution. The function of textiles is rapidly evolving beyond its traditional and historical contexts but the purpose of pattern seems in contrast to be part of a relatively unimportant territory associated with decoration and ornamentation. However the importance of this visual phenomenon (decorative pattern) particularly in terms of the inter-relation between maker, pattern and viewer is the focus of this paper.

Visual perception theories discussed at the start of the 20th century by the Gestalt psychology movement (a movement in experimental psychology) are relevant to this debate. 'A Gestault' notes Dannet (2004, p230) *"...is a whole, a new kind of organisation with qualities and properties of its own which neither reside in the parts or can be reduced to them "*. Gestalt theories are underpinned by the assumption that the viewer is seeking order and harmony to experience 'good gestalt' and that disorder results in a 'bad gestalt' thus provoking a negative emotional response in the viewer.

Gestalt psychologists identified the four following grouping theories as particularly relevant to visual harmony, namely *proximity* (figure 1), *similarity* (figure 2), *closure* (figure 3) and *continuity* (figure 4).

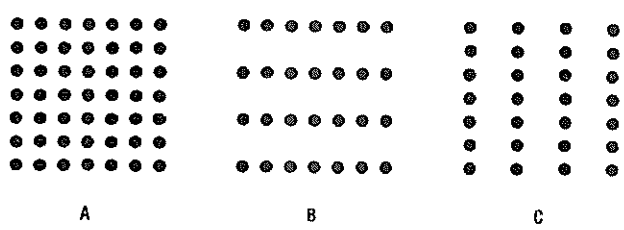
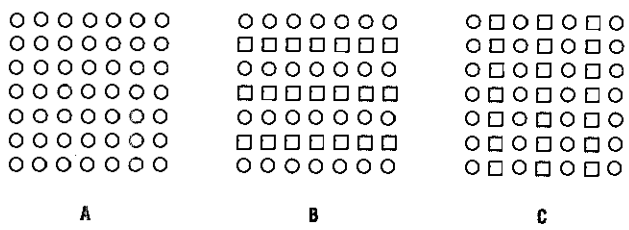


Figure 1.

The closeness of the elements in figure 1 (a, b and c), show how proximity of elements affects how we see them. We see figure 1a as a square of dots and although figure 1b and 1c are still squares of dots, we read them as horizontal and vertical lines.



A B C

Figure 2

Figure 2 shows how we group similar elements together. We see figure 2a as a square of dots and although figures 2b and c make up squares of similarly sized and weighted elements, we see them initially as horizontal and vertical lines.

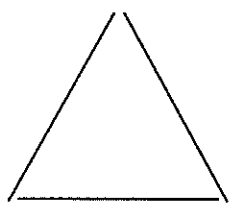


Figure 3

Figure 3 demonstrates how the closure theory affects us. We see the image as a triangle and not as three straight lines, even although there is no triangle there.

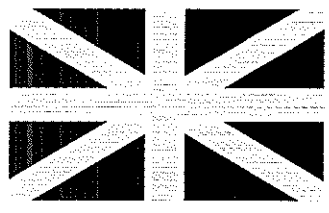


Figure 4.

When we look at the Union Jack Flag in figure 4, we see that it is dominated by the following: the cross in the foreground is obvious and is depicted as a continuous line, but we can also read the broken X clearly behind it. We do not for example see the X as a V and an inverted V.

All of the above groups are concerned with visual recognition and the arrangement of form, therefore they may be pivotal in our understanding of visual perception and pattern as they can help us understand the relevance of form organisation to visual harmony. The Gestalt grouping theories describe how the brain processes visual information so that when we see we perceive our environment as organised patterns and forms that are whole rather than unorganised smaller parts. Our brain interprets our view by grouping elements together in order to make sense of them. Gestaltists believed seeing to be an inter-relation between the viewer and the viewed. Therefore there is great importance placed on the intuitive qualities of seeing and perception itself as seeing is an emotional/subjective reading of the whole.

Therefore good Gestalt (interpreted as visual harmony in this study) within decorative pattern and surface design relies on the skill and knowledge of the maker.

Soetsu Yanagi, a Japanese craft theorist, believed that in order to make a work of great beauty (and provoke the sense of pleasure in the viewer) the maker must be able to combine "seeing and knowing". Yanagi stated that seeing came first through an intuitive response to the subject and knowing he said is the intellect, he argued that seeing is superior in that it cannot be acquired and that in order to produce a thing of beauty 'seeing' must precede 'knowing'. He said," ...*One may be able to turn intuition into knowledge but one cannot produce intuition out of knowledge*" (Yanagi, 1972 :110)

Yanagi also stated that there is a natural order of things and this became very apparent in the relationship of beauty and pattern. Nature and natural form are continually featured in ornamental pattern in the form of translation or a human interpretation of a natural view. Historically, nature is never shown as an absolute copy therefore it is the interpretation into pattern from the view that provides the viewer with the sense of beauty and the emotions that beauty entails. The artist and theorist Owen Jones, also looked at this and discussed the importance of using nature and natural form within these groups for ornamentation purposes as he believes that the viewer will instinctively prefer/like it (Jones, 1856).

Recent research by Patricia Rodemann (1999) cites Gestalt theories and Jones' theory as still relevant within the context of surface pattern. She found that designers needed to understand groupings within pattern design as they play a significant part

in the success of the design. Rodemann (who conducted her research in the USA) used an extensive archive of symbols and imagery and found that the participants preferred natural form within interior environments to all other symbolism. She concluded that surface pattern when presented in a static state in our interior environment, "*can produce a broad variety of physical, emotional, and psychological responses to those who view them, from cheerfulness and a desire to get things done to agitation and lethargy*" (Rodemann, 1999, preface.)

She also suggests that Gestalt theorists are correct in surmising that pattern language (symbols with meaning) are hardwired to our brain and that we do seek the order and harmony that repeating or symmetrical elements give. Gestaltists believe that symmetry is the key to providing us with visual harmony and balance as the following example (figure 5) demonstrates:

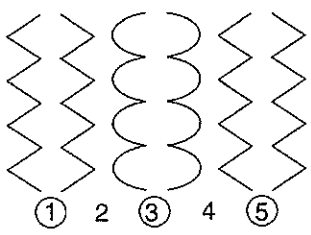


Figure 5

Symmetry (figure 5) provides us with visual balance. When we look at the above image we see 3 columns of 1, 3 and 5, and we tend not to see 2 and 4 easily as they are not symmetrical. Does this then mean that in order to achieve visual harmony (an essential contributor to beauty?), pattern must adhere to certain orders? What if we disobey the rules that theorists conclude are essential in providing harmony and look at what emotional response can result from disorder? In the above example greater interest may arise from creating pattern that is influenced by columns 2 and 4, but how would the viewer respond to such patterns? Is our brain 'hardwired' to nature so that we instinctively respond to patterns in a way that was once necessary for survival?

Pilot Study

An initial pilot study carried out in 2005 with a multi-national and multi-disciplinary group of eight postgraduate design students, set out to assess whether some of the established theories regarding decorative pattern and aesthetic preference are still relevant today.

Two categories of pattern, namely natural and geometric, were selected from historical archives, with 3 differing types in each category. The selected categories represented two issues: the seeming disorder that nature engenders, and the order of geometry. All pattern types represented throughout this project were presented in greyscale in order to eliminate colour confusion.

Care was taken to choose pattern designs that were not 'in fashion' at the time of the research as Rodemann states in her research that pattern preference may be influenced by fashion (Rodemann, 1989), and although this is an area for investigation itself, this pilot study focused on established theories about decorative pattern and aesthetics, and our emotional responses to it.

The study set out to explore five visual assertions, namely:

1. When looking at pattern, too much regularity makes the pattern appear uninteresting to the viewer; it is the break in the order that creates interest and possible pleasure (Gombrich, 1984).

2. Hand rendered work is more aesthetically pleasing through the irregularity of the hand of the maker (Pye, 1971).

3. People prefer natural forms above all others (Rodemann, 1999).

4. Natural form should always appear rooted (Jones, 1886).[2]

5. In pattern design, nature should never be an exact copy; it is the interpretation of nature by the artist that makes the design aesthetically superior (Yanagi, 1972).

The following six decorative patterns each reflect some of the elements relating to the aforementioned assertions were shown to the participants.

[2] In this study 'rooted' means that the natural forms appear to be growing and attached to stems



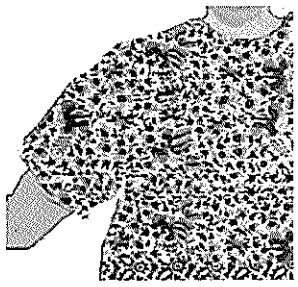


Figure 6, 7

Figure 6 represents an ordered, all over structure with obvious symmetry that does not provide the viewer with an interesting break in the order, therefore according to Gombrich we should find this relatively uninteresting, however the Gestalt law of symmetry tells us we should find it pleasing. The forms themselves are stylised showing an interpretation from nature by the artist but the forms do not appear rooted and seem to float. The design has probably been hand block printed and is Asian in origin.

Figure 7 represents a seemingly disordered pattern without any clear repetition or symmetry therefore according to Gombrich we should find this satisfying to view, as there are breaks in the order. The forms are stylised and show an interpretation from nature by the artist as well as appearing rooted. This pattern should according to the theories, have been the most successful in terms of aesthetics and visual harmony. The design is Asian in origin.



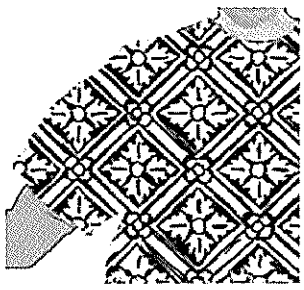
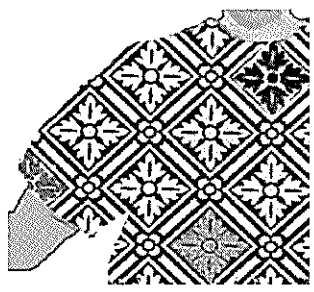


Figure 8, 9

Figure 8 represents realistic natural form, which looks almost photographic therefore it is depicting nature as it actually appears. The interpretation by the artist is more ambiguous than the other patterns and there is no repetitive structure, obvious symmetry or order. The forms are clearly rooted and 'growing' from the branches. The design is European in origin. Figure 9 represents a hand drawn interpretation of a geometric design. There is no break in the order of the motifs and the forms do not appear rooted, they float within a grid structure. There is a strong sense of symmetry. The pattern is from a European wallpaper design.



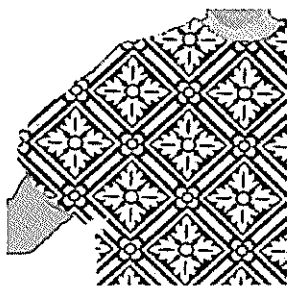


Figure 10,11

Figure 10 has the same geometric design as 4 with elements (in the form of different decorative motifs) that break the order of the pattern.

Figure 11 has the same pattern again, regular ordered geometry with no break in the order. It is simply the same motif repeated within the grid structure. This design has a strong sense of symmetry.

Evaluation

There were eight participants ranging in age (21-41 years) and gender (three male and five female) from a mixture of cultural backgrounds (European, Asian and Chinese). Participants were shown all six designs on an overhead projector, and asked to respond to the following questions: Which design from figures 6 to 8 do you find the most pleasing? Which design from figures 9 to 11 do you find the most pleasing? Which design overall do you find the most pleasing?

Each participant was given approximately 5 seconds to view each of the pattern designs. For figures 6-8, which displayed the natural patterning, 87.5% of participants chose figure 7 as the most pleasing with 12.5% choosing figure 6. For figures 9-

11 which displayed geometric patterning, 100% chose figure 6. The pattern they found most pleasing from the collection of geometric and natural patterns, 87.5% of the participants chose figure 7 (natural pattern) and 12.5% chose figure 8 (natural pattern).

From this small study four main issues can be directly drawn:

1. Motif preference may be linked with culture.
2. Age does not appear to affect choice.
3. Natural form preference is cross cultural.
4. Gender did not affect choice.

The one Asian participant preferred figure 6, which originated in Asia, yet the Chinese and European participants chose figure 7. Decorative patterns in the West have become hybrids of many styles emanating from various traditional symbols and structures. This result raises questions as to whether or not certain cultures still have a strong association with traditional motifs and layouts. A larger sample may help clarify this.

Rodemann's study of pattern conducted in the USA in the 1980s found that age affected participant preference for pattern, yet this small study did not. Are we becoming less sensitive to pattern through constant exposure to it? Decorative pattern has been revolutionised by the use of digital printing and there is an abundance of choice in the marketplace and a greater exposure through the media of diverse imagery. However, this study may not have had a big enough age range to make age an issue and the sample was very small. Future research should consider using a wider age group.

Natural form was the preferred choice amongst the participants and 82.5% chose a rooted design, however the sample choice of designs presented from was small, and a larger variety of samples may provide a different result. This will be considered in a future study.

Overall preference by the participants (100%) indicated that they did prefer designs that show an interpretation of nature by the maker, however a larger sample of participants and designs, particularly realistic motifs afforded through digital print work will be used in a future study.

Further to these points it can be added that the most important factor to visual harmony in pattern design, in this study, was not order and symmetry but breaks in order or disorder (asymmetry). In general the pilot study confirmed that irregularity in pattern is a common thread in attracting visual interest as the participants found patterns containing irregular aspects more aesthetically pleasing. However there are issues with context, i.e. the participants were told they were going to be shown decorative pattern designs and then shown the selected patterns on a T-shirt, therefore they made their decisions accordingly, possibly connecting the patterns to something they would wear themselves. Would they have selected differently if they were asked to select which one would be most aesthetically pleasing within the context of a room? Future research would consider presenting patterns out with a specific context.

Pattern may have more than one purpose. The researcher chose pattern types in this study that contained elements, that when viewed might ascertain whether or not certain theories relating to decorative pattern are still relevant today. However some of these assertions, dealing with nature and rooting for example, date back to the 19th century. Yet this study found that generally a mixed group of individuals chose the design that contained all the necessary elements that should equate to a pleasant aesthetic experience. Is it then the rhythm of the pattern and the whole experience of the view that makes this work? Seeing the whole picture as Gestaltists say, can decorative pattern have a purpose beyond pleasure? Can decorative pattern confront or create unease?

Proposed Future Study

This second section of the paper outlines a proposed project that will continue this research, and attempt to establish what types of pattern provoke an emotional response in the viewer and to identify the emotional responses evoked. The questions leading this next stage are: Does surface pattern,[3]

[3] surface pattern – although surface pattern is a feature of many aspects of our lives, within this research it refers to pattern types that are available on a wide range of fashion and interior products in the high street market within western culture and may have originated in another culture.

when viewed in a dynamic[4] state provoke the same emotional reactions in the viewer (positive or negative) as it does when viewed in a static state?

This pilot study proposes to look at a method that could evaluate how we perceive (read and understand) various types of surface patterns in both a static and dynamic state and assess their impact on our senses i.e. pattern can transform what we are seeing into an emotional response (the psychophysical) therefore this study will examine the relationship between types of decorative surface patterns and the physical aspect of seeing, and the individuals emotional response to the view. The outcome of this pilot study will help us to understand the potential of order and disorder within pattern, the role of the designer to see and interpret the 'view' and the response of the viewer.

Some patterns have the ability to make us take notice while others do not. A psychologist David Canter (1974:104) explains how we respond to visual information (in this study it is pattern) in what he calls our 'arousal curve'. He argues that responses to stimuli form a bell curve ranging from non-engaging to over stimulating and this is significant as we look at the various functions of surface pattern: camouflage to disguise or blend in; contrast to stand out, appear strong or confident, and decoration and ornamentation to attract, give pleasure or aesthetic satisfaction

These 3 functions of pattern correspond with Canters bell curve as they move from one extreme to the other, where camouflage equals non-engaging, decorative equals comfort zone, and contrast equates to over stimulation.

Within western culture decorative surface pattern is used extensively in clothing and interior products, therefore we are bombarded with one type of pattern over all others. Therefore is 'too much of the same' having numbing effect on our senses causing pattern to become almost meaningless in an emotional context and lack value in itself?

[4] dynamic – refers to movement that is intended to appear as a) undulating or rippling and b) rotating image. Although there is a strong affinity with cloth the project itself is not using cloth or particular cloth types.

Conclusion

This proposed new research project builds on a pilot study carried out at an earlier stage and is intending to identify a method of assessing emotional response to decorative pattern in both a static and dynamic state through information gathered from participants in the form of semantic differentials. As Canter (1974) points out, we emotionally respond to visual stimuli in various ways and he uses a bell curve to demonstrate how we move from the bottom of one side of the 'bell', up through its arc to the summit, before descending back to the base again at the other side. This research then may help to determine how decorative pattern could be more effectively utilised within various contexts out with fashion. The results of this study could be beneficial in the following areas, for example:

• NASA *'TransHab' project.* TransHabs are inflatable space station modules. This research would be relevant to the living environment and well being of a TransHab crew as pattern could help counteract horizontal and vertical confusion experienced by crewmembers in space. Also research into pattern language and symbols with meaning would help identify pattern types that could be used as emotional anchors in an alien environment.

• *Research and Education.* This research would contribute to the growing body of academic research into design, emotion and technology, i.e. Jane Harris' (Central St. Martins) digital studies of movement and cloth. As a lecturer in textile design the results of this study and the process of analysis will be utilised in textile design pedagogy.

• *Safety wear.* Pattern that triggers over stimulation on the arousal curve may be used effectively in the following contexts;

• *Children's outerwear.* Work wear for various environments and conditions

• *Competitive clothing/sportswear.* Patterns that appear strong, hostile or accentuate movement may set an opponent at a disadvantage

• Health and wellbeing. Patterns surround us within healthcare environments. This study may highlight certain patterns that may promote relaxation and calmness or promote activity.

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LIMITED UTTERANCES WITHIN JOURNALS: THE FUNCTIONALITY OF ARCHITECTURAL DISCOURSE ON EARTHQUAKE AS DISASTER

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Abstract

The purpose of this study is to emphasize the 'critical awareness' of the ambiguous relationship between architecture and its discursive realm. Although it is possible to suggest the identity of architecture to be gained through the 'structural, semantical or communicational nature' of discursive frameworks recalling Foucault's statement, "There is no non-discursive realm, that everything is constructed and apprehended through discourse", the association of architecture to the realm of discourse still constitutes a problematic to be dissolved.

Sketchily defining discourse as a functional language, the argument through the paper will attempt to construct the functions –creative, constitutive, epistemological, and representational- of architectural discourse by means of a Foucaultian reading. Initially, it is essential to underline the productivity and creativity of discursive practice, which creates a 'center' and a 'margin' taking the role of socio-cultural reproduction in late modern societies. Secondly, discursive structures play a significant role in systematically forming and *transforming* their 'subjects' and 'objects', rather than the converse. Thirdly, discourse contributes to the construction of systems of knowledge. As a strategy, it constructs the architectural theory by conceptualizing the realm. In the fourth sense, discourse is a representational practice, that is, it brings phenomena into the scene.

If we take granted that "the discourse is an actually occurring piece of language whose dimensions are dictated by the situation", all the utterances –written and spoken- about the earthquake constitute a 'mega-utterance', which we can call 'the discourse of architecture on the subject of earthquake'. Having established the functional task of discursive practice, this paper will make a systematic survey of architectural discourse on the earthquake phenomenon as a case study through local architectural journals, namely *Mimarlık, Ege Mimarlık, Yapı, Tasarım, XXI, Arredamento Mimarlık, Mimarİst* and *Batı Akdeniz Mimarlık*. In other words, it will attempt to constitute a discourse analysis, which shows how texts work within socio-cultural practice.

1. Introduction

If we take granted that 'the discourse is an actually occurring piece of language whose dimensions are dictated by the situation', all the utterances –written and spoken- about the phenomenon of earthquake constitute a 'mega-utterance', which we may call 'the discourse of architecture on the subject of earthquake'. After establishing the functional task of discursive practice, this paper will make a systematic survey of architectural discourse on the earthquake phenomenon with a case study through local architectural journals, namely *Mimarlık, Ege Mimarlık, Yapı, Tasarım, XXI, Arredamento Mimarlık, Mimarİst* and *Batı Akdeniz Mimarlık*[1]. In other words, it will attempt to constitute a discourse analysis, which shows how texts work within socio-cultural practice. Hence, the main

[1] The selection of the journals does not preclude any journal outside the set for the reliability of the study and to provide variability to the discourse samples. In the direction of this aim the date of the journals start from 1969, end by the recent issues. Accordingly the research of *Mimarlık* includes from 1-325. issues, *Ege Mimarlık* includes from 1-50, *Yapı* includes from 1-217, *Tasarım* includes 1-163, *XXI* includes 1-51, *Arredamento Mimarlık* from 1-198, *Mimarİst* from 1-20 and *Batı Akdeniz Mimarlık* from 1-34. The news part about the earthquakes is consciously not included within the objects of the study.

idea is to convey and construct a mental map to understand the approach of architectural discourse on the phenomenon of earthquake disaster, which is closely related to the practical realm of architecture.

Initially and inevitably, it is significant to put forward the vague relationship of the field of architecture with the term discourse. Architecture itself can be put forward as a discourse, but as defined by Basa, it can also be considered as a concept shaped around a vast majority of concepts which function as another group of discursive figures. (Basa, 2000, 97) Although architecture has visual tools to construct its identity, it also needs the support of the linguistic area to reinforce its status related with its identity. By these means, architecture presents its identity including its concepts through its discursive tools. Foucault's expression, 'There is no non-discursive realm, that everything is constructed and apprehended through discourse.' (In Mills 1997, p. 55); will be a readily acknowledged idea to construct the scheme for this study. Since every single phenomenon is to be understood through discourse, the method of getting familiar with the phenomenon of disaster is to get familiar with the construction of its discourse within the realm of architecture.

There are two modes of the existence of a discourse. A discourse may arise individually and belonging to a system of networks as well. The idea of selecting individual texts and analyzing them in order to merge on a spine emerges from this dual mode of existence. Therefore it is essential to realize the relationship between "the self to itself" and "the relationship to the network of discourses" as mentioned by Brown (2000). According to Foucault (1972, pp. 73-75), this dual existence is affected by two levels:

> The mobility of the system of formation appears in two ways. First at the level of the elements that are being related to one another: these in fact may undergo a number of intrinsic mutations that are integrated into a discursive practice without the general form of its regularity being altered...but inversely the discursive practices modify the domains that they relate to one another.

Within this approach, it is possible to suggest that the sub-elements of a discursive formation -in our case the discourse of architecture on disaster- play a significant role in the structure of the mega-utterance, the main discourse. Because it is much more important to figure out what kind of an understanding architectural discourse develops about the phenomenon of disaster, how it analyses that phenomenon and how it reacts against that phenomenon than to understand the similar acts in the realm of sub-discourses.

If the term discourse is characterised as a functional language, the argument through the paper will attempt to construct the functions -creative, constitutive, epistemological, and representational- of architectural discourse by means of a Foucaultian reading. In order to make an analytical research on the discursive aspect of architecture, it is important to define the object of the study. In this research, the main aim will be to consider "text" as the object of discourse. The importance of the "text" is explained by Bazerman (1984, p. 31) as:

> The reflexive rhetorical turn in knowledge-producing disciplines has called attention to the text, which is the medium through which knowledge is transmitted and is the matter in which knowledge is embodied outside the consciousness of any individual. Although text only gains meaning through the interpretive act of the reader, nonethe¬less text is the representation of knowledge that reaches beyond the mind of any individual. Text is knowledge that stands between people.

Text itself cannot be considered as discourse. Therefore, in order to analyse a text, or a group of texts, it is significant to locate them within the overall discursive practices. Discourses can be created by surveying texts, while texts are as well created by discourses. According to Cook (1994, p. 25), discourse, as opposed to text, is a stretch of language in use, taking on meaning in context for its users, and perceived by them as purposeful, meaningful and connected. This quality of perceived purpose, meaning, and connection is known as coherence. Discourse analysis is the study and explanation of this quality of coherence. A discourse is a coherent stretch of language. This coherent relationship between the text and discourse is elucidated by Fairclough (1992, p. 24) as follows:

> A text is a product rather than a process - a product of the process of text production. But I shall use the term *discourse* to refer to the whole process of social interaction of which

a text is just a part. This process includes in addition to the text the *process of production*, of which the text is a product, and the *process of interpretation*, for which the text is a resource. Text analysis is correspondingly only a part of discourse analysis, which also includes analysis of productive and interpretative processes. The formal properties of a text can be regarded from the perspective of discourse analysis on the one hand as *traces* of the productive process, and on the other hand as cues in the process of interpretation.

Texts are grouped into three by Werth as descriptive, narrative and discursive. (In Fairclough, 1992, p. 15) The texts summed up for the study are considered to be discursive, and the discursive potentials of these texts will be explored. With the texts put on the map, the important work will be to intertextually analyse what kind of a discourse they construct and observe if they can function in the way discourses are assumed to function. As supposed by Fairclough (1997, p. 10), intertextual analysis links the text and discourse practice dimensions of the framework and shows where a text is located with respect to the social network of orders of discourse- how a text actualizes and extends the potential within orders of discourse.

We will be limiting the scope of the study to the analysis of the texts within architectural journals. The reason here to recourse to journals, in other words, to assume that journals are the most important sources is verified by Crysler (2003, pp. 3-4) as:

> I argue that journals and their discourses matter: texts have a determinate effect on how we understand, imagine, and act in relation to the world around us. Texts and writing play an instrumental role in shaping the crit¬ical and imaginative space in which members of a built environment profession - architecture, planning, urban design – operate. 8y intervening in the politics of writing we intervene in the politics of built form. Each journal is therefore studied as a space of knowledge, governed by shared methods and practices.

2. The Content Analysis

The initial step will be to categorize the texts acquired through a methodological survey through the local architectural journals. This categorization necessitates differentiating the contents of the texts. As Potter (1987, p. 41) puts forward, 'the technique social psychologists have traditionally used to deal with participants' open-ended discourse is content analysis. This involves the generation of categories, which can be reliably coded and imposed over the data for the purposes of hypothesis testing. The categorization is significant since there is a network of discourses'. We are trying to distinguish a rational order or relationship between the discourses for the presentation of interrelation. Foucault puts this comparative method as:

> In the sixteenth century, the fundamental supposition was that of a total system of correspondence (earth and sky, planets and faces, microcosm and macrocosm), and each particular similitude was then lodged within this overall relation. From now on, every resemblance must be subjected to proof by comparison, that is, it will not be accepted until its identity and the series of its differences have been discovered by means of measurement with a common unit or more radically by its opposition in an order (In Harding 1992, p. 80).

In the seventeenth or eighteenth century, scientific discourses began to be received for themselves; the author function faded away (Rabinow, 1984: 109). Considering this idea of the disappearance of the authorship, we find it correct to analyse the texts independent of their authors. Then what element, if not the authorship, is crucial for the analysis of texts? We put this constituent as the 'content analysis' for this particular study. Therefore it is important to establish typologies for discursive objects in analysing them. We will realize the categorizations along with their identity and difference.

Accordingly, the study will mainly rely on the content of that discourse under technical and social approaches including the sub-categories as follows: "The discussions on the technical reasons of the damage caused by earthquake in terms of materials, the construction type and the structural system and the discussions on the principles of earthquake-resistant architectural designs; the discussions on the phenomenon in terms of the processes of urban planning and land-use decisions; the temporary and permanent housing problematic and their place in our design culture and their discussion

as a representational space in terms of ideology and the phenomenon of participation as well; the informative and historical discourse about the nature of earthquake and pre-earthquake cautions; discussing the social role of the architect in the disaster; the criticism of the politics of the municipalities, and the state as well, in terms of land-use decisions and post-earthquake applications and thus the transformation of a natural disaster to a cultural one; the influence of the earthquake phenomenon on architectural education". The categorized objects are listed as below:

A. THE TECHNICAL APPROACHES

1. Discussing the technical reasons of the damage caused by earthquake in terms of materials, the construction type and the structural system and the discussions on the principles of earthquake-resistant architectural designs:

- Events of Nature Should not Turn into Disaster, M. Uçar, *Tasarım*, p. 118.
- Can We Avoid Earthquake? S. Serinken, *Mimarlık*.
- After Bingöl Earthquake, Y. Subaşı, *Mimarlık* 312, 2003, pp. 64-5.
- Resistance to Earthquake: Lessons to Be Taken From Traditional Buildings, E. Komut, Mimarlık 299, 2001, pp. 33-40.
- A Study On the Situations of Traditional Buildings After the Earthquake, A. R. Parsa, *Mimarlık* 299, 2001, pp. 41-42.
- Impressions from the Studies of Assessment of Damage, D. Gülhan, İ. Özyörük Güney, *Mimarlık* 299, 2001, p. 43.
- 1999 Marmara Earthquake and the Principles of Earthquake Resistant Structure Design, M. Düzgün, *Ege Mimarlık* 40-41, 2001, pp. 91-6.
- Comparing the Damages Created by the Earthquakes of 1894 and 1999, Affecting Istanbul, on Some Ottoman Buildings, B. Erçağ, *Yapı* 215, 1999, pp. 33-4.
- The Pre-assessment Report for Kocaeli Earthquake by Istanbul Technical University, *Yapı* 214, 1999, pp. 29-33.
- The Demolition of Buildings in Earthquake is Not a Fate, T. S. Arda, *Yapı* 214, 1999, pp. 40-41.
- More than the Schematism of Post-Earthquake, N. Ayıran, *Yapı* 216, 1999, pp. 57-59.
- The Bitter Face of Nature: Izmit Earthquake, H. Sucuoğlu, *Mimarlık* 288, 1999, pp. 17-19.
- Two Earthquake Reports, *Mimarlık* 288, 1999, pp. 20-23.
- New Earthquake Regulation and Structure Design, M. O. Akbaşak, B. Özlen, *Ege Mimarlık* 29, 1998, pp. 10-11.
- Adana – Ceyhan Earthquake, H. Topal, F. Okutucu, *Ege Mimarlık* 28, 1998, pp. 13-4.
- Radius Project and the Educational Seminar in Japan, F. Selvitopu, *Ege Mimarlık* 28, 1998, pp. 15-6.
- Earthquake and Structures, A. Kurdik, *Mimarlık* 24B, 1998, pp. 5B-60.
- Is Dinar Earthquake a Simple Theft Case? G. Birkan, *Yapı* 168, 1995, pp. 26-7.
- What Dinar Earthquake Makes Us Think of, S. S. Tezcan, *Yapı* 16B, 1995, pp. 3B-41.
- What August, 17, 1999 Kocaeli Earthquake Makes Us Think of, S. S. Tezcan, *Ege Mimarlık* 32, 1999, pp. 4-6.
- Observations on Marmara Earthquake, M. O. Akbaşak, *Ege Mimarlık* 32, 1999, pp. 7-9.
- Impressions from the Great Earthquake, M. Hamuroğlu, *Ege Mimarlık* 32, 1999, pp. 16-B.
- What March, 13, 1992 Erzincan Earthquake Makes Us Re-Think of, F. S. Okutucu, *Ege Mimarlık* 5, 1992, pp. 17-B.
- Observations from Erzincan Earthquake, K. Özgen, F. Çılı, O. C. Çelik, *Yapı* 129, 1992, pp. 35-41.
- The Preliminary Results of Bingöl Earthquake Observations, B. Güven, G. Gezin, *Mimarlık* 4-5, 1971, pp. 30-32.
- The Principles of Constructing Earthquake Resistant Buildings and Some Observations on the Recent Earthquakes, M. İpek, *Mimarlık* 4-5, 1971, pp. 34-39.
- Earthquake and the Destiny of the Technical Man, H. Çakır, *Mimarlık* 4-5, 1971, pp. 41-42.
- The Problematic of Earthquake, M. Göktuğ, H. Çakır, *Mimarlık* 12, 1971, pp. 43-44.
- Gediz Earthquake, Ersin Arıoğlu, K. Anadol, *Mimarlık* 4, 1971, pp. 45-55.
- Report of Gediz Earthquake, *Mimarlık*, Chamber of Architects Istanbul, 1970, pp. 26-32.
- Sakarya Earthquake, *Mimarlık*, Chamber of Architects Istanbul, 1967, pp. 8-11.

2. Discussing the phenomenon in terms of the processes of urban planning and land-use decisions:

- Re-organization of Three Cities at the End of War and Disaster: Beyrut, Saraybosna, Erzincan, E. M. Komut, *Mimarlık* 306, 2002, pp. B-12.

• The City Formed By Earthquakes: Erzincan, A. Gül, B.Şengezer, E. Koç, *Yapı* 168, 1995, pp. 78-86.
• Restructuring of the City by Greening, T. Ando, *Mimarlık* 311, 2003, p. SS.
• Thoughts on Re-Development of Earthquake Areas, W. Schutte, *Batı Akdeniz Mimarlık* 13, 1999.
• Determination of the Massive Damage Regions and Its Importance in Urban Planning, D. A. Keçeli, M. Cevher, F. Avdan, *Mimarlık* 316, pp. 59-61.
• Thoughts on Earthquake and Urban Science, B. Çeçener, *Mimarlık* 290, 1999, pp. 55-57.
• Our Legislation in Disaster Viewpoint: A Model Proposal Corresponding The Adjustment of The Institutional Structure, B. Şengezer, H. Kansu, *Mimarlık* 290, 1999, pp. 49-54.
• Re-Organization of the Processes of Planning and Structuring To Reduce Disaster Costs and METU Proposal, M. Balamir, *Mimarlık* 288, 1999, pp. 12-16.
• Evaluation of Istanbul Earthquake Master Plan, A. Yeşilırmak, *Mimarist* 9, 2003, pp. 40-42.
• The Success of Disaster Management is Related to the Success of Risk Management – Colloquy, A. Yeşilırmak, F. Öcal, *Mimarist* 9, 2003, pp. 43-6.
• The Scope and the Quality of Istanbul Earthquake Master Plan, M. Balamir, *Mimarist* 9, 2003, pp. 47-54.
• Istanbul Earthquake Master Plan: Avoidance and Action Planning through Geographical Information Systems, H. Türkoğlu, *Mimarist* 9, 2003, pp. 55-58.
• Istanbul Earthquake Master Plan- Settlement and Law, IDMP YTÜ Project Group, *Mimarist* 9, 2003, pp. 59-64.
• Writing a Prescription on the Earthquake Glow of Istanbul, H. Sucuoğlu, *Mimarist* 9, 2003, pp. 65-8.
• Land-use Decisions in Earthquake Regions, B. Sayın Şengezer, *Yapı* 215, Ekim 1999, pp. 70-79.

3. The temporary and permanent housing problematic and their place in our design culture and their discussion as a representational space in terms of ideology and the phenomenon of participation as well:

• The Production of Housing for Post- Earthquake, I. Davis, trans. F. Oymak, *Mimarlık* 76/3, pp. 10-14.
• The Production of Housing after the Earthquake, M. Tapan, *Mimarlık* 8-9, 1975, 11-12.
• The Earthquake Housing ofBan: Paper Log-Huts, S. Ban, Arredamento *Mimarlık*, pp. 81-85.
• Permanent Earthquake Housing in Adapazarı, Arredamento *Mimarlık*, pp. 93-5.
• Sheltering in the Stage of Urgent Help after the Disaster: Sustainability-A System Approach, S. Limoncu, *Mimarist* 2006/2, pp. 36-43.
• Structuring Proposals after the Earthquake –Post-Disaster Temporary Sheltering Units, H. Karabey, *Arredamento Mimarlık*, pp. 104-9.
• Container Houses, H. Tümertekin, İ. Bilgin, N. Sayın, *Arredamento Mimarlık*, pp. 93-4.
• A Different Option in Earthquake Houses: Bubble Domes, S. Özkan, *Mimarlık* 3, 1972, 35-7.
• Mass Housing Applications on Account of Disaster, E. Subaşı, *Mimarlık*, 1978, pp. 53-6.
• Earthquake and Prefabricated Structures, G. Birkan, *Mimarlık* 4-5, 1971, p. 42.
• Temporary Earthquake House Proposal, Mimarlı Design Group, *Arredamento Mimarlık*, pp. 86-7.
• Earthquake Houses as a Representational Space, A. Baykan, *Arredamento Mimarlık*, pp. 107-111.
• Leaving Document to History: On the Permanent Earthquake Houses (Colloquy) *Mimarlık* 309, 2003, pp. 35-47.
• The Studies Done in Marmara Region in the Second Year of the Earthquake and the Latest Situation, K. Savaşır, *Ege Mimarlık* 39, 2001, pp. 30-32.
• The Place of Earthquake Houses in Our Design and Planning Culture, G. Erten, *Mimarlık* 309, 2003, pp. 48-9.
• Temporary and Permanent Houses after August, 17 and November 12 Earthquakes-The Problem of Density, H. Yürekli, S. S. Saylağ, *Mimarist* 9, 2003, pp. 69-74.

4. The informative and historical discourse about the nature of earthquake and pre-earthquake cautions:

• Micro Zoning, R. Pınar, Z. Akçığ, *Ege Mimarlık* 45, 2003, pp. 43-48.
• The Importance of the Geological Structure of İzmir in Urbanization, H. Gümüş, *Ege Mimarlık* 32, 1999, pp. 12-15.
• Earthquake Regions Map: A Macro Danger? Or a Micro One? Or A Macro Zoning? Or Is It a Micro Zoning Map? R. Demirtaş, *Batı Akdeniz Mimarlık* 27, 2004, pp. 19-21.
• On İzmir Earthquake, C. Helvacı, *Ege Mimarlık* 6-7, 1992, pp. 21-2.

• Seismology and Earthquake, K. Ergin, *Mimarlık* 4-5, 1971, pp. 32-33.
• The Traces of Earthquake in Old Anatolian and Aegean Civilizations, Ş. Karagöz, *Mimarlık* 303, 2002, pp. 44-49.
• The Great Earthquakes in Istanbul and Their Effects on The Cultural Heritage, the Precautions to Be Taken, Z. Ahunbay, *Mimarist*, 2005/4, pp. 17-18.

B. THE SOCIAL APPROACHES

1. Discussing the social role of the architect in the disaster:

• Forum- The Role of the Architect in Transforming Earthquake into a Disaster, *Mimarlık* 307, 2002, pp. 14-19.
• Houses That Lose Confidence, S. Erder, *Mimarlık* 293, 2000, p. 69.
• Necessities, Design, Earthquake, H. Topal, *Ege Mimarlık* 32, 1999, pp. 19-20.
• The Role of the Architect in Earthquake Sensitive Designing Processes – Colloquy, *Mimarlık* 30B, 2002, pp. 57-61.
• Developing Earthquake Consciousness in Architectural Design, A. İ. Ünay, *Mimarlık* 290, 1999, pp. 46-B.
• Have the Architects Passed the Earthquake Exam?, A. Şentek, *Mimarlık* 2BB, 1999, pp. 10-11.
• Earthquake Sensitivity in Architectural Design, E. Özkan, *Mimarist* 9, 2003, pp. 75-78.

2. The criticism of the politics of the municipalities, and the state as well, in terms of land-use decisions and post-earthquake applications and thus the transformation of a natural disaster to a cultural one:

• Re-discover of the neighbourhood, the executive officer of a district, and the architect in Gayrettepe: The Disaster Management of the Neighbourhood, Ahmet Turhan Altıner.
• Earthquake Containers of Istanbul, the Chest of the State, XXI Nisan 2003, pp. 10B-9.
• Earthquake and Underdevelopment, İ. Acaroğlu, *Mimarlık* B-9, 1975, pp. B-10.
• Earthquake and Afterwards, G. Birkan, *Mimarlık* B-9, 1975, 13-19.
• Does Earthquake Still Continue? H. Günal, *Mimarlık* 307, 2002, p. 20.
• Earthquake and the Political Enactment, M. Balamir, *Mimarlık* 307, 2002, pp. 21-3.
• The Compulsion of a Consistent State Politics, E. Kulaksızoğlu, *Mimarlık* 310, pp. 33-36.
• What August, 17 Earthquake Makes Us Think Of, G. Dinç, *Ege Mimarlık* 32, 1999, pp. 21-22.
• The Human Oriented Solutions after the Earthquake, Y. Gürsel, *Yapı* 217, 1999, 51-55.
• What Does Buildings Older Than 10 Years Should Not Be Interrogated Mean?, M. N. Cebeci, *Ege Mimarlık* 5, 1992, p. 19.
• In The Process of Restructuring..., H. Karabey, *Mimarlık* 2B9, 1999, pp. 42-5.
• The Restructuring of the State Should Be Overviewed, Colloquy: N. Cebeci, *Mimarlık* 289, 1999, pp. 46-9.
• Expertness and the Sphere of Architecture, M. K. Atabaş, *Mimarlık* 308, 2002, p. 62.
• Following Dinar Earthquake, H. Topal, *Mimarlık* 266, 1995, pp. 55-56.
• Gediz, Emet, Varto, Fethiye, Lice, Erzincan is not Enough ...And also Dinar, F. M. Uğurlaş, *Mimarlık* 266, 1995, p. 56.
• An Application Model For Post-Earthquake Restructuring for Erzincan Earthquake, H. Aksu, *Mimarlık* 24B, 1992, pp. 54-B.

3. The influence of the earthquake phenomenon on architectural education:

• Temporary Shelter after the Disaster: The Applied Project Study, S. Soygeniş, *Arredamento Mimarlık*, pp. 102-103.
• Does This Earthquake Strike Architectural Education? B. Ak, *Ege Mimarlık* 32, 1999, pp. 10-11.
• The Design Studio Trials After the Disaster, A. Balamir, A. Tokol, *Arredamento Mimarlık*, pp. 82-5.
• Idea Competition on the Earthquake Compatible Settlements, *Mimarlık* 309, 2003, pp. 2B-34.

According to the scheme above, it is straightforward to observe that some concepts are emphasized a lot more than some of the others. Repetition of a concept indicates that it constitutes a problematic. According to Mills (1997, p. 70), 'Foucault focuses on the rarefaction of discourse as an internal discursive constraint. What he means by rarefaction is the surprising fact that although the utterances which could be produced by any one person are theoretically infinite, in fact they are remarkably repetitive and remain within certain socially agreed-upon boundaries'.

In addition to the categorization process, it is also important to clarify the need to analyse the discourses. Discourses emerge from social contexts, and it is the mission of these social contexts to operate in the development, circulation and maintenance of discourses. This necessity is explained by Mills (1997, p. 11) as:

> Thus, a discourse is not a disembodied collection of statements, but groupings of utterances or sentences, statements which are enacted within a social context, which are determined by that social context and which contribute to the way that social context continues its exis¬tence. Institutions and social context therefore play an important determining role in the development, maintenance and circulation of discourses.

3. Thinking about the Functions of Discourse

As mentioned by Mills (2003, pp. 62-4), Foucault describes discourses, or discursive formations, as groups of statements which deal with the same topic and which seem to produce a similar effect; for instance, they may be groups of statements which are grouped together because of some institutional pressure or association, because of a similarity of origin, or because they have a similar function. Pursuing Foucault's statement that discourses have functions; the main aim of this part will be to demonstrate the functions of discourse in an analytical approach. It should be thoroughly put forward because the clarification of the function of a phenomenon might most of the times indicates the clarification of its *raison d'etre*. Therefore to establish the functional scheme of a group of discourses will also lead to demystify the vagueness in the recognition of the realm of architecture as a discursive practice.

A. THE CREATIVE FUNCTION OF THE DISCOURSE:

The reason of analysing the phenomenon of disaster through the texts –although there is a bunch of visual materials to make use of- is without doubt the conviction about the power and productivity of the text.

The creative function of the discourse can be analysed through its fruitfulness aspect. Fruitfulness, according to Potter (1987, p. 171), refers to 'the scope of an analytic scheme to make sense of new kinds of discourse and to generate novel explanations. This is, of course, a general criterion of validity for scientific explanations and theories; if they can be used to generate fresh solutions to the problems in a field of research then we accord them more respect'.

The fruitfulness can be observed in two modes: discursive and practical, which are respectively the production of new texts and thus new themes and the production of new solutions in terms of design, construction and legal issues. In the first mode, it reproduces another discourse -e.g. representational space- by mingling two discourses, so this reproduction is also productive in the sense that it makes the audience also consider the other theme. In the second mode, the sub-discourses are provocative with what they propose. This provocation leads them to be creative. To lead new solutions, the necessity of which was not needed before the disaster, and to verbalize these solutions is valuable. All these attempts improve the vocabulary of design, construction and the laws related to both. Discourse is creative also in the sense that through novel concepts, it takes on a role of socio-cultural reproduction. Through this discursive approach, a certain track is generated and this discursive approach delineates the agenda on that particular discourse. It also determines the social practices around that discourse.

In no other discursive part of architecture, so many new approaches to a problematic have been produced than the ones on the phenomenon of disaster. Thus it is likely to state that it necessitates being productive. The mode of productivity is indicated below under our pre-constructed categorization:

The Technical Approach:
1. Innovative methods of construction, exploring new materials, new ways of earthquake resistant designing, reconsidering traditional buildings.
2. Novel proposals for re-development, a model proposal to heal the institutional structure, re-organization of the processes of planning and structuring to minimize earthquake damages; the urban functioning potentials of Istanbul.
3. Improving the design culture and vocabulary by brainstorming about the new ways of housing either temporary or permanent one, to find ways of sustainable housing: the example of paper log-hut.

4. The inspiring historical information might provide to be creative.

The Social Approach:
1. Discussing about the responsibilities of the architect may force the audience to be creative in the sense of neighbourhood disaster management, participation, getting organized, etc.
2. The criticism of the bureaucratic institutions may develop a new consciousness including the architect. The criticism also makes the politicians consider novel solutions to land-use decisions and post-earthquake applications, supervision regulations or systems, expertise studies, compulsory earthquake insurance etc. or develop new penalties for poor treatments.
3. The provocative and productive power of the earthquake on architectural discourse provides the organization of competitions, summer schools, panels and symposia:

- Earthquake Planary, 13 March 1986, Istanbul.
- Earthquake Symposium, Kocaeli University, 23-25 March 2005.
- Earthquake and Architecture, Planary, Chamber of Architects, Antalya, Yapı 2000, 2-11.
- Case Assessment in the Second Year of the Earthquake, 18 August 2001, Istanbul, Panel-Forum.
- Preparing Cities for the Earthquake and the Reality of Istanbul, Symposium, 8-9 February 2002, ITU.
- Earthquake Seminar, 6 November 1999.
- Urban Settlements and Natural Disasters II. Region Study Program Workshop.
- Architects and Disaster, UIA Summer School 2004, 1-17 July 2004, Izmir.
- Natural Disasters: Designing for Security, UIA Study Program Conference.

B. THE CONSTITUTIVE FUNCTION OF THE DISCOURSE:

Texts are sensitive barometers of social processes, movement and diversity. Thus textual analysis is an important method in studies of social and cultural change (Fairclough 1999, p. 204). In a Foucaultian reading, discourses exist with their capacity to produce changes. Constitutive function of discourses plays a significant role in forming and transforming their objects. According to Howarth (2000, p. 52), Foucault seeks to account for the creation of its objects within discourse by relating them to the body of rules that enable them to form as objects and which thus constitute the conditions of their historical appearance. The course of discourses modifies its objects. Constitution in this sense can be interpreted as the transformation and the reconstruction of the new systems of knowledge and belief.

Secondly, discourses, for Foucault, constitute objects for us. One of Foucault's most famous quotations about the constitution of objects is the following: 'We must not imagine that the world turns towards us a legible face which we would have only to decipher. The world is not the accomplice of our knowledge; there is no prediscursive providence which disposes the world in our favour' (Mills 1997, p. 52). Constitutive role of discursive practice forms its objects rather than the reverse as expected. It is possible to decipher this proposition as the constitution of social entities. The mode of constitution is indicated below under our pre-constructed categorization:

The Technical Approach:
1. Transforming the traditional methods of construction, design and supervision: obtaining good quality concrete, use of the steel skeleton, and the designing capacity in concrete buildings, the compulsory construction supervision, the compulsory earthquake insurance system.
2. Transforming the regulations: regulations about shores, earthquake master plan, revision plans, development adjustment plan; transforming actions about Istanbul: learning to create and live urban life, action planning using GIS; transforming ways of disaster and risk management.
3. Transforming traditional methods of housing: alternative housing to prefabricated ones, sustainable sheltering in the process of urgent help.

The Social Approach:
1. Construction of a novel social model: the activation of the role of the architect.
2. Construction of a novel model of the official relationships through the questioning of the legal arrangements.

C. THE EPISTEMOLOGICAL FUNCTION OF THE DISCOURSE:

The third function of discourse is to produce knowledge. Every field of science forms its own episteme. Episteme is called by Foucault, as Steiner (1992, p. 85) mentions, "the aggregate of

significant spaces, the underlying stratigraphy of intellectual life, the whole set of the presuppositions of thought'. Since the significance of knowledge production is indicated by Deleuze as 'Everything is knowledge, this is the first reason why there is no savage experience there is nothing beneath or prior to knowledge' (In Brown 2000, p. 109), it is indispensable to argue that it is vital for the field of architecture to produce its very peculiar knowledge.

The discussion on the term discourse also emerges from the idea that episteme is produced through discourses. According to Cousins (1984, p. 27), discourse is the first representation of thought. As such, discourse and knowledge are closely related to each other. Knowledge is like a language whose every word has been examined and verified. Thus discourse presents knowledge and leaves it open to discussion and interpretation so that it has the power to modify and transform the accumulation of knowledge till that date.

How can we raise knowledge out of discourses? This can barely happen after discourse analysis since the ideas through discourses are coarse and they should be categorized. And the friction of the disparity provided by categorization presents us knowledge. This analysis should first clarify the status of its objects, the category they belong to and the function they possess. According to Foucault's discourse, 'knowledge is no longer sought through resemblances as it was in the renaissance understanding of the episteme, it is sought through distinction' (In Steiner 1992, p. 87). As a result, we view the discourses produced within architecture in the sense mentioned by Foucault through their distinctive quality. There is a need for conflict, difference, relations for the discourses for the production of knowledge.

It is also possible to maintain that gathering separated domains of knowledge through the comparative method mentioned above leads to the way of constituting knowledge. According to Cousins (1984, p. 34) the totality of the signs is the corpus of knowledge. What we are trying to do in this study is to gather all the signs together and categorize them in order to make out the kind of knowledge coming out.

After the categorization it is easy to sort out what kind of knowledge is produced by the discourses. Below is the mode of knowledge production:

The Technical Approach:
1. The knowledge of earthquake resistant construction systems and materials, e.g. obtaining good quality concrete; the knowledge of the scope of damage that the earthquake give rise to, design and construction faults, the faults in detailing, wrong geometric configuration; the knowledge of methods of repairing and solidifying; the knowledge about traditional buildings; the knowledge of protecting historical buildings from earthquake, the knowledge about perpetuating cultural heritage.
2. The knowledge of how to make new master plans in relation to the phenomenon of earthquake; the knowledge of the political economy of urbanization and the risk of earthquake.
3. The knowledge of alternative housing; the knowledge of how to realize a permanent building which is very peculiar to the phenomenon of disaster.
4. The knowledge about the nature earthquake, e.g. about seismology, geological structure, tectonics; the knowledge of the earthquake ground studies, the knowledge of earthquake regions map and what to do about it; the knowledge about the history of the earthquakes, e.g. the traces of earthquake in old civilizations.

The Social Approach:
1. The knowledge of the act of architects towards earthquake.
2. The knowledge of the new regulations after the earthquake.

D. THE REPRESENTATIONAL FUNCTION OF THE DISCOURSE

Discourse is a representational practice. That is to say, in Parker's terms, 'discourses bring phenomena into sight, they allow us to see things that are not really there and once an object has been elaborated in a discourse it is difficult not refer to it as it were real' (In Basa, 2000, p. 31).

In our case the object of the discourse is the earthquake disaster. Ideas are the representation of the object, which is the earthquake. In a different approach, it is also possible to say that the authors, mostly the architects or other technical scholars studying about construction and urban planning, represent their idea on the "represented" object through discourses.

Representational power of discourses thus differs from other modes of representations. It does not represent the objects as they are, but realise the representation after merging with other

representations through the effective tools of interpretation and criticism. In this respect, a discourse puts forward signs, represents its object in terms of signs, these signs are our tools of analysis and means of representing order. According to Cousins (1984, p. 33-4), new forms of knowledge can inhabit this different mode of knowing. The sign functions by virtue of its deployment of this representative power. In this sense representations always analyse other representations while they represent them. So according to him, representation is not a mirroring, for the representation is within what is represented. Representation thus always represents another representation. Thus through the function of representation, it is possible to talk about the reproductive aspect of discourse.

The mode of representation is indicated below under our pre-constructed categorization:

The Technical Approach:
1. The representation of the damage caused by earthquake, representation of the earthquake resistant structures, materials, designs, the representation of the idea of the reliability on the traditional buildings
2. The representation of the urban related regulations
3. The representation of the housing proposals, mass housing applications and the representation of their representative power as well

The Social Approach:
1. The representation of the idea of participation, to make society act, transparency, democracy, to be organized.
2. The representation of the legal and the social dimension of the theft of the contractor; representation of the idea of the parallelism of underdevelopment and the earthquake damage and the prevention of knowledge accumulation through political pressure; representation of the idea of the irregularities of the state after the earthquake

4. Conclusion

To sum up, it can be said that this study is a discursive analysis on the functions of discourse. In this sense, it attempted to demonstrate the separated domains of knowledge, in our case the variety of discourses on the earthquake phenomenon could be linked through a discursive element of architecture under the functional aspects. In this course, it is not hard to claim that the discursive effect of architectural discourse on earthquake accomplishes the above-mentioned functions.

Throughout the study, it was important to make a discourse analysis, because the common values and the understanding of the participants of discourse, in this case the understanding of the phenomenon of the disaster, are limited to the discursive practices. As surveyed in the paper, it was not difficult to argue that the formation of the sub-discourses in terms of their scope is not arbitrary, but determined by the overall discourse itself. It is also important to generate an entire understanding on 'disaster' rather than an individual one in terms of a more effective 'circulation, valorisation, attribution and appropriation'[2] of the discourse.

Finally, it is essential to put forward that this study has attempted to reveal some insights that are not self-evident. It was important to demonstrate whether the discourse of architecture, which has been clarified as an active instrument of conveying ideas has paid adequate awareness to the phenomenon of disaster within its structure or not, in terms of qualitative[3] properties. Secondly, putting forward the functions was also resourceful in terms of demonstrating in which field architectural discourses concentrated more on than the others. In this respect, along with the inference of the study, it is possible to assert that architectural discourse establishes its "mega-utterance" on earthquake more in the technical approach rather than the social one in terms of the quantity of the texts, and keeps it in circulation more with the creative function. This consequence is conveyed in Table 1, which indicates the potential of the scope of the texts to function in relation to the above-mentioned roles of a discursive framework.[4] It is also possible to assert that the more function the category of a discourse has, the more it is 'circulated, valorised, attributed, appropriated'. Thirdly, the repetition of a category determines the agenda of architectural discourse. However the reappearance of a theme throughout

[2] The 'circulation, valorisation, attribution, appropriation' are four modes of discourse described by Rabinow (1984, p. 117)
[3] Quantitative approach is found irrelevant for this study.
[4] The ranking is realized by the author in relation to the items identified through each functional item.

the discourse does not denote its importance. One should be critical against a fake reason, and should consider that the importance of a category does not necessarily depend on the quantity of the theme. In this respect, in a comparative approach between the technical and social aspects of the discourse, the technical part seems to have achieved more credit.

Aside from this main inference, it is also necessary to mention that a text might cover more than one function. In this respect, as shown in Table 1, if a text is assumed to constitute new objects, it represents these objects or we can say that it is creative. Also the information provided for the new object can be counted as knowledge. Finally, as a minor consequence, it is also possible to suggest by considering the dates of the texts that architectural discourse does not have a continuous emphasis on the phenomenon of earthquake as disaster, because we observe that the concentration appears at the periods when a disastrous earthquake comes into the scene.

Table 1. The comparative potentials of each categorical sub-discursive element in relation to their functional aspect[5]

	The Creative Function	The Constitutive Function	The Epistemological Function	The Representational Function
Discussing the technical reasons of the damage caused by earthquake	•••	•••	•••	•••
Discussing the phenomenon in terms of the processes of urban planning	•••	•••	•••	•••
The temporary and permanent housing problematic	•••	•••	•••	•••
The informative and historical discourse about the nature of earthquake	•	•	•	•
Discussing the social role of the architect in the disaster	••	••	••	••
The criticism of the politics of the municipalities, and the state as well	••	••	••	••
The influence of the earthquake phenomenon on architectural education	•••	•••	•••	•••

[5] It should be mentioned that this schematic analysis has not been realised through a scientific data evaluation, but rather it is the outcome of the observation of the writer after sorting the scope of the architectural discourse on disaster

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AN UN-NATURAL WORLD: THE DESIGNER AS TOURIST

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Abstract

This paper examines the design researcher through exploring the notion of how design research resembles tourism. The paper characterises the theoretical plane as the Un-Natural World and tells an allegory of the Tourists Journey within it. The aim of this allegory is to show the nature, role and potential of design research within discourse and for the everyday. The paper first looks at the nature of discourse as the formation of patterns, then describes the Un-Natural World, outlines the different kinds of Designer as Tourists and the wellbeing they seek. The paper looks at the Tourist Journey as the process of design research and returning home as solidifying research into the artefact. The paper concludes with a recommendation for not just an ecology of the natural or an ecology of the artificial but also the ecology of the theoretical, suggesting that the design researcher, who spend most of their time travelling through the Un-Natural World, is in a good position to be the guide; to build an outline of the ecology of the theoretical in order to unite the disciplines in a discourse aimed at preventing disaster.

Introduction:

Design research is about dancing with disorder, a formation of patterns out of a dynamic array of possibilities. As Glanville suggests in *Researching Design and Designing Research*, patterns are a human construction (1999:85). To construct patterns of understanding is to create an artificial order out of the natural world, transforming the world out of the natural to form an Un-Natural World. This concept of the Un-Natural World has no physicality, it is the pattern created out of the process of knowing and knowledge; Quine's web of belief or Deleuze and Guattari's rhizomatic network.

This paper considers how, in this virtual landscape of the Un-Natural World, the Designer is a Tourist. We book our tickets to somewhere, guidebook in hand, adding new destinations along the way, and return with something; souvenirs, tales, increased understanding of the diversity of our world, and an ability to reassess the scaffolding of our own constructed world. This allegory explores the Designer as Tourist, a Tourist aided by poly-lingual abilities and a constructivist world view that can enable an ease of travel through many different nations and cultures. The Designer as Tourist, travelling and exploring abroad, can integrate ideas from a vast variety of sources to form an interconnected understanding. This integrative approach has the potential to more effectively deal with the complex issues we face and aid in designing a more sustainable future.

Not all Designers have enough time as Tourists to travel widely or explore fully in order to gain an enriched interconnected understanding. Some are only able to get away for a short time, reliant on their guide and guide book for a swift and enriching trip. When the Designer as Tourist travels to another context, sometimes we seek solace in the similarities until we become adventurous enough to immerse ourselves in the differences. Those that are dependent on their guide book or tourist guide do not see past what is interpreted for them and miss those enriching experiences to be found off the tourist trails. Others are able to take the time to explore and discover their own routes for a unique perspective on the Un-Natural World. The Designer as Tourist who is able to immerse themselves in 'The Journey' is in a good position to re-write the guide book, enabling others an insight into unique perspectives of the Un-Natural World. The design researcher is the fulltime Designer as Tourist. The researcher travels, explores, notices, converses, assimilates, discerns and on returning home recounts their travel stories for the design world. It is the design researcher that has the time to find new routes through the Un-Natural

World and is in a good position to take on the role of tourist guide.

Being a Tourist is about getting away, exploring the new, different and universal, in search of wellbeing. The Designer as Tourist is also motivated by wellbeing, a wellbeing that can be translated into designs for a habitable world. In the contemporary world the notions of wellbeing and sustaining habitability are of critical importance with the potential of looming disasters from climate change and social crises becoming ever more present. This drives the need for the Designer to travel widely through the Un-Natural World in order to find new ways of designing to avert possible disasters.

This paper will examine how design research resembles Tourism and explores its potential to fulfil the needs of the contemporary world.

Patterns:

We exist in a natural world made up of a chaotic interplay of physical objects, spaces, actions and relationships. We simplify our natural world into some kind of order so we may understand it. We construct patterns of understanding so that we are able to act in the world: '[p]attern gives us objects and recognizable behaviours, allowing us to predict, and risk living by our predictions' (Glanville 1999:86). These patterns form the basis for our ideas, thoughts, knowledge, understanding and theory:

> Humans look for patterns... Pattern finding, the making of one concept from many distinct perceptions, is an intensely human activity. Theories are patterns given widespread credence and accepted as accounting for a part of our experience (Glanville 1999:85).

Concepts are formed out of the patterns we determine from our senses. Each pattern outlines a perspective and there are many different perspectives of this existence, many different contexts to make sense of our reality that enable us to act, react, create, disassemble and refashion in a rhythmic motion that sustains us in existence. No one perspective explains the whole of reality, though 'the more eyes, different eyes, we can use to observe one thing, the more complete will our "concept" of this thing, our "objectivity" be'[1] (Nietzsche 1887). These patterns, although abbreviations, enable us to perceive the natural world so that we may act within it.

'Research is an undertaking through which we strive to increase our knowledge (of the world)' (Glanville 1999:81). Research exists within a framework of an interconnecting network of patterns. Ian Stewart talks about this framework as a theoretical landscape in his popular science book *Natures Numbers*. Stewart talks specifically of the universe created by the mathematician's imagination: 'the collective minds of mathematicians has created their own universe' (2001:xii); however this theoretical landscape can be thought of as being created not only by the collective minds of mathematicians but of all thinkers. Fifty years previously mathematician and philosopher Willard Van Orman Quine described this framework as a web of belief:

> 'The totality of our so-called knowledge or beliefs, from the most casual matters of geography and history to the profoundest laws of atomic physics or even of pure mathematics and logic, is a man-made fabric which impinges on experience only along the edges' (Quine 1951:6).

The web of belief suggests our beliefs are connected in such a way that changes to one belief will have repercussions across the web. In more recent times philosophers Deleuze and Guattari describe the interconnecting nature of the framework as a rhizome, a tuber such as an iris, ginger, potato or couchgrass: 'A rhizome as subterranean stem is absolutely different from roots and radicals. Bulbs and tubers are rhizomes' (Deleuze & Guattari 1987 §1). Nodes connect in a non-hierarchical structure growing, not in a linear fashion but from the middle out in many different directions at once:

> Let us summarize the principal characteristics of a rhizome: unlike trees or their roots, the rhizome connects any point to any other point, and its traits are not necessarily linked to traits of the same nature...The rhizome is reducible neither to the one nor the multiple... It is composed not of units but of dimensions, or rather directions in motion. It has neither beginning nor end, but always a middle (milieu) from which it grows and which it overspills (Deleuze & Guttarri 1987:1).

A rhizome spreads under the ground and surfaces as isolated instances although intrinsically part of a multiplicity of other instances, something that anyone who has ever tried to remove couchgrass from their garden would have an innate understanding of. More recently still Bremner (2005:121) argued that this framework is a world in its own right 'Now you are in that [real] world, visiting me spasmodically, you tell me my world actually provides some respite from what you believe to be the excessive reality of your world. When you tell me this, I now think of you as the Tourist.' (2005:121). When Bremner talks about 'My World' he is talking from the view point of the design academic and the world he is referring to is the world of research; the Un-Natural World. Bremner is talking to the design practitioner and thus suggests that when the design practitioner enters the Un-Natural World they are 'the Tourist'. It is from this analogy that this paper will build its allegory.

The Un-Natural World:

The framework of the Un-Natural World is built from perspectives that form patterns of understanding. These patterns interconnect and overlap, coming from a variety of origins in time and space. Some coagulate into conceptual entities that evolve and diversify, others converge in a memetic[2] fashion and others are firmly embedded within this theoretical landscape. These conceptual entities interact, forming relationships with some and isolation from others. It is a diverse, dynamic place with many different languages, cultures and views. This place is spherical in its intentions to comprehend the natural world, though is not made from nature but from the artefact. It is the Un-Natural World. A world of ideas, concepts, thought, knowledge, understanding and theory. Its languages span from poetry to mathematics, with regions of science, humanities and visual arts. Its world views include objectivism, relativism and constructivism with cultural methods that abound.

To consider theory, concept and thought as making up a world then (like our own world) its components would include landscapes, countries, cultures and languages. We could consider disciplines as 'nations' within the Un-Natural World, with associated nations in the same 'region' connected by some kind of commonality like similar world views; such as science being a region including disciplines such as mathematics, biology and chemistry, all having a similar world view of objectivism. Other regions may contain multiple world views and instead have a commonality of language or approach that connect the nations within that region; such as the Humanities where disciplines such as History, Philosophy or Literature may take up any one of many philosophical paradigms; phenomenology, feminism, postmodernism and so on, instead being connected by a similar theoretical tradition. Within the Un-Natural World, 'language' would describe the different forms of communication within the disciplines such as mathematics, visual symbols, prose or poetry, with each nation having their own 'dialect'; the jargon specific to that discipline. Following this analogy the 'landscape' of each nation would be made up of the theories, thoughts and processes that give each discipline form. Together the theoretical landscapes, languages, dialects, customs and world views form an Un-Natural World of which design research is a part.

Within this Un-Natural World design research would be a small, young nation located in a central location surrounded by various other nations. Many of design's thoughts and theories are influenced or derived from a variety of other disciplines and in this way it could be described as sharing a boarder with many of them. Characteristic of small centralised nations (like Holland or Belgium) is their ability to communicate with the different countries around them; often being poly-lingual. Buchannan (2000) talks about the ability of design as a new 'liberal arts'[3] that can not only communicate with the other disciplines but also has the ability to integrate; allowing Designers to travel through other disciplines picking up ideas and integrating them into the fabric of the design nation. This mobility is also aided by design's epistemology; the most common world view in the design nation is constructivism and allows the Designer as Tourist to more easily travel through a multitude of nations being able to understand the cultures derived from both the relativist and objectivist world views. The allegory of Designer as Tourist is based on this mobile ability of the Designer to travel widely in the Un-Natural World as a Tourist.

The Tourist:

When we think of being a Tourist we think of getting away, of taking time away from the incessant deadlines of our everyday activities, of taking our time and investing in

wellbeing. It is about going somewhere else and exploring the similarities and differences that exist there; about finding new perspectives and universal understandings. For this allegory Tourism is about the Journey; a notion of discovery achieved by immersing oneself in both the process and the destinations. If the Journey is a fundamental part of Tourism then some Tourists are more successful at it than others.

This allegory uses a number of popular perceptions of Tourists, judgments formed by people who have travelled themselves or live in a tourist precinct, who form observations of the Tourists around them, including judgments on who is good or bad at being a Tourist and common concepts of what makes an ugly Tourist. The optimum type of Tourist is one that is good at being a Tourist; if Tourism is about the Journey then the 'Good Tourist' is one who engages in the process of travel and immerses themselves in the destination. The 'Bad Tourist' in contrast is one that is less willing to engage in the process of travel and is disinclined to immerse themselves in the destination, preferring to stay inside the luxury resort than venturing into the local district, hence they could be considered as those who are bad (or ineffective) at being a Tourist. The 'Ugly Tourist' is a popular term often used by travellers and locals to describe the culturally insensitive Tourist who is unwilling or unable to immerse themselves in the nuances of the destination, 'any person who shows ignorance, arrogance, and disrespect for another culture while travelling or living abroad' (Lee, 2003). They are characterised as being loud and obnoxious, and many travellers fear turning into the Ugly Tourist. In this allegory these analogies are applied to the Designer as Tourist.

The Designer:

The Designer includes the practitioner, academic, researcher and student (industrial, graphical, architectural, and so on). The Designer enters into the Un-Natural World when researching. Although, as Glanville and Downton suggest, design as an activity can be seen as a kind of research such that the Designer as Tourist accesses the Un-Natural World as part of the design process; when researching, conceptualising and developing their designs, in order to access information and ideas that they then translate into new designs. One could see these visits as Journeys through exotic destinations as a Tourist, so here I will explore the notion of the Designer as Tourist in the Un-Natural World.

The Designer like the Tourist is seeking wellbeing. According to Manzini and Jégou 'the idea of well-being is a social construct: it takes shape over time according to various factors' (2003:39) dependent on what is valued as facilitating and maintaining a positive state of being in the view of a particular time and place. In this context the aim of the Designer is to maintain a habitable world 'a world in which human beings not merely survive but also express and expand their cultural and spiritual possibilities' (Manzini 1992:220) and thus creating wellbeing for its inhabitants. Entering the Un-Natural World is a time for Designers to Journey through the conceptual, accessing different disciplines in order to compile new plans for designing an inhabitable world.

Designers include this touristic quality of research within their design process in as many different ways as there are different types of Tourists. Some design professionals research only briefly (like a weekend away) others such as design researchers spend most of their time travelling and there are many variations in between. Like the Good, Bad and Ugly Tourist, some design uses research effectively, others are ineffective, and others still enter into research without considering the cultural implications.

When in the Un-Natural World the Designer as Tourist is able to travel abroad through many different disciplines. Equipped with a constructivist view the designer believes in both the objectivist's actual reality and the relativist's subjective or socially constructed reality to form a notion that combines the views into the simultaneously objective and subjective; that is to say there may be real things out their to be discovered and understood but we also socially construct our understanding of them. With this view the Designer as Tourist is able to easily cross intellectual boarders, accessing a vast variety of perspectives from many different disciplines (from objectivist disciplines in the Sciences to Relativist disciplines in the humanities) and is able to construct an integrated approach to their travel plans. In this way the effective design researcher has great potential in helping to integrate the Un-Natural World and designing a guide book to the interconnected network of theory that makes up this world.

The Designer as Tourist:

Entering into the Un-Natural World the Designer as Tourist embarks on an exciting Journey of discovery through the diverse array of perspectives that make up this world. For the Designer as Tourist it is a time to 'take time' (Manzini 2000:13) to invest in the generation of wellbeing. To explore; to look and notice the new, different and similar, making notions more tangible about what is already good, what could be better, new ways of doing things, new contexts and understandings to improve quality of life and an increased sense of wellbeing.

The Designer as Tourist can take many different forms, from the Good the Bad and the Ugly.[4] Often the label of 'Tourist' is used to suggest being part of a superficial mass movement for those content with the packaged experience, however these are the worst characteristics of tourism, described by Rapport and Overing as:

> A packaged form of experience in which passivity prevails and contact with the alien and the real is avoided or prevented. Here is a manufactured, emasculated travel, made safe by commercialism. Indifferent to local social reality, 'suntanned destroyers of culture' scavenge the earth intent on new pleasures, content to practise conspicuous consumption (2000:353-354).

This stereotype of superficiality is a notion that is very similar to the stereotype in the design world of 'the style obsessed Designer' (Frayling 1993:3). Rapport and Overing's description, popularly defined as the Ugly Tourist, in this case acts as a warning against a similar Ugly Designer as Tourist. Consider a Designer as Tourist perhaps situated in an R&D[5] position supported by a concept of commondification that focuses on the maximisation of consumption, with disregard for 'local social reality' and culture, seeing the world as a resource to be consumed. I cannot see any wellbeing generated from the Ugly Designer as Tourist, neither for the Designer as Tourist who speeds through their trip following the tourist trails, ticking off sights to be seen, nor for the host culture being consumed, both left exhausted from the experience.[6] The Ugly Designer as Tourist can be seen as seeking a 'product-based wellbeing' (Manzini 2002:141). It is a notion of wellbeing that commodifies and consumes; a sense that the more products consumed the more wellbeing gained, a wellbeing 'of materialising complex services' and 'democratising access to them, producing them in increasing quantities at decreasing prices', of 'individually possessing, showing off and consuming the products' with the freedom 'of choosing between different options and a personalised set of products'. In this idea of wellbeing 'life choices tend to be considered as choices among marketable goods and that, as a consequence, freedom of choosing as coincident with the freedom of buying' (Manzini 2002:141). This consuming Tourist exploits the local resources for their own means without regard for the integrity of local cultures, creating a self-centred sense of wellbeing from having.

It could be considered that what differentiates the Good from the Ugly Designer as Tourist is time, inclination, and support. The Good Designer as Tourist is what Manzini terms the 'off-line designer' (2000:13) a design researcher who exists within a pocket in the momentum of productivity that is 'characterised by a different, slower timing' (14). This Designer as Tourist has the inclination to explore widely, not just within the safety of similarity but is adventurous enough to immerse themselves in the differences in order to find new ways and means. Observing; with the use of experience, emotion, empathy and ethnography, 'characterised by their intent to provide a deep understanding of people through shared experience' (Hanington 2000:66). Engaging with the Un-Natural World using multiple, flexible and creative approaches. Following this description; the Good Designer as Tourist would have an explorative, inquisitive and creative mind willing to immerse themselves in alien languages and cultures to find out something essential and universal. They would actively strive to make connections between the entities that exist within this Un-Natural World in order to find a sense of integrated wholeness. This intent to construct connections could be said to come from an inclination to explore, not sameness, but the complex notion of similarity in difference. The third prerequisite for the Good Designer as Tourist is support, the leisure money to go away, the time to have away or 'off-line' and a belief in the benefits. The Designer as Tourist is endowed with the ability to see the sparkle of light off the ripples on the water and the gargoyles on the top of the GPO[7]. They are able to see things that the locals busily going about their everyday miss. This gives the benefits of insight and the 'time off-line' aides in a refreshment and renewal that adds to wellbeing. The

Good Designer as Tourist gains a 'context-based-wellbeing' (Manzini 2002:145). This is a wellbeing that does not focus on consumption but on the context of life; 'qualities of culture and spirit' (Manzini & Jégou 2003:47), 'common assets'[8](48) and 'contemplative time'[9] (49). It is a wellbeing that comes from a greater sense of belonging, from the time to make connections and form unified resources. The Designer as Tourist seeking context, immerses themselves in the local culture, makes connections and discerns the universal and the local.

In contrast a Bad Designer as Tourist is one that would rather be at home, who at best looks for a home away from home. They are not interested in the new or the different and simply look for the same experience they have in their everyday. Staying at large hotels or resorts serviced by people from their own culture gives them an experience they expect and are used to. The Bad Designer as Tourist seeks an 'access-based wellbeing' (Manzini 2002:142). These Designers as Tourists are turning their attention away from the consumption of products towards the consumption of experiences where the consideration of an immersion in local culture does not enter into their plans. These Designers as Tourists seek a wellbeing constructed out of an ease and frequency of service. They experience not a sense of place but a sense of experience, the quality of which is judged against the similarity to what they are used to:

> Quality of life tends to be related to the quantity and quality of services and experiences which it is possible to have access to (and, consequently, a new idea of freedom intended as freedom of access) (Manzini 2002:141).

Staying within their own language, traditions, culture and world view this kind of Tourist is lulled into a sense of security and pampered by the excess of services available without ever leaving their hotel room or experiencing the new and different. This Designer as Tourist is drawn to sameness[10] and their Journey is driven by 'superficial, 'photogenic' styling' [11] (Jones 1990:17)

There are other distinctions that could be made between different Designers as Tourists; length of time, distance from home and purpose of travel. The purposes of different Designers as Tourists could be categorised by Frayling's three distinctions; 'for', 'of' and 'as'.[12] For this allegory these distinctions could be considered as Tourism for being; those travelling to the beach for a tan, Tourism of being; those travelling to Europe to be part of a family reunion and Tourism as being; those travelling the world as an exploration of self and others. The first is primarily practical, the second is primarily reflective, and the third is an immersion in process. Each of the three purposes for travel have an interested in wellbeing and could be Good, Bad or Ugly. All three purposes for travel are part of the explorative activity of the Designer as Tourist (i.e. research) and can be seen as part of the design process 'a (restricted) design act' (Glanville 1999:81).

There are also characteristic similarities that connect the different forms of Designers as Tourists. For all Designers as Tourists, the act of being a Tourist is intimately connected to the personal identity of the Designer and touring is an integral part of being a Designer; of engaging in the design process. Unlike other disciplines where the researcher is a benign observer, for the Designer as Tourist, the identity of the Designer is always evident in the paths we choose and the plans we make. The Designer as Tourist constructs their own travel plans, where other disciplines may have set procedures, the Designer as Tourist is free to explore and find their own route. The Designer as Tourist utilises intuitive processes to find their way, sampling cultures, using different languages and traditions, finding multiple routes set out by other cultures and ones created from their own. The Designer as Tourist's Journey is not driven so much by purpose but by process, such that even though we may start with a question the process of the Journey ultimately determines the purpose for the travel.

The Journey:

The first thing a Designer as Tourist needs to travel into the Un-Natural World is a ticket, in the form of a question. As the Journey progresses more queries emerge and act as tickets to new routes through the Un-Natural World. Set with the question the voyage begins. Contemporary modes of travel such as the internet, like the jet aircraft, have opened up the Un-Natural World to the Designer as Tourist (and all researchers) making touring a more viable endeavour. Old fashioned modes, like the ocean cruiser or the automobile, are still popular to the Designer as Tourist and may include artefacts such as libraries of books and journals, museums of objects

or galleries of paintings. The modern versions of transport, by far the most popular, have increased the speed and ease of travel; the internet of digital journal and e-newsletters, rapidly opening up the Un-Natural World for the Designer as Tourist. We hop on the internet, set with our question, type in our ticket of key search words, and are transported to our destination, another discipline, another perspective. The Un-Natural World spreads out before us, searching through the options of venues to explore. The Designer as Tourist may, for example, choose the route to the French feminist philosopher Luce Irigaray, exploring different papers finally arriving at one entitled *To Speak is Never Neutral*, and there the Journey begins. On reflecting upon this piece by Irigaray, the Designer as Tourist may become aware of the role their identity plays in their Journey.

Concepts within Irigaray's work[13] highlight the notion that the Designer as Tourist is not 'neutral', they say I, you, we, 'I feel thus. I see such and such a thing. I want or I can do a thing, I affirm that' (Irigaray 2002:2). The Tourist's identity in the natural world (who they are in the realm of the everyday) and Un-Natural World (their identity when theorising or conceptualising) are one and allows for their personal identity to characterise their Journey. The rhythm with which the Designer as Tourist moves through the Un-Natural World is derived from their identity and it is this personalised rhythm that helps determine their momentum and direction through the landscape. This sense of personal identity allows the Designer as Tourist to converse openly within the discourse, bringing a thoroughly human quality and unique perspective to the process. These conversations, between the Designer as Tourist and the discourse of the Un-Natural World, are an iterative process cycling through observation, interpretation, action and back again:

> Of continuous modification and unification, the inclusion of more and more in a coherent whole; occasional re-start, extension, and revolution; the increase in range and of simplification ("Less is more"). From our (re)new(ed) understanding, we suggest how experiment allows us to test our simplification through an interaction in which both we and the personal reality we make for ourselves find confirmation, extension, and modification (and renewal) (Glanville 1999:87).

In this circular process the Designer as Tourist explores the similarities and differences to conceive an overall understanding, changing plans to take a different route to a different theoretical paper, finding the path that takes us further afield to a different discipline and the one that takes us directly to the sight of a particular article, testing our understanding by engaging with the local culture, communicating with researchers from different disciplines, coming away with a better understanding of who we are and how we perceive the world as Designers and as a modern society.

In order for the Designer as Tourist to find their way to an integrated and enriched understanding, their Journey will follow many different paths. Sometimes following paths set out by other disciplines such as the ethnographic methods from anthropology or the path of measured experiments from science or survey from marketing. Sometimes the Designer as Tourist creates their own paths, immersed in context, emotion and creativity (Hanington 2000). Sometimes the Designer as Tourist seeks out routes to special sights within the Un-Natural World which are exemplars of the local culture. The Designer as Tourist explores the extent and nature of the site, reflecting on and discussing its qualities to gain a glimpse into the inner workings of the culture and traditions of the location (Downton 2004:19-20). The Good Designer as Tourist is able to not only travel the well established Tourist paths but also explore the less known routes in order to find their own unique perspective of the Un-Natural World.

During the Journey through the Un-Natural World the Designer as Tourist collects souvenirs along the way; citations, references, bibliographic entries, concepts and quotes. They are the mementoes of discoveries and experiences; they remind us of our trip and are a traditional way of validating our Journey on returning home. When recounting our travel tales the souvenirs help to solidify our ideas into new perspectives and directions, such as a paper on new approaches to design or creating plans for a new piece of design.

Returning Home:

On returning home from the Un-Natural World the Designer as Tourist brings with them the experiences and discoveries of their Journey; back to the natural world and enacted in the

artificial world. To fill in a kind of conceptual solar system, if the theoretical plane is the Un-Natural World there would also be two other worlds associated with it; the natural world of which we are physically part and in which we live our everyday and the artificial world created by exerting our will on nature to form the man-made. These three worlds of the Un-Natural, natural and artificial form a kind of three bodied problem. We know (thanks to Newton) what will happen in a relationship between two bodies, however, adding one more throws the equation into chaos (in the mathematical sense of the term). Three bodied problems are unpredictable (Gribbin 2004:14-17) and it is within this notion that the dancing with disorder becomes apparent. The Designer as Tourist on returning home goes about dealing with the complexities inherent in how these three worlds interact and creates designs that help to bind the three worlds together; the Designer develops the plans for artefacts that helps us act in and conceptualise our natural world.

The Designer as Tourist on returning home has the potential to integrate their understanding of the Un-Natural World into a dynamic travel story that talks of similarity in difference and extracts 'regenerative solutions'[14] (Manzini 2002:145) that help repair the connections throughout the Un-Natural, artificial and natural worlds. The prospect of gaining an increased understanding of diversity and an ability to reassess the scaffolding of design has the possibility of creating designs for an artificial world that will sustain habitability of the natural world and facilitate wellbeing for our existence in it. Hence, put into practice for the everyday the Designer as Tourist contributes to an environment that is healthy, nice friendly and connected with clean air and water, a pleasant surrounding, lively neighbourhood community and a strong connection to the rest of the world (Manzini & Jègou 2003). The hope is that this more holistic view could be more able to deal with the complexities of the contemporary world.

There is a growing need to dance with the disorder of the three bodied problem in order to sustain a habitable world. Journeying through the Un-Natural World can help in the generation of designs for this purpose. The design researcher as the fulltime Designer as Tourist has the potential to help in this process by fulfilling a role of tourist guide helping to direct swift, effective and enriching travel.

Conclusion:

There is time and room in the contemporary world to be idealistic about the potential of design research. As Designers we have a part to play in how we think of, act upon and re-fashion the world. We can choose the current trajectory which will leave us barren and isolated at best or we can choose a different future; a habitable re-connected world with a sense of wellbeing that can sustain us into many future scenarios to come. We can only do this by forming connections between all levels of life; having an ecological view not only of nature but of artefacts[15] and theory. Design research is in a good position to integrate the theoretical (Un-Natural) world:

> Design... could form a fundamental, common ground of intellectual endeavour and communication across the arts, sciences, and technology... an interdisciplinary study accessible to all (Cross 2001:54).[16]

and there is a growing need to do so.

> Without integrative disciplines of understanding, communication, and action, there is little hope of sensibly extending knowledge beyond the library or laboratory in order to serve the purpose of enriching human life (Buchanan 2000:4).

The need is made ever more insistent by the complexities of contemporary issues. Looming disasters such as climate change, social crisis and the need for a sustainable future require an integrated approach. Design researcher as Tourist, is in a good position to write the guide book for the ecology of the 'Un-Natural'. Such an endeavour could help reconnect discourse by dancing with disorder to repair fractures, rebuild connections and establish bridges forming an interconnected whole out of a diversity of parts. With this 'ecology of the theoretical' perhaps as Cross suggests a communication between disciplines could be strengthened through the common ground of design. It seems logical that a combined effort is more effective than isolated instances of designing a discourse against disaster.

Footnotes

[1] Nietzsche uses 'eyes' in this extract to mean perspective seeing.

[2] Memetic comes from the word meme coined by Richard

Dawkins in his book The Selfish Gene to suggest that human concepts evolve in a similar way as genes; popular concepts thrive and diversify where as unpopular ones die out. The term memetic is used by Langrish in Darwinian Design: The Memetic Evolution of Design Ideas.

[3] Buchanan defines Liberal Arts as 'a discipline of thinking that may be shared to some degree by all men and women in their daily lives and is, in turn, mastered by a few people who practice the discipline with distinctive insight and sometimes advance it to new areas of innovative application' (2000:6).

[4] Good, Bad and Ugly are terms not intended as a value judgment but as reflecting popularly terms used to define different types of Tourists. Refer to the explanation under the headings 'The Tourist' and 'The Designer'.

[5] Research and Development (R&D).

[6] The Ugly Designer as Tourist: by no means is this characterisation suggesting that all commercial enterprises conduct such design research, however, I have noticed some instances where practices seem unwilling to invest time, money or support for their Designers to pursue research because they do not see the value. Some practices, while trying to save time, end up wasting it by actively avoiding research.

[7] General Post Office (GPO). The main Sydney post office in Martin Place has gargoyles on it, which after living in Sydney for many years I only noticed after returning from a trip overseas. Still in tourist mode looked at the city I grew up in with tourist eyes, I was amazed what I found.

[8] Common assets: in previous papers Manzini uses the term 'Common Goods' to refer to the same concept. Manzini and Jégou define this concept to mean 'tangible and intangible systems which help create a context and its particular quality, and which by their very nature belong to everybody' they give examples of 'physical assets such as air and water, through social ones such as neighbourhood community or the civic sense of its citizens, to more complex ones such as landscape or urban public space or a sense of security' (2003:48).

[9] Contemplative time: Manzini and Jégou define this concept to mean 'time for 'doing nothing'... or alternatively time in which 'something is done' but by choice slowly. Above all, this expression denotes intervals in time when the flow of targeted or purposeful action is voluntarily broken' (2003:49).

[10] Designers drawn to sameness: this concept comes from notions expressed in Jones' article The Dress of Thought and highlighted in the quote from Trimarchi 'we already have everything that's beautiful in the world and it's all the same' (1990:17).

[11] Superficial, 'photogenic' styling: is from Jones article, The Dress of Thought, where he paraphrases an interview with Manzini (1990).

[12] In the paper Research in Art and Design, Frayling talks about 'research for design', 'research of design' and 'research through design'. Others such as Glanville in Researching Design and Designing Research change the 'through' to 'as'. 'Research as Design' seems to have a more definite meaning and is the reason why I use it in this context.

[13] Irigaray's notion of the researcher not being neutral comes from a discussion on scientists. This acts to emphasize the difference between disciplines and the extent to which the identities of the researcher is utilized within the research process, hence, highlighting the importance the design tradition gives to the role of the Designer's identity in the designs process.

[14] Regenerative Solutions: Manzini describes this concept as 'systems of products and services which have to be endowed with high regenerative potential, i.e. that have to act as positive agents in a process of regeneration of the different qualities of the contexts' (2002:146).

[15] The 'ecology of the artificial' is a concept that is explored in some detail by the Munich Charter and by its signatories including theorists such as Ezio Manzini (1992).

[16] This quote is from Designerly Ways of Knowing: Design Discipline Versus Design Science where Cross is paraphrasing Herbert Simon and although the quote is talking about design science, Cross goes on to discuss how this integrative nature is true for design in general. Bucannon supports this view in his paper Wicked Problems in Design Thinking (2000).

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DEVISING THE PLOT: COMMUNICATING DESIGNERS THINKING THROUGH STORYTELLING

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Abstract

The way practice-centred design researchers use language to communicate their creative practice in an academic context is a problem. In current design research writing, the voice of the practitioner is lost because the relation between thinking and making is not adequately discussed and argued.

This paper shares the results of a small qualitative study aiming to develop an approach to critical writing about designing that draws upon individual thinking practices (i.e. tools, techniques and methods for nurturing individual creativity). Discussion attends to the challenges facing the design researcher when communicating the rhetorical relation between personal, subjective experiences and objective communication of concepts, strategies and operational decisions in design thinking.

In the study, storytelling is used as the means of developing a style of writing that bridges academic writing and visual research; creative thinking and research language; individual creativity and collective communication. As such, the paper asks if the method of storytelling is an effective, efficient and valuable method for communicating practice-centred research to a diverse audience. Through analysis of stories and evaluation of workshop discourses, the paper closes by articulating a series of recommendations for developing a strategy for practice-centred design researchers to communicate their thinking through writing to diverse audiences.

Introduction

Design practitioners usually communicate their thoughts and ideas through product design, as is evidenced in the work of, for example, graphic designers Paul Rand and Wally Olins, textile designer Junichi Arai and Reiko Sudo, fashion designers Hussein Chalayan and Zandra Rhodes, and industrial product designers Tom Kelly and Philip Starck. On the other hand, design researchers often have to communicate in written form. Those who have come from practice and are now engaged in research often find it difficult to articulate the creative thinking processes (i.e. conception & planning, inspiration generation, imaginative development and problem-finding processes) through critical writing.

Thomas Rasmussen, of the Danish Design School (2005) has noted that some research writing in design is often "either sympathetic descriptions of interesting subjects – worthy of scientific investigation – or documentations of successful design processes." It is primarily not, he has argued, 'research writing'. David Durling, Professor of Design, Middlesex University, has also raised the issue of 'quality' in research writing. As a consequence of reviewing abstracts and papers for inclusion in an international conference, he noted during the Design Research Society Symposium, 2005, (15 July, London),

> "[A]bout one third [of submissions] are rejected because they are simply not research. They are sometimes practice with no research context, or a survey with no conclusions, or occasionally just a rant about something held passionately. Another third are lost between accepting the abstracts and reviewing the papers. Either the effort of actually writing is too much, or reviewers find that the aspirations expressed in the abstract are not met in the reality".

Rust, 2001; Rust and Robertson, 2005; Neidderer, Biggs and Ferris, 2006 have all provided guidelines on how written communication could be improved.

Mike Press, Rachel Cooper, Nigel Cross and Steven Heller have all exemplified good research writing relating to practice. Nevertheless, this writing tends to focus on the product of thought rather than on the individual's process and experience. The focus is on design as a problem-solving activity. In contrast, the thinking and hence the writings by practitioners tends to be directed towards problem finding (Buchanan, 1995). Although there have been 'calls' by many design theorists in recent years for designers to resolve this communication issue (Krippendorf, 1998; Margolin, 1998; Buchanan, 2005; Biggs, 2005; Cooper, 2005), the challenge remains.

The problem is being tackled at Duncan of Jordanstone College of Art and Design, University of Dundee. For example, in the work of Wendy Gunn in her Arts and Humanities Research Council funded project 'Learning is Understanding in Practice' (Gunn, 2005), and by Gavin Renwick in his research on 'Postcolonial Aesthetics'. Here he uses stories and storytelling as a means of capturing, communicating and incorporating indigenous knowledge into designs for new Inuit communities (Renwick, 2003). Donna Leishman too, in an ongoing investigation into the interplay between internet based digital narrative, image and interaction, also uses storytelling as a fundamental tenet of her work (Leishman, 2004). In the author's doctoral thesis, 'The Activity of Rhetoric within the Process of a Designers Thinking' (Valentine, 2004), storytelling was the method of integration. The story element took the form of six prefaces where each preface introduced a different discourse. The purpose of each preface was to introduce and acknowledge previous experiences (i.e. events, comments, situations), which had influenced the author's thinking and had therefore affected her decision-making. The use of serendipity, chance and/or the ability to create and use opportunities within the research framework, were acknowledged. Inspirational thinkers who had influenced the author's thinking were also highlighted. The prefaces therefore communicated the values held by the researcher during the design research. They were contextual statements.

This paper aims to provide insight into how one small group of practice-centred design researchers used creative writing and storytelling to extend and communicate the meaning embedded in an artefact, (where artefact is process, product and/or experience).

Storytelling

In this exploratory study, storytelling was the means of developing a style of writing that would bridge academic writing and visual research; creative thinking and research language; individual creativity and collective communication. It was a way of nurturing a discourse about the artefact, investigating new ways of presenting the creation of an artefact as research, and looking at the relationship between text, image and artefact in practice-centred design research.

Stories are an effective means of communication and are one of the oldest forms of conveying information. They can be, for example, entertaining, enlightening and explanatory. People respond to stories; they want to know what happens next: they are innately curious. Stories, discourse and dialogue are also recognized as a means of managing tacit knowledge (Alee, 2003; Gamble & Blackwell, 2001; Tiwana, 2000; Valentine, 2004).

Stories usually follow what happens to one or more characters. The character needs introducing. The context or situation needs setting up. If this is done successfully, the reader will want to know what happens to the character and what the character does. There is an interest and a relevance to the content of the story. In many ways this mimics the act of designing where there is an initial searching for characters, development of understanding of their situation, mapping out of the plot, appreciation of the various points of conflict, linking of the sub-plots and communication of the separate acts within the overall performance. The strength of using storytelling in the research context is that if the designer is sufficiently supported, the reader will want to know how the story and deeds unfold, and the generic significance of the ways of working and the system of thinking through making. Rust and Robertson (2005) in their work on the concept of the Research Exhibition considered the issue of narrative when communicating creative practice in a research context. They posit a combination of text and image as a suitable construct for narrative, advocating 'clarity, appropriateness and relevance' of communication when supporting the audience's interpretation. The role of narrative, including the relationship between text and image where the ambiguous space in between both is considered, must help the viewer to 'understand and evaluate the research'.

It is often suggested that the complexity involved in designing actually defies description due to its richness, and that verbal language holds little to actually enhance such a process. In this study, the issue of complexity was fully acknowledged when communicating through storytelling, the journey or experience of working with the imagination. This was one reason why we agreed a more creative and complex narrative structure was required when using the written word to communicate the open-ended process of designing, and the experience of being a designer.

Research Method

A pilot study was conducted using a group of five designers, all of whom were involved in practice-centred research. They came from the disciplines of printed textile, jewellery and participatory design (and were Marlene Ivey, Hazel White, Frances Stevenson, Jane Keith and Louise Valentine).

Creative writing was chosen as it is a method of communication encouraging exploration, analyses and articulation of creative thinking. It helps to illuminate it. Storytelling, was considered to be an appropriate medium to weave together different strands of designers thought, influence, constraints and challenges, planning, development, production and reception. As Kirby (1991: 3) explains, "...narratives articulate not just isolated acts but whole sequences of events or episodes, thereby placing particular events within a framing context or history."

To ensure each that participant had sufficient knowledge and understanding of storytelling a creative writing workshop was organized. An external consultant who specializes in storytelling and narrative facilitated the workshop. This event provided a forum for discussion, encouraged the group to increase the quantity of their reading and to read unfamiliar genres of text.

Participants were also asked to collect a range of journal articles, academic papers and/or examples of text that provoked them – be it positive or negative provocation. This was to facilitate the sharing of opinion and ideas, to generate their own stories and to strengthen the bond of friendship between them.

The participants worked in pairs whereby each member of the group interviewed a fellow participant, using a common set of open-ended questions relating to the self, and the process of creating and making a piece of visual work. The questions were a starting point from which to begin the process of devising a plot, identifying the central characters and creating a story.

Once the stories were written, a second, final workshop was organised to allow the group to reflect on three issues. Firstly, the writings about their individual thinking process (created by other participant), secondly, on their writings of other designers, and finally, on the methodology used within the study. A telling of the stories was used to facilitate these discourses. The main issues identified were: planning, co-ordination, collegiate framework, time and editing.

Discussion

The five participants selected their partner by picking a name 'out of a hat'. They then proceeded to meet, interview and write their partner's story over a three-month period on the following themes, 'Listen to the Pattern' (by Hazel White), 'Biting Revelations' (by Marlene Ivey), 'Introducing Francis Bacon to Francis Bacon' (by Frances Stevenson), 'Buddies' and 'Moments in Time' (by Louise Valentine, 2006).

The stories in length ranged from 800 – 1500 words, they provided insight into the realities of learning to write a story and the experience of being a designer. For example, in 'Listen to the Pattern', White writes a story of Frances Stevenson's imagination and aspiration of creating textiles for the future:

> "Imagine a fabric, which when touched, crashes like the waves which decorate the cloth's surface, imagine tracing a finger along an undulating line and hearing a scale rise and fall. Frances Stevenson, dreams of 'patterning' cloth with sound.
>
> In Stevenson's textiles, naturally occurring forms and rhythms inform a creative process, which takes pigment and pattern and configures them into an emotional celebration of life. This process results in vibrant works on paper, which become part of rhythmical, iterative process as they are worked and reworked, considering colour, composition and tone, before coming to life as sonic cloth".

In this part of the story, White gives insight into Stevenson's conception and planning of ideas for new work and in doing so allows the reader's imagination to engage in the act of dreaming, visioning. This is achieved through inclusion of the innovation of sonic cloth, in the description of how Stevenson is inspired by nature, and how the emotion engendered by nature is interpreted and translated into textile design. This aspect of the story does not deny the integral characters of subjectivity and emotion and in doing so, nurtures an intimacy between the reader and Stevenson's ideas.

In 'Moments of Time', Valentine writes,

> "Listening to private, personal desires and passions can reveal who we are, who we have become and who we would like to be. One of Hazel's aspirations in life is to travel. Korea, Australia, New York, Barcelona and Shetland are places, spaces and cultures, which are rich in intrigue for her. She views travelling as a way of exploring what it means to be Hazel White at a new moment in time. It offers two pathways: the independent traveller where adventure and personal experience is primary, and the co-dependant traveller where shared experiences are the essence. Irrespective of which pathway is embarked upon, the experience of travelling to other countries or new parts of one's home country ultimately adds to the repertoire of visual, emotional and linguistic references, which she can draw upon when engaged in creative thinking."

Valentine captures qualities of White's character and explains the significance of 'travelling' in terms of developing a visual and cultural knowledge bank, from which tacit knowledge can be accessed. On one level, this aspect of the story reads as a piece of journalistic text and on another, a theoretical construct. It implicitly informs the reader of Hazel's approach to one aspect of practice, the process of 'feeding the mind' and how travelling is an important way of doing this. The difficulty with this piece of Valentine's writing is that on its own, it would not offer the viewer sufficient support when looking at White's artefacts. A willingness to allow the personal to inform the narrative is a necessary condition for the storytelling approach to work. But injecting the 'personal' is difficult when communicating someone else's practice as a subjective interpretation of a subjective topic results.

One of the groups' concerns perhaps fears, lay with their perception of what they 'ought' to be doing as narrators and what would consitute a narrative: what was the 'right' way to approach developing a tool for supporting written communication of practice-centred design research? How would our work (method) be compared with other research writing?

Despite these anxieties, we were also aware that 'academic convention' for practiced centred research in the visual disciplines (for example, design, art and drama) remains a 'work in progress' – a new form of research requiring further investigation: a practice heavily supportive of uncertain situations, where ambiguity is a fundamental tenet of the act, and subjectivity or tacit knowledge a necessary characteristic.

The initial workshop conversations, for example, ranged from intense criticism of the dry, impersonal academic approach of much research writing, to also favouring the objectivity and evidential substantiation found in much of the same writings. The participants criticised their own prior efforts for side stepping the issue and for failing to contribute to the ongoing discourse. The conversations also reflected on the knowledge and experience gained from attending and participating in design research conferences between 1995-2005. (The Doctoral Education in Design conferences, Ohio, 1998 and Arizona, 2005; the European Academy of Design conferences in 2001, 2003 and 2005, and the Design Research Society conferences, specifically Common Ground, 2002). In doing so, the issue of design research writings in practice-centred investigations were considered.

Evaluation

Quality writing requires quality time and care to be given to the task. The participants in this study were British practice-centred design researchers employed on a mixture of part-time and full-time contracts by the respective Higher Educational Institution. Irrespective of their contract type, they were committed to a remit that, more often than not, required them to juggle heavy teaching and learning, administration, research and/or professional practice on a weekly basis. Subsequently, the amount of time invested in creating each story was variable, ranging from two to seven days. Participants rarely devoted consecutive days to the task.

The stories were created over a thee-month period. This was partly due to external academic commitments and the level of intense concentration that inherently comes with learning a new skill.

Editing of the stories took up a significant proportion of each participant's total time and clearly contributes to quality writing. Nevertheless it was agreed that an insufficient amount of time had been invested in this part of the process. The main concern had been to complete a story. The volume of words was not an indicator of the amount of time given to the task, nor to the success of a story (in relation to the study objectives). Ivey, for example, commented on the significance of editing a new form of narrative, noting that,

> "Although our research culture is configured to give us time and opportunity to develop our research writing skills, I realise that we have no provision that might allow us to reflect/build a writing style for the discipline. If 'design has it's own way of doing things' [as intimated at *Wonderground*, 2006], might it not also be distinctive in communicating what it does?"

The participants agreed that the editing phase of storytelling, which involves appraisal, critique and refinement, required a greater investment. Time had permitted the creation of a story with a beginning, middle and end, but had not been followed by the crucial process of editing. The participants agreed that the process of editing was an iterative process that opened-up new ideas as well as closing others down. It was seen as open-ended and therefore did not have an absolute point of 'closure'. Further development of the editing phase offered a way of achieving 'creative rigour' and of communicating a critical narrative that supported the designer's creative thinking.

It was clear to all participants that 'thinking' for research precedes 'writing', and writing type or style is the outcome of research 'type'. It was also understood that the act of 'reading' for research precedes 'thinking' which precedes 'writing'. As such, the study considered reading as a principal determinant of the quality of writing. A small dossier of reading material was collected as a result of this but what was most significant was the collegiate nature of the group. In many ways the product or outcome of the dossier task was secondary and the process and experience primary. As Stevenson expressed: "working as a team and discussing problems / difficulties openly, helped to alleviate anxiety when writing". Sharing knowledge and experience of different writing styles and genres of writing was cited as a valuable means of building trust between the group in a short space of time.

The high level of commitment and enthusiasm given by every member of the group and that the level of achievement experienced was an agreed feature of the work. Progress was individual and therefore communicated in various ways. Each participant agreed the study had facilitated a more relaxed and confident approach to research writing. It provided a structured style to narration that supported communication of the self and individual creative practice. Stevenson commented that the pilot study "was a learning curve that started as a difficult challenge and ended up as a liberating experience". Ivey's summation articulates the essence of why there was positive momentum during and after the study,

> "This project was a very well co-ordinated, innovative, effective, social and interesting method for, a) becoming acquainted with the research/practice of colleague(s) in time deprived scenarios, and b) providing focus for a pluralistic discourse in the subject area – thinking, saying, doing and making design research writing".

The study helped illuminate how researchers could support one another in their quest for authentic communication of their thinking and the generation of a new kind of design research writing. However, writing stories and sharing the experience and outcome of the project was insufficient in itself to ascertain whether the project was successful in terms of its aim. The issue of exhibiting the stories alongside artefacts from each participant's design research practice was considered a necessary future action with Ivey noting this as a meaningful way in which to fully evaluate the method of storytelling and critically comment on storytelling as an effective and efficient tool for design research writings. She noted the "...most interesting for me ... were the connections that arose between exhibiting design research and design research writing and the methods that might be used to create well co-ordinated, innovative, effective, social and interesting interfaces between research and audience - whomever they are."

Conclusion

As design researchers, we have a shared responsibility to continually build our research capacity. This project was intended to support this objective by substantially increasing the confidence and ability of young researchers to capture their thought processes, articulate this deeply hidden process and write-up practice-centred research.

The following recommendations are intended as an aide to developing a strategy for writing and communicating practice-centred design research. They are an outcome of the pilot study and will provide a springboard for future research in this area:

• Ensure adequate investment (intellectually and financially) is given to storytelling. The researchers must be given adequate time and 'space' to think, not just to 'do'.

• Develop the idea of the 'dossier' to include examples of texts from authors who write about how writers use themselves thoroughly in creating stories should be referred to; writings that demonstrate how this technique is not concerned with autobiography, but with authenticity.

• Widen the contextual reading on the subject of storytelling to include research from ethnographic studies in a range of disciplines.

• Extend the period of story creation and incorporate more intensive creative writing workshops perhaps considering a bespoke residential creative writing package, at the beginning and end of the storytelling task.

• Use collegiate methods, for example, the 'buddy' system as it promotes knowledge transfer, builds trust and engenders dialogue, which collectively increases individual and team confidence.

In addition, the following are worth further consideration:

• Consider mounting an exposition of the study to demonstrate the use of storytelling to illuminate the thinking behind creative design practice, and to further evaluate the results in terms of audience understanding.

• Evaluate the exposition (artefact and stories) with a group of researchers from a diversity of disciplines to appreciate the range of interpretation and the degree to which storytelling deepens understanding of embedded knowledge and creative thinking in design research.

• Incorporate a range of simple creative writing techniques that will nurture a willingness (on the part of the narrator) to allow the personal to inform the writing process, as this is a necessary condition for the storytelling approach to work.

As a consequence of this pilot study there is an increased confidence to communicate research, and greater collaboration was engendered across the different specialist boundaries. The project cannot claim to be solely responsible for the new collaborative partnerships that the participants are now involved in. However, there is some evidence that the potential for multi and cross-disciplinary research projects undertaken, completed and successfully disseminated increased as a result.

Biography

Dr Louise Valentine is a Design Lecturer and AHRC Postdoctoral Research Fellow, in the School of Design, University of Dundee. She manages a multi-disciplinary research team investigating, 'Past, Present and Future Craft Practice', has published in the area of visual thinking, intuition, mindfulness and rhetoric, and supervises a number of PhDs in the craft disciplines. Valentine also has responsibility for development of a new interdisciplinary/inter-university postgraduate programme entitled, 'Capitalising on Creativity' which synthesises creative and management practice.

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DESIGN REDUX

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Abstract

Many designers and design academics are exploring ways of responding to the contemporary challenge of sustainability in their approaches to the creation of a meaningful and responsible material culture. A significant issue in this debate is that of profligate waste, especially in electronic products. This paper provides an overview of some significant current trends in digital design, music, theatre and product design in order to develop a basis for design engagement. Several design examples, developed by the author, illustrate an approach that emphasizes product re-use, recontextualization and localization for evolving a more sustainable rendition of functional objects. The examples combine discarded and low-value products with locally achievable components to create 'mash up' objects that have been termed here "Design Redux". These design examples are considered in relation to product value and it is demonstrated that such designs can draw upon various, interrelated aspects of 'value' in order to restore their useful life.

Introduction

Changes are occurring in design. We are witnessing a flourishing of diversity, complexity, playfulness, energy and freshness. These developments are happening for a variety of reasons – economic, environmental, moral and ideological. Within an information-rich global milieu these new directions are being informed and influenced by many sources, and individual designers can make their work known to a very wide audience. The reasons, the approaches and the outcomes are numerous and varied but, collectively, many of these directions indicate a burgeoning of creativity coupled with a new democratization of ideas and often a heightened sense of responsibility.

However, these changes are not happening within mainstream industrial design, which seems largely out-of-touch with such developments. It may be that industrial design has been part of the corporate leviathan for so long that it is no longer able to flex its creative muscles and, unused, they have atrophied. Even where the contribution of industrial design has been most successful, in companies such as Apple and Dyson, the design contribution, while certainly accomplished, remains essentially conservative in character. In contrast, many contemporary directions outside the mainstream are indicative of a quite different sensibility. The most notable work challenges the pre-packaged homogeneity that mass-manufacturing presents as a *fait accompli*, but which relegates us to passive consumers with little opportunity for deeper understanding or involvement. The new design is often more enabling, more approachable, more expressive and, consequently, more engaging. Tellingly, it can often be characterized by words prefixed by 're' - responding, restoring, recovering, remixing, recycling, reusing, reducing. It may even be about redemption. This design work may be recent, but the question it addresses is not. Implicitly, much of this work is an attempt by designers to suggest an answer to the question, 'How can we live decently?' It is the same question that Balzac asked over a century ago (Gopnik, 2004) and which many others have asked before and since.

This type of design requires a rather different process than has been prevalent in design schools for many years. The standard 'representational' approaches, whether paper-based or computer-based, become secondary – there is a greater emphasis on intuitive, hands-on, tactile, physical and reciprocal methods that respond to the world as it is. Recalling the creative flourish during the early decades of the twentieth

century, they involve collage, assemblage, and bricolage, and, where deemed appropriate, these are used in combination with the latest technologies to provide new design possibilities. Significantly, these approaches often make use of pre-existing objects in ways that are not only stimulating and aesthetically inspiring, but also attendant to new sensibilities and new responsibilities related to social equity and the environment. Here, I discuss several of these new directions with respect to contemporary environmental and socio-cultural concerns. However, to develop a more comprehensive appreciation of the process and the conceptual differences between these emerging directions and products of conventional industrial design and mass-production, it is useful to actually engage in the process of designing. Therefore, several examples have been developed that explore ways of incorporating pre-existing products in new functional designs. The process of design engagement, and reflecting on the artifacts it yields, allows for a deeper understanding of the design decisions, and the potential contributions these new directions can make to our contemporary ideas of material culture.

Appreciation

The morning I sat down to write this paper I received an e-mail from a colleague who had just returned from a visit to India. He wrote, *"I agree with what all great minds have said: one never comes back the same. I actually struggled with what I would say when asked 'how was India?' ... I came back feeling more blessed than ever – content with what I have, and no longer desiring what I don't have (that is the most significant change) – a gift I did not expect."* (Boulanger, 2006) Only the previous evening, when I had been making notes to structure this paper, I had at one point written prominently across the page, *"Appreciate – what we already have"*. Implicitly, this is a significant aspect of many of the emerging directions in design, which draw upon sources that are already present within the human-made environment – the capacity that exists at the local level, as well as the unvalued detritus or forgotten productions of modern society. The Sear's Style project and the Salvation series (Boym, 2002, 28-37, 56-61) and the *Multidao*, *Banquette* and *Alligator* chairs of the Campana brothers, which use soft toys, such as dolls and animals, as the cushioning and upholstery (Campana and Campana, 2004) are examples of this design approach. They contrast starkly with conventional mass-production methods that make heavy use of virgin resources and which, among other things, have such detrimental environmental consequences.

Being content with what we have seems to be something of a rarity in modern society. This is not only strange and rather sad, it is also profligate and deeply damaging. The culture of dissatisfaction that pervades the richest countries in the world is a key driver of consumerism and a critical component of our current notions of wealth creation. It is also a major contributor to environmental destruction and runs contrary to meaningful understandings of sufficiency and of human happiness (see note 1). The imaginative directions that are emerging in contemporary design indicate that some designers are wrestling with these issues and attempting to reconcile ethical and environmental concerns within their creative endeavours. The results suggest a trajectory for design that can help reduce some of the negative consequence of consumerism and allow a re-valuing of what we already have, while also contributing to economic wellbeing.

Design Redux

The term 'redux' was used by film director Francis Ford Coppola in 2001 when he released a newly edited version of his 1979 film, Apocalypse Now; in this later edition, 'Redux' was added to the title. The term, which has its origins in the 17th century, means 'bring back' or 'restore'. Coppola used it to re-present his film to a new audience, as well as to those who had seen the original version. The longer 2001 version included substantial sections of previously unseen footage, which provided a useful basis for re-marketing a significant film that was, at the time of the new release, 22 years old. Some might criticise this as a cynical way of making money from an old movie, but it is can also be seen as an opportunity for re-appreciating what we already have, while also generating economic activity.

The production of consumer goods, like film-making, requires ideas and efforts by many people, as well as materials and energy resources and, inevitably, a certain amount of waste, pollution and environmental damage will occur. Thus, by re-presenting and re-valuing older productions, be they films or products, we restore and re-acknowledge them as contributions to human culture. We also acknowledge the creativity, work, resources and environmental costs that have already occurred in the course

of their production. In other words, we show appreciation and demonstrate respect. When income generation and aesthetic and/or technological upgrading is included, potentially, it becomes possible to create meaningful, creative work and contribute to economic interests, while simultaneously moderating both our use of materials and energy and their associated environmental effects.

Designer Jurgen Bey has taken old chairs and re-covered them in glass reinforced Polyester (Ramakers and Bakker, 2004, 32-33). In another design, he envelopes an old chandelier in a cylinder of two-way mirror foil (Droogdesign, 1999). In both these designs, older products are restored to use, made contemporary and re-appreciated. New materials are used, yes, but in relatively small quantities. In these examples, the objects have to be carefully selected. This is true too, of the Bootleg series by Wolf, Bader and Oschtz – where admired 'classic' designs of music equipment, that retain a certain 'design' cachet, have been modified to play MP3 files (Ramakers and Bakker, 2004, 34).

The approach I take here is rather different. It is an attempt to appreciate, or re-appreciate still-functioning products that are no longer valued; those products that are so readily discarded and replaced by newer versions which are aesthetically more up to date and which may have minor technical advances. These products, which are perhaps 10 to 20 years old, have no 'design' cachet and therefore generally find their way to landfill. In addition, the focus is on electrical and electronic goods because these are especially problematic in terms of their environmental consequences (WEEE, 2002/03). Through discussion and designed examples, the approach illustrates a potentially constructive direction for addressing sustainable concerns within our contemporary and evolving conceptions of material culture.

General Considerations for Design

In developing new approaches to design, the saying, "everyone is smarter than anyone" referred to recently by Brian Eno (Eno, 2006), is pertinent. When many people contribute, the results of our endeavours can often be significant and surprising. Today, this idea is being facilitated by the internet where projects such a the online encyclopaedia, Wikipedia (Wikipedia, 2006), the Linux open source operating system (Linux, 2006), and a development known as Mash Up (see Note 2) are offering new kinds of solutions and new opportunities for creativity. Often these solutions can be contributed to, updated and improved by hundreds of people all over the world. In some cases, these developments utilize pre-existing resources which are simply re-assembled in new ways. While these phenomena are challenging our conventional notions of authorship and intellectual property, they can also make possible a productive and creative evolution of ideas. Eno has also given the example of researchers who place their academic papers on the internet – to be aired to the scholarly community, improved upon and added to by others, as an alternative to the more conventional journal publication where there are perhaps one or two authors (Eno, 2006). These recent practices have strong parallels with much more ancient traditions. For example, the stories, mythologies and histories kept alive in oral cultures became compelling, intricate and profound because they were allowed to evolve over time, were contributed to by many, and in the process accumulated layers of meaning and complexity. We just have to think of the many stories from the oral tradition to see that this is the case. These stories, such as the fables attributed to Aesop, the Thousand and One Nights, and the Odyssey, have stood the test of time and are still appreciated today. In a somewhat similar vein, Manzini and Jegou have developed 'Enabling Solutions', which offer a method for developing viable, affordable and desirable services at the local level and in the process, they engage people and community (Manzini and Jegou, 2003). However, in mainstream product design, practices that encourage local engagement and facilitate this kind of design evolution are far less apparent.

The example used by Thackara, of *Canto Ostinato,* is useful in indicating a way forward for design (Thackara, 2005, 211). Unlike conventional musical compositions, this piece for four pianos is far more loosely defined. The composer provides a basic structure, an idea in the form of an incomplete score. Each performance will be different because it is affected by place, audience, and the players' interpretation.

When we consider these various examples in the context of design, collectively they suggest a way forward that not only challenges many of our assumptions about the role

of the designer, but they also offer a constructive path for incorporating sustainable concerns. Firstly, they challenge our notions of authorship. The conventional idea that the 'designer' is the primary influence in defining the nature and appearance of products is less important here. Secondly, the contemporary norm of large companies producing virtually identical mass-produced products for wide distribution, and with little, if any, long term responsibility for the product, is questioned. Instead, a direction is suggested that allows a continual and dynamic approach to making, adapting, recovering, restoring, re-interpreting, re-making and re-presenting; an approach that is contingent on locale, cultural preferences, local materials and skills, and local engagement. Such an approach also enables the priorities of sustainability to be more easily embedded into our conceptions of material culture and it helps to transcend a culture in which people become mere passive consumers of pre-packed products. Instead, material culture becomes the beneficiary of the diversity and input of many voices, which not only enables us to more effectively address the many issues of concern surrounding contemporary product production, but could also lead to a more intimate, interesting and preferred rendition of functional objects. Within such an approach, mass-production has a vital role to play. However, the dominance of mass-production, in producing complete, inviolable products for mass-consumption is challenged. Moreover, these new directions in design suggest that it may be possible to bridge the chasm that has grown between traditional craft design and industrial production, a chasm that emerged during the late 19th century when these two important approaches to production went their separate ways.

The key to progressing such approaches in the field of product design seems to be the development of a way forward that enables input and engagement at the local level. Like the examples referred to above, a starting point has to be developed that provides an idea, and a basic structure. This must be defined rather loosely, so as to enable flexible interpretation and engagement, at a level that is appropriate to the local input. In addition, it must allow for the benefits and contribution that mass-production can offer, because it has to be recognised that not everything can achieved locally. In terms of sustainability, in order to moderate waste and reliance on new resources, and to provide a basis for rethinking material culture such an approach would also have to be able to address the hundreds of products that are regularly discarded. These discarded products can provide a useful starting point for considering a different path for design and provide one way of addressing Thackara's suggestion of closing the loops in the flow of materials and energy at the local level (Thackara, 2005, 226).

A Design Approach – an example

In developing a way forward to address these ideas, an attempt has been made to utilize discarded, un-valued objects. Particular emphasis is placed on electronic goods as these become aesthetically and/or technically outdated especially quickly and are creating a severe problem in terms of disposal. For example, in Canada over 272,000 tonnes of computers, phones, TVs, stereos, small appliances and other electronic waste go to landfill each year (Natural Resources Canada, 2006). However, a design approach that attempts to incorporate discarded electronic objects in new design solutions, and to do so in such a way as to include local input, faces several significant challenges.

Firstly, a standardized approach is not possible because of the sheer variety and unpredictability of these discarded 'source' materials.

Secondly, it seems propitious to develop an approach that avoids the need for product disassembly that would break down the products into their component parts. To do this would be time consuming and expensive, and would inevitably create waste. It would also require sophisticated and expensive technical expertise in order to find new uses for these components. An alternative is to use the products as they are and, through design, offer opportunities for them to be re-valued. This is also in accord with the first two and most important of the three R's i.e. Reduce and Reuse, only after that option is attempted should we consider Recycling.

Thirdly, local engagement and input would be facilitated by devising an approach that requires little in the way of capital investment, but rather makes use of relatively low-tech and/or inexpensive methods to achieve new design solutions.

Lastly, the design challenge here is not to prescribe a stepwise method, nor to develop a finished product (except for

purposes of illustration) but to provide enough of a structure or idea that will allow people at the local level to create finished designs that are contingent, infinitely variable, dependent on context, attendant to notions of reduction, moderation and appreciation, and which can ameliorate, in many small ways, the problems associated with disposal and waste. Such a direction would not only enable new renditions of functional objects to be developed and environmental issues to be addressed, it could also serve the community by providing locally available, creative work and local opportunities for product re-use, re-production, repair and recovery.

These considerations are consistent with Thackara's seven design frameworks of, sense & respond; deep context; seeding edge effects; smart recombination; social fiction; designing with us; and design as service (Thackara, 213). The phenomenon of 'remix', which is also an aspect of Mash Up, (see above) in contemporary music has somewhat similar characteristics to this type of design approach, where segments of pre-existing music or speech are put together in creative combinations, and sometimes added to, to create new musical works. Older, perhaps forgotten, songs and videos are fused together into a new whole and, through this process, they can be appreciated by a new audience. An example of Mash-up in music is a recent production of Beatles music for the Canada-based circus theatre company Cirque du Soleil. Here, the original music is put together in new combinations, 'mashed up', added to with new composition, speeded up, slowed down and reversed (Martin and Martin, 2006). The result is a fresh, contemporary rendition of very familiar music. Similar developments are affecting other areas of human creativity. Scripts of old plays are being manipulated, edited and new material is being added to create radically new creations that are relevant to a contemporary audience. For example, a play at the Hampstead Theatre in London, entitled Faustus, combined parts of Christopher Marlowe's Doctor Faustus, written in the 16th century, with material from the 2003 'Insult to Injury' project by contemporary British artists, the Chapman brothers (Haydon, 2006).

In such approaches, the pre-existing, human-made environment is 'mined' for resources, which then form the material for new creations. This constant borrowing, appropriation and re-use, across many fields, is a growing characteristic of our time. It challenges our conventions, because there is often less concern with traditional boundaries and established notions of attribution. In previous times, the resources of the natural world were 'harvested' at will, without too much regard for consequences, but today, such methods are becoming increasingly difficult to justify. It therefore seems appropriate, and more consistent with sustainable principles, to consider the discarded and forgotten products of modern society, and to draw on these as a basis for creating new design opportunities.

Process

To address the challenges poses by 'the local' it is necessary to adopt a design process that is flexible and responsive to the diversity that exists at the small, particular, local level and within those areas that are immediate, physical and cognitive. Planning ahead, with fixed ideas, becomes an obstacle. It is important to allow a more intuitive process that attempts to relate a plethora of complex, interdependent 'background' ideas and understandings about products, the environment, people and function. The result of this way of working is, in any singular design example, imperfect and partial – to which we can respond again, using it as a basis for reflection, and move to the next attempt, which will be informed by new ideas suggested by the previous piece, together with other ideas from readings, observations and further reflection. Whether or not such a process is considered valid, depends on what we are attempting to achieve, and on the criteria we use to validate. However, it is an approach that is modest and deeply grounded in an interdependent relationship between the rational and the intuitive, and the functional and the aesthetic; and this much more so, in my view, than the more removed, large-scale, rationalized approaches to product design and production that tend to dominate our culture. This smaller, more local, and more direct approach draws upon tacit knowledge, responds directly to local conditions, can yield solutions that address sustainable concerns, and can contribute to the development of a more varied and potentially more desirable rendition of functional objects.

'Harvesting' the Discarded

The intention in this design exercise was to explore ways of re-using discarded products that could be found locally. In addition, it was necessary to effect such re-use in a manner that was suited to local scale, and which would provide a feasible

basis or template for adoption and adaptation by others, in other locales. For the reasons outlined earlier, emphasis was placed on the re-use of objects, with little or no modification, rather than on disassembly. Consideration was given to the nature and form of local input, as well as to the incorporation of new components or products that would enable the discarded products to have a new life in an acceptable manner. In summary, a design approach was required that:

– would make use of locally available, old, otherwise discarded, unwanted products.
– can be achieved locally.
– is highly flexible in its ability to incorporate a wide variety of products or product combinations.
– enables people at the local level to develop design variations that appeal to their own tastes, reflect aesthetic preferences or that reflect cultural preferences.
– retrieves, re-uses, re-appreciates, and re-presents objects in ways that are useful and desirable.
– contributes to the moderation of waste and the requirement and desire for 'new' objects.

A Locally Enabling Proposition

As was mentioned earlier, a feasible way forward depends on the development of an idea or basic structure that allows pre-existing objects to be incorporated in new designs, while also enabling achievable input and engagement at the local level. In the following examples, this basic structure centres on the notion of a simple, locally produced 'frame' that provides the foundation for a new functional composition. The use of a frame stems from earlier work that looked at issues such as product form (Walker, 2006, 139-166) and ephemerality. Here, it is used again but for different reasons. The frame allows the incorporation of discarded, but still functional products, together with additional elements, within a new, locally produced composition. The frame serves a number of purposes that collectively allow previously rejected objects to be seen and valued anew.

Chapman has suggested that for people to maintain a prolonged engagement with functional products, designers should explore ways of that support continued growth and evolution; to re-fashion the interaction in order to facilitate an ongoing relationship (Chapman, 2005, 186). The 'frame' proposed here is one example of how this might be achieved. Essentially, it serves as an enabling device that allows the user to see the object as an element within a newly defined, discrete and particular context. In effect, the frame separates the object from its surroundings and places it within a specially designed composition. In doing so, the discarded object becomes one element within this new composition and, in the process, it becomes re-contextualized. The discarded object becomes an essential compositional constituent which contributes essentially and materially to the functional whole. In addition, the intrinsic qualities of the object, i.e. its outdated aesthetic qualities – its form, its colours, its worn or damaged surfaces, become essential qualitative characteristics of this new whole.

Within this separated frame, individual elements and the entire composition can diverge considerably from our usual ideas of what is appealing and tasteful – and yet can still be regarded as having aesthetic appeal. The intentional separation from the surroundings, through the use of the frame, suggests that this can indeed be the case. Thus, the use of the frame appears to effectively enable a wide variety of objects to be used again. At this point, it is relevant to note that mass-produced consumer products are designed to be used within a broad range of domestic contexts. However, as particular products age, they become increasingly undesirable, often because they are regarded as no longer appropriate or pleasing within their specific context of use. Products are associated with social standing and personal expression and so, as objects become old and shabby, they are replaced. The re-presentation of objects within a specifically defined context offers one example of how older, perhaps deteriorated products, can be re-appreciated. The frame serves a similar purpose to the rarefied context of the white cube art gallery. Both have the effect of elevating the objects or art pieces. While some artists regard this as inappropriate and challenge it in their work (Veiteburg, 2005), perhaps it is exactly what is needed in the case of lowly and otherwise discarded consumer products because it allows them to be re-noticed, re-used and re-valued.

Thus, the frame is a way of addressing, through design, a sustained engagement with objects. It offers one approach to building more sustainable narratives and an alternative to the "box fresh" ideal of newness so prevalent in contemporary culture (Chapman, 111, 132).

As a locally achievable, sustainable solution, the frame:

– can be built in a simple workshop using a variety of readily available materials such as softwoods and sheet stock (MDF, plywood etc.).
– its dimensions are variable and can be specified to suit a wide diversity of locally available discarded objects and other compositional elements.
– provides a foundation for the application of many different finishes to suit local preferences, as well as finishes tailored to be compatible with the compositional components.
– provides an easily changeable foundation for the composition itself, and allows for the integration of locally available mass-produced and locally-produced elements, as well as the combination of new elements with old.
– facilitates reduction, re-use, and recovery through aesthetically varied, locally created and potentially desirable design solutions.
– offers a means for re-using products in a potentially cost effective, locally appropriate manner.
– offers a means for developing local employment that could reduce electronic waste while providing highly creative work opportunities.

Thus, the frame concept appears to be an effective, locally enabling device that provides a basis for exploring sustainable solutions. It is not prescriptive, but provides a highly flexible basis for local interpretation and for a wide variety of design solutions.

A number of examples have been created to illustrate the idea. *Winelight* (Figure 1) is a wall sconce comprising three re-used wine bottles combined with new, off-the-shelf electrical parts and mounted on a white frame with shelf constructed from pine and MDF. *RePlay* (Figure 2) combines a 1980's vintage cassette/radio with a new MP3 player, again mounted on a locally produced white frame with shelf. *ReCast* (Figure 3) uses a 1970's vintage radio as the speaker output for an I-Pod – in this case the frame was finished in a patterned wallpaper and other elements are added to complete the functional composition – this example also explores notions of taste and compared to the earlier examples, illustrates that the basic frame device allows for a variety of aesthetic possibilities. *ReCall* (Figure 4), a re-presentation of a 1980s wall phone uses the 'canvas' of the frame as a basis for re-contextualising the 'discarded' object – in this case with a painted background and the addition of elements that are suggestive of a somewhat institutional, rather than domestic, context.

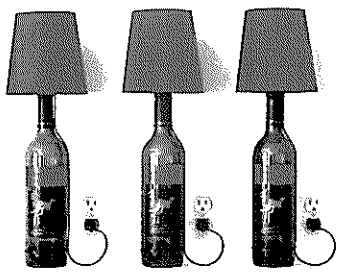


Figure 1. WineLight, re-used bottles, new electrical fittings, shades and low-energy bulbs mounted on a locally-made white frame with shelf (MDF and pine).

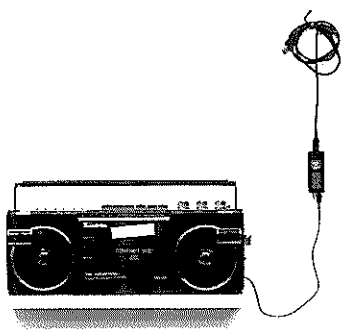


Figure 2. RePlay, re-used 1980s cassette player, new MP3 player, mounted on a locally-made white frame with shelf (MDF and pine).



Figure 3. ReCast, re-used 1970s radio, new I-Pod, mounted on a locally-made frame (MDF and pine) with vintage wallpaper and shelf finished in wood-grain adhesive plastic film.

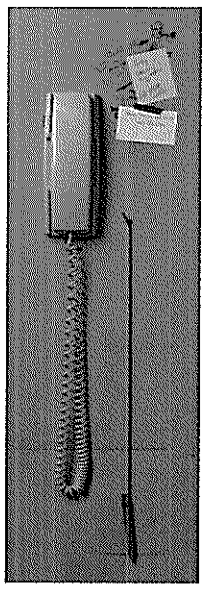


Figure 4. ReCall - re-used 1980s telephone, mounted on a locally-made frame (MDF and pine) with latex paint finish, doodles, notes and pencil on cord.

Re-Valuing Objects

Walker. and Chaplin (1997, 165-166) have distinguished several kinds of value that can be attributed to an artefact:

– *Artistic value* – intrinsic excellence, aesthetic quality, significant content.
– *Use value* – practical function irrespective of appearance and aesthetic attributes ("use" value can also include decorative, symbolic, memorial, ideological and political value.)
– *Sentimental value* – private, biographical and emotional life of an individual.
– *Exchange value* – monetary value is variable because of fluctuations in the market and the economy.

In several of the re-used artefacts presented here, the original value would have been primarily their use value, coupled with their 'newness' – i.e. aesthetics attributes related to the perception of innovation or fashion. Thus, their exchange value within the then current market was dependent, to a significant degree, on their perceived newness in functionality and aesthetics. Over time, both functionality and aesthetic attributes become outdated, relative to later models and so the value of those attributes becomes diminished, which is reflected in the minimal exchange value of such objects.

In re-presenting the artefacts within functional compositions, as illustrated, artistic or aesthetic value can be restored – partly by presenting the artefacts as components with larger, aesthetically sensitive assemblages, and partly because within these compositions, their old-fashioned styling can be appreciated (i.e. valued) anew. This is because the reappearance of a rejected or discarded object within a contemporary composition can afford the object a fresh decorative value. Moreover, if the underlying basis of such a re-presentation is understood as a contribution to design for sustainability, the composition can also acquire a certain ideological or even political value. In addition, the fact that the re-presented product is old-fashioned can mean that, within the functional composition, it acquires a certain sentimental value – stimulating memories of an earlier time. Lastly, when the old product is combined with new technology to provide a new functionality, its use value becomes reinstated.

Thus, the functional composition or 'Design Redux', as presented here, would seem to be one avenue for designers to fruitfully explore in their attempts to address sustainable concerns. It offers a means for restoring value to rejected objects in a manner that touches upon all the categories of artefact value identified by Walker and Chaplin. In the process, it contributes to a re-appreciation of existing artefacts, and can help moderate the need for new artefacts, and help reduce the number of older products entering landfill.

Notes

1. Spiritual teaching from around the world, from the Bhagavad Gita to the Gospels have taught that material possessions can be impediments to happiness and contentment. Many contemporary studies tend to be in accord with these teachings. Although results of research into 'happiness' differ, as would be expected with such a subjective notion, a 2003 study published in the New Scientist suggested that wealth is not directly linked to happiness and that many of the world's happiest people live in poorer countries. Key criteria for happiness included a genetic propensity to happiness, marriage, friends, and desiring less (BBC, 2003). In a 2006 UK

study, researchers suggested that consumerism is related to unchanging 'happiness' trends (Easton, 2006). The conclusions of a recent study, again published in the New Scientist, has bucked this trend to some extent, suggesting that those living in the wealthiest countries are among the happiest. However, even here, the main criteria for happiness tend to be associated with health and education, with economic security also being a factor (Khamsi, 2006). A survey on 'happiness' in British Columbia in August 2006 identified the key 'happiness' factors as family, friends, career/work, health, and personal freedom (Mustel, 2006).

2. 'Mash Up' is a term that applies to utilizing digital data from different sources and recombining them in new ways. The term refers to the phenomenon of re-mixing in music and video as well as other web-based applications. Google maps, for example, have been combined with information from other sources to produce useful solutions for particular interest groups. A general introduction to Mash Up is available at Wikipedia at: http://en.wikipedia.org/wiki/Mashup_(web_application_hybrid), accessed Dec. 28th 2006
An article describing Google Maps mash ups is available at: www.javaworld.com/javaworld/jw-01-2006/jw-0116-google.html, accessed Dec. 28th 2006

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DANCING WITH DISORDER: SYNERGIZING SYNERGIES WITHIN METADESIGN

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Abstract

Whilst 'design for sustainability' has made enormous strides in the last forty years or so, it has failed to reduce the global, net increase in harmful modes of consumption. One reason for this is that the key forces are beyond the normal remit of the designer. In seeking to remedy this problem the paper offers an ambitious vision of 'metadesign', suggesting that metadesign teams should assist in the general task of governance. Here, 'metadesign' is defined as a cooperative, consensual, imaginative, catalysing, and self-steering process of social enterprise. 'Design thinking' is a way to orchestrate a variety of professional practices in ways that might replace orthodox bureaucratic approaches that are currently maintained at the nominal, fiscal, legislative, or planning levels. The current, two-year phase will receive funding by the UK's AHRC. This research is informed by twelve months of preliminary work that was supported by the UK's EPSRC and AHRC. In seeking a viable way to evaluate the outcomes of metadesign the paper proposes a framework that seeks to measure different modes of 'synergy' as a substitute for the concept of 'environmental sustainability'. The current work will culminate at the end of 2008 with the delivery of a benchmarking system that would enable trading bodies, governments, or corporations to evaluate many simultaneous efficacies. The final aim for this scheme would be to calibrate appropriate indicators that would summarise many orders of synergy within a single value. Theoretically speaking, the highest mark of assessment would imply that there is a full 'synergy of synergies' (Fuller, 1975).

Introduction

The 1995 World Summit on Social Development defined the notion of 'sustainable development' as "the framework for our efforts to achieve a higher quality of life for all people." A later Summit (2002) expanded this definition to identify what it called "three overarching objectives of sustainable development". These were: eradicating poverty, protecting natural resources, and changing unsustainable production and consumption patterns. Whilst these objectives sound reasonable, they may continue to elude our grasp until we can re-design their relationship to one another. It is becoming increasingly obvious that the discourse of 'sustainability' has failed to halt what Giddens (1999) calls the 'runaway world' of globalisation and economic growth. As we are now seeing, this failure is playing a significant role in the extinction of many living species, and is bringing about a troubling change in the climatic conditions that have sustained human existence so far. Part of this problem is the mindset of 'sustainable development' that was inspired by the 8rundtland Report of 1987. In wanting to support the humanistic desire for a fair and dependable future, Dr. 8rundtland adopted the verb 'to sustain'. Whilst she originally used it as a qualifier for the notion of 'social development' subsequent writers have increasingly tended to omit the word 'development' and to stretch meanings from the word 'sustainable'. In some cases this has created confusion, and in others it has defied semantic logic altogether.

Sustainability is Unsustainable

Confusion surrounding the term 'sustainability' is common within environmentalism and almost ubiquitous beyond it. For example, many people now speak of 'sustainable business' in a sense that ignores the earlier environmentalist sense of the word. The literal meaning of the adjective 'sustainable' may be, in the short term, appropriate for describing economic endeavour. However, because of its more common usage in

environmentalism, it also conveys an air of moral credibility, whether or not this was intended or, indeed, deserved. The term 'sustainable consumption' is also confusing. Use of the word 'consumption' originally derived from a study of the habits of a newly affluent class, by Thorsten Veblen, who coined the term 'conspicuous consumption' (1899). Although it was later adopted in a less socially critical way by the economist John Maynard Keynes, the earlier meaning of the verb 'to consume' means 'using something up' so that it cannot be retrieved. Although this sense of the meaning may have been eroded, we still use it disparagingly to describe citizens who shop without reflection or restraint. It is therefore surprising that the United Nation speaks of 'sustainable consumption'. At the literal level, this term is an oxymoron whose usage needs clarification. How helpful is it to continue to use an expression whose meaning distracts us from the truth?

Sustainability Sustains Capitalism

In seeking to deepen our understanding about the meaning of what we have now come to call 'sustainability', it is helpful to explain what preceded it. Since the 1960s, many of us have spent a great deal of time thinking about 'alternatives' to the status quo. Up until the early 1980s, the idea of 'Alternative Technology', for example, seemed totally reasonable. Today, within the mindset of 'globalisation' it makes virtually no sense. 'Alternative' to what? The idea of 'alternative possibilities' had emerged from a world in which capitalism and socialism co-existed as bitter rivals within the same world. The interest in 'alternatives' therefore carried strong political undercurrents. The Brundtland Report prepared the intellectual ground for globalisation. Published two years before the Berlin Wall was torn down, it reconciled the idea of 'sustainable development' with economic growth with a desire to bring about a fairer economic deal for the poorest nations. In this sense 'sustainability' is associated with a vision of globalisation. In order to clarify the meaning of any of the above terms it is helpful to analyse the deeper meaning of the verb 'to sustain'. The verb to 'sustain' is transitive, and implies that there is clear distinction between subject and predicate - i.e. 'that which does the sustaining', and 'that which is sustained'. It is easy to forget that it has both a temporal and a non-temporal meaning. In other words, we may sustain something over a period of time, or we may sustain it within each passing moment, in a literal sense, by 'holding it together'. If it is true that everything is reciprocally dependent, chaotic, and non-linear, then the second meaning may be the wiser one.

What is it that Sustains Sustainability?

In the West, the grammar we inherited from the ancient Greeks has given us a heightened awareness of 'purpose', and a rather linear understanding of 'cause' and 'effect'. However, we may note that the direction of causation is often unclear when we reflect upon what sustains what. What we assume to be a cause may turn out to be an effect, and vice versa, because actions are usually co-creative. We now therefore know that the world is rather less predicable than we had hoped. It is important to look beyond this notion and to get a sense of the full complexity of the world. In effect, our worldly power in is limited by our biological nature and context. We need to remind ourselves that our continued existence is sanctioned by an ecological system, of which we are only a tiny (if troublesome) part. This can be illustrated if we take the context of a given situation, then frame questions about it in a simple language of cause and effect. For example,

- What is it that sustains our lifestyle?
- What is it that sustains food, shelter, and health?
- What is it that sustains our technology?
- What is it that sustains our capital?
- What is it that sustains our society?
- What is it that sustains our culture?
- What is it that sustains our belief system?
- What is it that sustains the environment?
- What is it that sustains nature...?
- What is it that sustains God?

Whereas the syntax of sustainability upholds the linear, causal worldview, ecology itself is emergent and manifold. Attempts to offer replace the word 'sustainability' with terms such as 'sustainment' (Fry, 2002) or 'co-sustainment' (Wood, 2000) have not yet become generally adopted. We need to consider what sustains what, and for how long. Do we sustain technology or does technology sustain us? Where, and what is the primary source of economic exchange? Isn't money a self-organising system? At a deeper level, aren't we implying that 'green' industries can sustain Nature...? Surely, nature

sustains us?). As we all know, not everything can be sustained. Philosophically speaking, we would not expect to sustain, say, time itself. Temporality, and its essence within Nature, seems to be an inescapable fact. Birth and death are intrinsically part of 'time', and we perceive this as a process of flow. However, our transactional system thrives on the rhetoric of ownership and authorship. It is common for vendors to be paid for aspects of their products they did not create. Hence, they may, routinely claim them by association. This is so common that, as consumers, we half believe their claims. One reason why this is so is that we live in a 21st century belief system in which human agency is perceived to be all-powerful. Hence, for example, we may want to sustain our supply of fresh food. Technology has enabled us to achieve this, up to a point. Although the freshness itself cannot be sustained, advertisers work very hard to sustain the illusion that their product is the very source of freshness. Hundreds of years ago, when world population levels were far lower, this kind of conceit was unimportant. However, because we urgently need to develop a closer accord with Nature, it can be understood as dangerously self-deluding. It is only an example, but it is symptomatic of the belief system within which most designers are trained to operate. This is one reason why eco-design has failed.

Designers Need to Re-Design Capitalism

Up to now, every attempt to invent a mode of 'design for sustainability' has been marginalised, appropriated, and subverted within a wasteful market system in which designers must uphold the status quo. How might we develop an economy that truly 'co-sustains' the eco-system? Although this represents a massive undertaking, it is not impossible. But in order to achieve it, we would need a more 'joined-up' society. At the professional level, where specialist 'eco-design' practices are an important, but inadequate response to the whole problem we need a more collaborative, shareable discourse across the design disciplines. Designers would probably need to orchestrate many more types of knowledge within a common professional framework. Some believe that it is not their job to solve social and environmental problems. However, if, as it is claimed, 80% of the environmental impact of today's products, services, and infrastructures is determined at the design stage (Thackara, 2005) we may agree that designers have failed to live up to their full potential in regard to the above problems. Since the 1950s we have tried to create a 'sustainable' world by 'reforming the environment' (Fuller, 1975), reducing the scale of enterprise (Schumacher, 1973), or creating biodegradable, longer lasting products. However helpful they may be, attempts to inform designers about the 'best practices' of Eco-design (e.g. Datschefski, 2001; Fuad-luke, 2005) have failed to stem the growth of a global economic system that threatens our shared well-being. Despite attempts to emulate nature (Benyus, 1997), 'de-materialise' products (Diani, 1992) or make them leaner (Stahel, 1982), cleaner, slower, service-based (Manzini, 1994), designers in the 1980s became resigned to working with, rather than against market forces (Burke & Elkington, 1987; Dewberry, 2000). Global carbon emissions are rising steadily, and bio-diversity continues to fall. Unwittingly, designers have helped to create a society driven by over-consumption and waste.

The Emergence of Synergy

In wondering how to evaluate the effectiveness of such a complex system we asked whether it could be evaluated by using 'synergy' as a performance indicator. Society would need to enhance the better-known synergies within food, or energy production. It would also need to look for new levels of synergy that might emerge from within, between, and across many social, political, ideological, economic and biological boundaries. Fritzhof Capra (2002, p. 202) depicts the ecosystem as a flexible, ever-fluctuating network. Its flexibility is a consequence of multiple feedback loops that keep the system in a state of dynamic balance. One aspect of this is what is sometimes called circular causality (Foerster, 1984). Many complex systems have no discernible single external cause. When we explore what sustains them we find the most significant 'causes' to be aspects of their own make-up. On the other hand we should remember that the idea of a closed system is dubious or limited. Probably all systems are open systems. In many social systems, poor levels of human adaptation tend to cause deterioration in relations and this creates a noticeable increase in the level of conflict (Brennan & Peter, 1995). The idea of 'feedforward' therefore becomes important. This is an anticipatory (often cognitive) process that is important to most complex endeavours. Because, in practical terms, time is irreversible, leaping cat cannot use feedback to change direction in mid-air. It must therefore envision its journey using

processes of feedforward. This process cannot be entirely precise, so we need some predictive processing. Many problems get so tangled up in the efforts we apply to solve them that we cannot be sure whether we really solved them or not. Gregory Bateson, (1972) notes that abductive thinking is rife in nature. This is another way of saying that creative guesstimation plays an important role within the communication process. It gives us an important (post-romantic) context for the future role of creativity and the imagination.

Towards a Synergy of Synergies

As if this were not complex enough, Nature works across individual systems in order to enable emergence to be coherent. James Lovelock's famous Gaia hypothesis (1979) reminds us that virtually all 'discrete' systems are embedded within – and influenced by - larger or parallel systems. Their dynamic nature means that the need to adapt is endemic in nature. Another way to put this is to describe the need to create dynamic synergies across, among, and through existing synergies. Here, Buckminster Fuller's grand, if somewhat mysterious idea of a 'synergy of synergies' (Fuller, 1975) is helpful. I would define it as a totally comprehensive equilibrium that emerges from manifold diversities and mutual adaptabilities. This exemplifies the high level of design thinking that Fuller pioneered. Although his term 'synergy of synergies' was intended as a description of Nature, it is nevertheless inspiring to apply it to the idea of metadesign. Fuller sought to consider the whole human species within its habitat. In place of 'sustainability' arguments, we believe that a lattice of mutually enhancing synergies would be more effective, and appealing to 'users'. Simple synergies are well understood. Their uses are well documented in traditional studies of metallurgy (Fuller, 2000), chemistry (Polanyi, 1969). However, applying the same principles to metadesigning is unlikely to be straightforward because social, cultural, ecological, or aesthetic synergies are less quantifiable and predictable than their mechanical counterparts. Complex systems can become sub-optimal or even self-defeating. (Fuller, 1975; Corning, 2003). Some elusive and intangible synergies may therefore hover on the edge of chaos. If so, they may even be affected by the participant's state of mind. This raises new practical, political and philosophical questions for metadesigners, who might try to 'seed' the conditions for optimism and positive consensus within the process of 'co-design'. Our research will therefore explore the practicality of methods for cultivating 'luck' (Wiseman, 2003), 'happiness' (Cziksentmihalyi, 1991), or 'beneficial memes' (Wood, 2003; Spring & Wood, 2005).

A Post-Darwinian Discourse

In order to ensure that design works at the level of lifestyle metadesign teams would need to integrate many systems. It may not only need to work at the primary levels of energy, food production and transport, but also within the creative industries, education, politics, and religion. As climate change and resource depletion kicks in, over the next few decades, our energy-dependent systems that sustain intensive farming and long-distance transportation will begin to fail. There will be a plethora of 'quick-fix solutions that try to solve these problems with technology and legislation but these will fail unless they are sufficiently comprehensive and integrated. We need a new discourse that is able to explain how things work in a more holistic and relational way. This would be needed in order to promote a more consensual, de-centralised system of governance. Whatever system of metadesign we adopt will therefore need to make individuals more creatively responsible and ecologically attuned. But, even if we could find one, how would we evaluate the efficacy of such a complex and interdependent system? One way to do this, our team concluded, would be to look for processes that fulfil the 'law of increasing returns' (e.g. Romer, 1987), and provide 'ecologies of scale'. In order to enhance the efficacy of these process, we would need to measure their synergy levels as well as we can.

A Cross-Disciplinary Team

Throughout 2005, working with funding from the UK's AHRC and EPSRC, we worked with a cross disciplinary team of fourteen researchers to ask whether some form of 'metadesign' practice might be useful. In 2007 we were awarded a far larger grant from AHRC that will enable us to explore different orders of synergy that might emerge from the complex practice of metadesign. What do we mean by 'metadesign'? This was one of our first questions. We began our answer by adopting Ascott's (1994) idea that 'design as planning' could be replaced with 'design as a seeding process'. In consultation with metadesign expert Dr. Lisa Giaccardi, of Boulder University

we envisaged a unified, consensual, systemic practice that would act as a 'systems integrator' (Galloway & Rabinowitz, 1983). The team of researchers we invited included both theorists and practitioners. For example, Bill Dunster's work entailed managing the efficiencies of energy conservation and generation. This aspect of his work dovetailed with the findings of two other of our researchers, a building scientist and a practising architect. Professor Philip Jones, a buildings scientist, uses laboratory methods to improve the conservation and management of energy in very large buildings around the world. His work is closely integrated with the designs of architects and planners, to ensure that synergies at one level can be maintained by synergies at another. A disadvantage of discrete, specialist design practice is that it offers incomplete solutions. Hence, the advantages of living in a low-energy house would easily be cancelled out by driving long distances to work, even in a 'low energy' car. Jan-Marc Petroschka, our expert in social housing is also an innovator in the design of live-work dwellings in London. Under his guidance we discussed the feasibility of 'scaling-up' the suburban BedZed agenda to become a fully interdependent urban 'living style'. This is because greater economies of scale can be achieved within cities, rather than in rural areas. Some of Jan-Marc's ideas on space-saving 'live-work' architecture are shown in his critically acclaimed housing project (Astra House, MacDonald Egan & Partners), recently completed in the Deptford area of London. Whilst neither the BedZed, nor Astra House projects have required significant technical innovation we were interested to know why pioneering initiatives like these often take a great deal of time to gain acceptance, or even to inspire imitations.

Designing a Metadesign Profession

Some researchers have tried to work with the really 'big picture', as this seems to be the most sensible approach. One attempt became fashionable in the 1960s and 1970s as a number of ideologically-driven attempts to build 'alternative' communities that would reduce consumption and focus attention onto sustaining local wellbeing, rather than upon maximising corporate profits. This approach implied a new design agenda, based upon ecological lifestyles, rather than economic products or services. However, for this reason it became increasingly marginalised within a political order that made economic growth its primary goal. Where the quest for 'alternative', or modest lifestyles the larger economic context has driven up the necessary scale of operation. One of the more fitting strategies is the idea of reframing 'consumption' as a repetitive, unbroken cycle of opportunities for sustainable business (Hawken, Lovins and Lovins, 2000). As I have suggested, industry has so far found it hard to think too far outside the economic status quo. Attempts to design industrial systems as a 'zero-waste' process (Murray, 2002) or as a system of production that can be orchestrated from 'cradle-to-cradle' (MacDonagh, 2002) look promising, but have yet to be perfected. It is likely that this type of system will take a long to perfect, but it is important to identify a vision and aims that will help to rally support. What if metadesign teams were to run governments, farms, and banks? This is a highly ambitious, entrepreneurial and, perhaps, even subversive idea. Nevertheless, it is worthy of consideration. Whilst we would not want to erode existing traditions of professional practice, society needs to change very rapidly if we are to avoid the impending environmental calamity that is looming.

A Four-fold System

We developed several mapping methods that facilitate close inquiry into such a question. In one example (figure 1), the early difficulties in gaining acceptance for a novel scheme can be grasped by monitoring the actions of four 'players' and the six relations that co-sustain them.

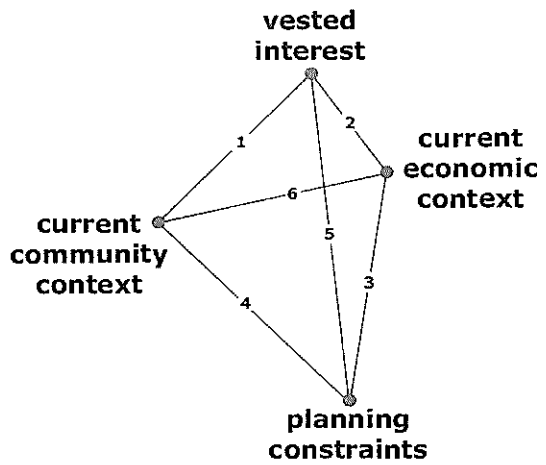


Figure 1. Simplified (four-fold) model of the challenges in housing innovation

Whilst useful, this is inadequate way to represent the vast number of tiny, but significant factors that are, to a significant extent, reciprocally self-creating. In short, it may not contain enough information to be effective. Complexity must therefore be apprehended as a whole entity. In this case, for example, BedZed needed to gain the support of a cluster of interested parties, each of whom may have a different 'vested interest'. The support of a given individual is usually, also, influenced by the perceived views and likely actions of others within the cluster. Figure 2 shows all of the above 8 players (the dots on the diagram) linked together (by lines) in a minimum set of 28 links. If we are to represent all of the possible relations within the system, it would be wise to explore each link in turn, using a positively creative, opportunistic, and open-minded approach. This may mean that the 28 links can also be represented as 56 relational viewpoints. By using this map opportunistically and creatively it is possible to design points of critical intervention, and to devise new solutions to this kind of complex problem. We believe that this mapping system can enable complex 'vicious circles' to become transformable into more 'virtuous circles'. As such, it is a useful tool for metadesigners.

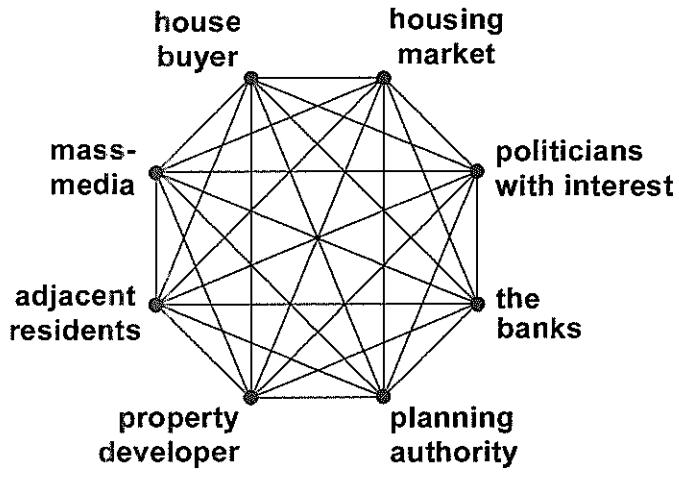


Figure 2. The 28 possible relationships in an 8-player system

Working with super-complex systems

The relational mapping method we used in fig. 2 was inspired by some original research by another of our researchers, (Dr. Vadim Kvitash). Vadim holds many patents on a comprehensive system for evaluating something that is akin to the 'equilibrium', or 'balance' of whole systems within a medical context. His system of 'Relonics' (Kvitash, 1983 & 2002) offers a powerful, systemic language of complex, interdependent relations. In one application he finds a use for the otherwise discarded data taken from laboratory analysis of the blood samples. Arguably, in orthodox medicine, if the experts only look for 'abnormal' levels of particular chemicals associated with a given illness most of this data is ignored. In Vadim's system, we are also interested in the total set of relations between each individual factor, and each other factor. As the number of factors increases the resulting number of relations rises exponentially. This means that when we use a reduced set of isolated indicators to make a judgement, we are overlooking some of the information. Mathematically, the number of factors in a given set determines, with 100% accuracy, the finite number of relations implied. At this level of logic, we can therefore know exactly how many relations are possible. How we interpret them is another matter, but Dr. Kvitash can forecast, with 95% accuracy, whether a patient will live or die within three years of a heart operation. Where more discrete, analytical methods tend to look for single, identifiable parameters, his system plots relations against a non-statistically derived set of self-balancing norms (he calls 'relons'). We have evaluated his system using urban planning situations, rather than medical data, concluding that it is likely to be just as useful.

Transforming Vicious Circles into Virtuous Circles

Another of our researchers, Hannah Jones, looks at the potential for sustainable urban planning by seeing the spaces between buildings as possible sites of unintended potential. By describing these unconsidered zones as 'awkward spaces', she acknowledges the inescapable ambivalence between that which is planned and that which inevitably follows as a by-product of the logic of form and flow. At a time when the public rhetoric of 'iconic buildings' is used to totalise an ethics of grace and power, Hannah prefers to celebrate the maladroit, the uncanny, the chaotic, and the dissipative. In working to establish a comprehensive language of urban incompleteness, she opens up unforeseen possibilities for the metadesigner. One of the aims of her project is the prospect of transforming 'vicious circles' into 'virtuous circles'. (See figure 3)

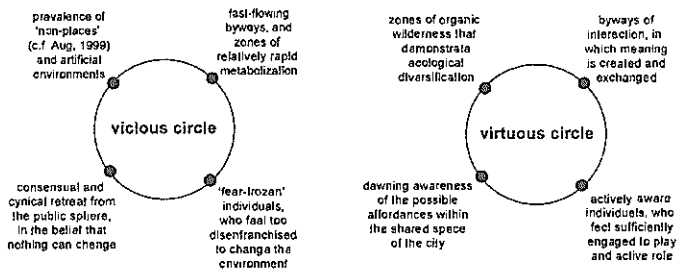


Figure 3. Transforming a 'vicious circle' into a 'virtuous circle'

Mapping Synergy

Although the concept of 'synergy' appears to be well understood in management, and elsewhere, its definition is surprisingly vague. This is partly because synergy itself is elusive and changeable. Indeed, all of the definitions we found were too generic to be useful. In seeking measurable outcomes, we therefore defined four fundamental 'orders' of synergy that would help us to map, and to manage the complexity of a practical system. This scheme regards Peter Corning's (1983) observation that some bioeconomic synergies include 'information-sharing' capabilities. I adopted this as our 'second order' synergy, the added 'data-storing synergy' (first order), 'knowledge-sharing synergy' (third order), and 'knowledge-sharing synergy' (fourth order). This tool makes it possible to 'metadesign' for complex conditions by mapping them as manageable task domains that can subsequently by re-integrated within the whole.

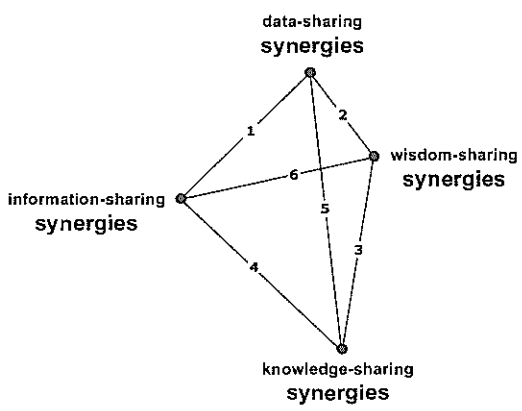


Figure 4. Using our 4 Orders of Synergy to map a 'Synergy-of-Synergies'

Figure 4 shows a crude mapping of our four Orders of Synergy. It reflects four levels of complexity intended to encompass, and 'synergise' a wide range of other synergies. Where, for example, the 'data-sharing' level might include, say, smart metallurgical synergies, the 'information-sharing' level might facilitate sophisticated energy management systems. Where the 'knowledge sharing' level might be used to guide the cultivation of shared social benefits, the 'wisdom-sharing' level would probably include highly ephemeral and emergent phenomena, perhaps at the eudemonic, or spiritual level.

1) Data-sharing synergies

Working with one of our research consultants, the buildings engineer Professor Phil Jones, of Cardiff Welsh University we have tried to map data-sharing synergies.
Examples include:

a) Harnessing some of the properties of smart materials, or nano-scale metallurgy, (e.g. Toyota's 'gum metal')
b) Harnessing some of the properties of self-regulating materials within autonomous systems (e.g. Buckminster Fuller's floating geodesic city)
c) Utilising the innate properties of thermal mass of buildings
d) Utilising the innate properties of passive air circulation within certain forms
e) Harnessing the climatic properties of local vegetation
f) Accommodating the yearly balance of wind to sunshine ratio
g) Passively harnessing the daytime changes in shading from direct sunshine
h) The use of self-cleaning surface technologies

2) Information-sharing synergies

These are synergies that emerge from the sharing of information. Some of these will include mechanical or electronic systems that integrate human decision-making with data-sharing synergies (e.g. energy regulation from thermostats that work within human environments). Many biological systems will also fall into this category (e.g. Emperor Penguins huddling together to keep warm).

3) Knowledge-sharing synergies

These are synergies that emerge from the sharing of knowledge. This process may occur at a rudimentary social level in which skills emerge alongside the affordances of a changing system

(e.g. flying geese). Other modes of collaboration may include new orders of cooperation (e.g. communication using tag-based web media such as Web2).

4) Wisdom-sharing synergies

These are synergies that emerge from the sharing of wisdom. Buckminster Fuller claims that '...only mutual behaviour is synergy. Synergy is the only word in any language having this meaning' (Fuller, 1997). James Lovelock's Gaia hypothesis speaks of the earth as an emergent whole that acts in a concerted way. This would resemble what Buckminster Fuller called Nature's 'synergy-of-synergies' (Fuller, 1975).

Much of our theory behind the management of our mission was underpinned by the multi-facetted research of another of our research team, Dr. Otto van Nieuwenhuijze. Otto's work includes some of the topological insights that informed communication issues, including co-authorship (Nieuwenhuijze & Wood, 2006). Some of the methods, or tools we used emerged partly as a response to difficulties of interpersonal relations that, for a short time, threatened our momentum when conducting practical workshops. Here, we used a corresponding, but different mapping system. Assigning each researcher to one of four levels reduced unhelpful conflict, thereby enabling her/him to play an optimum role. We created four levels of collaboration, each represented by a 'group' for holding the identity of one of the four roles.

Complexity	Role / Group	Approach/Mode of Inquiry
HIGHER	1 NEW KNOWING	intuitive / spontaneous / anticipatory
^	2 ENVISIONING	imaginative / critical / self-reflexive / tactical
¦	3 LANGUAGING	discursive / interpretive / adaptive / facilitating
v	4 PUSHING/DOING	hands-on / decisive / resourceful / managerial
LOWER		

Figure 5. The Four Groups and Their Roles

Where the 'New Knowing' group acted as a kind of unconscious mind for the whole team, the 'Languaging' group was able to create new meanings that would promote better communication. Where the 'Pushing & Doing' group focused on the delivery of specified outcomes, the 'Visioning' group's role was to anticipate possibilities, and to present options.

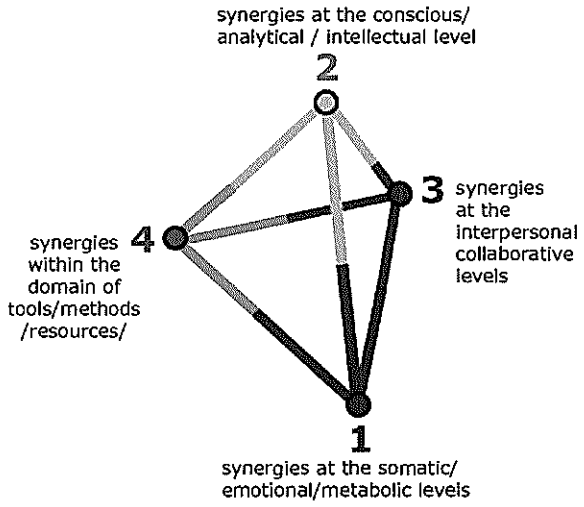


Figure 6. The Four Collaborative Roles

On March 21st, 2006 we gave the system a final test in the presence of a stakeholder, Andrew Carmichael, of the Creative Lewisham Agency. The workshop was extremely successful. During the 5-hour workshop we used the above tool to deliver several innovative solutions to Andrew's practical problem.

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FURTHER READING

(See our m21 web-site - http://attainable-utopias.org/m21)

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DISCOURSE THROUGH MAKING: THE ROLE OF THE DESIGNER-RESEARCHER IN ELICITING KNOWLEDGE FOR INTERACTIVE MEDIA LEARNING RESOURCES TO SUPPORT CRAFT SKILLS LEARNING

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Abstract

In this paper I describe the development of techniques for eliciting craft knowledge for use in an interactive learning resource, illustrated with examples from two practical research projects. In each I explored the skills of both expert and novice craft practitioners, firstly in the field of traditional bowl turning and secondly in the field of traditional clog making.

The result of this work was to highlight the personal, context-specific and highly tacit nature of such craft knowledge which is explained through a review of the writings of Michael Polanyi and Donald Schön. I conclude by redefining the concept of knowledge elicitation and transmission in this context. I describe the role of the designer-researcher as helping the expert to articulate their tacit knowledge through stimulating reciprocal reflection between the expert and a novice, and designing interpretation to help bridge the knowledge gap between the two.

Context for the research

The central problem for my research has been, from the perspective of a designer of interactive media, how to understand and transmit the expert knowledge of skilled craftspeople, with particular interest in craft skills that may be disappearing even though there are people interested in preserving those skills and learning them. For example, many traditional rural skills are essential for preserving our heritage of buildings and other aspects of rural life, but there are few people left to pass on the knowledge and learners do not have the time for traditional apprenticeships (Heritage Lottery Fund 2002). My main aim has been to develop a body of knowledge to assist with the development of interactive learning materials that support learning of craft skills.

In this research I have used a practice-led approach to explore the craft skills of both expert and novice practitioners in the fields of traditional bowl turning and clog making. In the light of outcomes from the practical work I have reconsidered the current context for craft knowledge and developed a framework to understand craft learning. Whilst they are not mutually exclusive, this paper focuses the first of three specific contributions to knowledge made by the research: in the field of multimedia design it establishes techniques for eliciting craft knowledge.[1]

Documenting the research

To manage the dual designer-researcher role undertaken in this research it was important to have an accurate recording process that allowed consideration from different perspectives and in the light of new knowledge as it emerged. However, for the research setting to be realistic, the recording process must not distract those under observation from their practice and equally must not require too much attention from myself.

When I reviewed the documentation of practical work undertaken during my previous research (Wood 2003), including use of handwritten notes, photography, audio and video recording, I concluded that video recording could most

[1] The other two contributions: development of the interactive learning resource, refining previously published principles (Wood 2003); and development of a framework for understanding craft skills learning, shall be published separately at a later date. The complete research findings are available in my PhD thesis (Wood 2007).

closely meet these requirements through reinforcing the strengths and managing the problems. The major strength of video recording was being able to capture a very rich record, including those events whose significance only became apparent later.

However, the "always on" policy led to generation of a large number of tapes that needed to be catalogued and referenced and this was managed through a simple event logging procedure. The event logs summarised both activities and speech, aiming at a clear and concise narrative of the proceedings rather than a complete record. By writing them immediately after the recordings had taken place, I was able to review them from the dual perspective of designer-researcher. They served both as a reminder of events that had taken place and allowed me to observe myself in action.

Whilst some of the outcomes were explicit, such as decisions about camera angles or specific lines of questioning, many were tacit and I only became aware of them later, such as the conflicting opinions of the practitioners on the properties of timber described below. As Buur et al (2000) propose, "video recordings ... are no longer hard data but rather the first attempts to create stories that frame the design problem and impose order on the complexity of everyday life".

Formal elicitation with the bowl turner

In my first practical project I experimentally used a systems-orientated approach to explore the tacit knowledge within the practice of an experienced traditional bowl turning practitioner, Robin Wood.[2] This involved a series of interviews and observations to elicit craft knowledge from him, using a low-fidelity prototype learning resource as a means of representing that knowledge, and observing learners applying the knowledge through using the resource to support their learning. In this paper I shall focus on the elicitation part of the process.

During the elicitation I experimented with both on-line and off-line verbal reportage techniques using concurrent verbalisation, where Robin was filmed giving a verbal report as he carried out his normal practice; and stimulated recall, where he was filmed undertaking his normal practice and immediately afterwards reviewed the recording and commented on his practice. After both sessions issues arising from the reportage were used as a basis for semi-structured interviews with the aim of probing more deeply into his knowledge.

Whilst Robin appeared at ease talking in front of the video camera in both sessions, my attempts at questioning were frequently dismissed or prompted defensive answers. For example, in the observational video he could be seen regularly stopping turning to inspect the surface of the wood and as he did so he often ran his fingertips over the surface too. On four occasions I suggested that the sense of touch played a part in this inspection, but he constantly denied or avoided the issue:

> 01.02 RESEARCHER: You can just see those bumps or can you feel them?
>
> PRACTITIONER: You can tell when they've gone because of the noise it makes.
>
> 01.15 RESEARCHER: That's what you're feeling with your hand?
>
> PRACTITIONER: I was seeing them.
>
> RESEARCHER: Seeing them?
>
> PRACTITIONER: Yes I turned it slowly round and I could see them - and I could see how deep they are so I can see how much to take off in this cut here.
>
> 01.27 RESEARCHER: You're also stroking it aren't you?
>
> PRACTITIONER: Yes - a little bit - yes - I'm pointing there at - um - I'm pointing there at where it needs to be cut off.
>
> 11.21 RESEARCHER: And there you're checking it - is that visual or feel or both?
>
> PRACTITIONER: It's mostly visual: you can see the tear out and I'm making an aesthetic decision on what quantity is OK.
>
> (Wood 2007:35)

[2] I shall refer to the craft practitioners by their first names to avoid the confusion between 'Wood' the practitioner and 'wood' the material he works with.

However, my initial feelings about this observation were confirmed about a year later when I was asked to contribute video material showing craft makers using their sense of touch for an exhibition. In this context I asked Robin again about using his sense of touch and he talked quite openly about feeling with his fingers to differentiate between tear-out on the surface of the wood that needed to be removed and natural dark markings in the wood grain, which did not.

As observed by other researchers in similar situations (Shadbolt & Milton 1999, Edwards 2003), when pressed into talking about elements that he did not have immediate answers for, the practitioner's initial reaction was to give quick responses that gave minimal insight into the situation. Argyris (1995) commented that when individuals discovered a difference between their espoused theory and their theory-in-use their natural tendency was to attempt to preserve their espoused theory, or at least minimise damage to it.

Such defensiveness proved a block to the elicitation process in the early part of the project, but Robin became much more open once engaged with helping the learners directly. For example, when one learner was critical of what he thought he had been told by Robin and explained how he had modified a technique to make it work, Robin was quite accepting of the criticism:

> LEARNER: One thing that's quite difficult. You're saying that I'm to put it in at this angle, at times anyway, but you're also saying to turn it this way, whereas if it's flat onto that and I turn it this way then obviously it comes out. So I've just been inching my hand along.
> PRACTITIONER: So you've been listening to what I say then working out the actual way to do it, obviously!
> (Wood 2007:126)

However, upon reviewing the video of the Robin's original instruction, I surmised it had been correct and the problem had been that the learner had not remembered what he had been told. Given this, it is notable that Robin did not respond in a defensive manner and instead provided encouragement that the learner had worked out what to do.

I concluded that, whilst elicitation via purposeful interviews and observations provided much useful material, it triggered a defensive attitude in the craft practitioner which limited the knowledge elicited. More was revealed by involving the practitioner in the subsequent work with the learners and the developing learning resource, and this led to an adaptation of the techniques for the following elicitation with the clog maker.

Gradual elicitation with the clog maker

In the second project I undertook a series of video-recordings with a traditional clog maker, Jeremy Atkinson, during which I developed a less intrusive elicitation technique based on increasingly focussed observation and interviewing. This overcame the defensiveness encountered with the first practitioner with whom I had initially used an elicitation approach based on his descriptions of his practice.

The elicitation technique used during this phase of practical work involved a hybrid of the focussed observation, concurrent verbalisation and semi-structured interview techniques that had been used with the previous practitioner. I started with very general observation and open questions aimed at gaining contextual information, and then gradually increased the focus of observation and questioning as my understanding grew. To help with contextualisation, the interviews were nearly all based in the workshop whilst Jeremy was undertaking his regular practice.

I visited Jeremy six times over a period of approximately two months. During each recording session I would watch his work, take notes, and talk to him whilst also continuously filming proceedings. Afterwards, I would watch the video, compare with my notes and decide upon areas requiring further clarification to be used as the basis for discussion during the next session. So, each session built upon the proceeding one with any gaps filled in by the semi-structured interviewing. Only the final session was more formal in nature, where I asked direct questions to fill in specific areas of uncertainty. By that stage he was completely at ease with the recording equipment and myself and readily talked directly to the camera in answer to the questions.

During these recordings I was also able to observe and record Jeremy's interaction with someone he was teaching. This learner was not a complete novice, having experience both

of working with another practitioner and working on his own. During the interview I gained the impression that working with the learner had made Jeremy think much more about his own skills through trying to communicate his practice to the learner. Whilst I was unable to openly interview the learner and had little time with him when Jeremy was not present, I felt his perception of the craft to be very useful. In further research I plan to explore the role of the 'expert learner' as an aid to elicitation.

This process of gradual immersion enabled me to come to a wide-ranging understanding of the craft without the difficulties encountered in the first, tentative stage of practical work, showing that this stage was effective in refining and developing elicitation methods. However, my official remit whilst undertaking the recordings of Jeremy was to generate archive footage so I did not have the opportunity to develop and test a learning resource which led me to consider other ways of validating the knowledge I was eliciting.

Boundaries to knowledge

Whilst I was able to undertake some quite deep questioning without triggering defensiveness in the clog maker, there still remained some issues where his stated theory was at variance with my understanding. As I did not have the opportunity to develop any interpretation for such theory and test it through a learning resource, I undertook a deeper investigation which revealed boundaries to his knowledge.

For example, in the documented history of clog making, alder and birch were the most commonly used clog timbers. Itinerant labourers would fell the trees and rough-cut them into clog-blocks which would be sold to clog makers who would refine the shape and nail on the uppers. Jones (1927:46) states, "the blocks must be left to dry for some months before they can be shaped into soles." Jeremy was of the opinion this was because otherwise it would split. His experience of working alder dated to the 1970s when he was originally taught the craft:

> "what we used to do was we'd go out, we'd cut a tree down, we'd come back, we'd rough cut it and ... we'd leave it on the north side of a stream, under cover against a wall. I mean you couldn't get a damper place. It would be left there in the air to circulate on a rack for six weeks, maybe, at least five. If you didn't do that it would crack on you."
>
> (Wood 2007:92)

However, Robin's experience of using green alder to make bowls was that it suffered from a large amount of shrinkage as it dried. As this shrinkage was not even; tangential shrinkage can be as much as twice radial shrinkage (see Figure 1) the wood will definitely warp and could split. To stop the splitting, his method of working any green wood, but particularly alder with its high rate of shrinkage, was to remove the pith and central few growth rings where the tension was at its greatest.

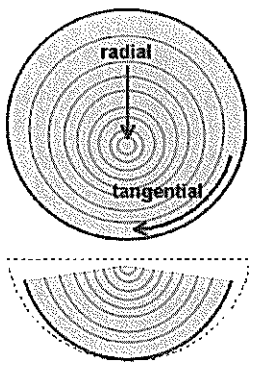


Figure 1. Timber shrinkage.

Jeremy's experience of the problems of cracking might have been caused by his own teacher's inexperience, as at that time he too was quite new to the craft. Thirty years later when teaching the novice who was now working with Jeremy, this teacher appeared to have overcome the problem in the same way as Robin described:

> CLOG MAKER, splitting the remaining log in two: "When you cut alder you are supposed to get rid of the centre anyway."
> RESEARCHER & NOVICE: "Mmm."
> CLOG MAKER: "So Robin told me"
> NOVICE: "Trevor [the teacher] told me that as well."
> CLOG MAKER (sounding surprised): "Did he? Must be true then, must be."
>
> (Wood 2007:93)

As the itinerant block-cutters were able to cut and dry whole blocks presumably without many of them splitting, this must have been common knowledge at the time and it should have been equally feasible to cut and dry complete soles without them splitting. I feel a more likely reason for this not being done was because the sole would shrink and warp as it was drying making it uncomfortable and uneven to walk in.

Jeremy, having had a bad experience with alder, put his energy into learning to use sycamore. Having solved his problem through switching tracks he was disinclined to re-examine why he had struggled with alder, preferring to believe it was the fault of the wood. In his case I feel it was lack of other craft masters that left these assumptions unchallenged.

Unpicking the possible origins of Jeremy's beliefs alongside my own and Robin's provided insight into the difficulties caused to the elicitation process by the context-specific nature of such knowledge. It highlighted the importance of the interplay between representation and validation of elicited craft knowledge in learning resource design. It would not be possible to investigate the 'truth' of all elicited knowledge and, as such investigation could also lead to defensiveness from the practitioner, it would also be inadvisable. The designer would need to validate any interpretation they created for the learning resource and other material generated during elicitation should retain its original context whenever possible so the learner can form their own judgement and make their own interpretation.

The nature of craft knowledge

To fully explain the means by which this elicited knowledge could be used by a novice and the role of the designer-researcher in the process, I shall firstly provide a brief literature review relating to the nature of craft knowledge and the ways in which it can be transmitted, illustrated by examples from the research.

The greatest insight into the nature of the knowledge that governs craft practice was provided by Michael Polanyi who sought to challenge the perception of scientific knowledge as an exact, impersonal entity through drawing parallels with more creative professions. He proposed that any expression of knowledge was greatly influenced by a complex range of knowledge possessed by the person in the act of knowing and suggested that, whilst explicit rules or formulae might influence a skilful performance, it was actually the performer's wider personal knowledge that played the largest role in guiding the performance (Polanyi 1958). He observed that much of this knowledge was so internalised and interwoven it was not possible to express: "we can know more than we can tell" (Polanyi 1966:4) and such knowledge became widely known as tacit knowledge.

On a functional level, tacit knowledge could be seen as offering advantage to the craft practitioner by reducing cognitive load, freeing the mind from one level of a task to enable thought to be directed at another. This element was described by the clog maker, Jeremy, when talking about the difficulties of the novice he was training:

> "[the novice has] got to the point where he can manage everything but he's concentrating so much on each individual task he doesn't look at the whole. Which is easy to do. It's just a sort of transitional thing. He can do all the individual things but because he's concentrating so hard on it he's not always stepping back."
> (Wood 2007:122)

Polanyi (1966:10) differentiated between two terms of tacit knowing: the proximal and the distal and described the functional relationship between the two as knowing the proximal term only by relying on our awareness of it for attending to the distal. This explains the difficulty the practitioners had describing the theory that governed their practice, they only knew it through attending to their practice. He further described the phenomenal structure of tacit knowing as that we attend from the proximal to the distal: we attend from the theory to things seen in its light, hence theory could only be learned through practising its use, a process he called interiorisation (ibid:17) (see Figure 2).

Polanyi (ibid:18) also considered the reverse of this process, where the focus of the practitioner's attention was returned to the theory. The immediate result of the action becoming proximal and the theory distal was often a complete loss of meaning; "By concentrating attention on his fingers, a pianist

can temporarily paralyse his movement". However, Polanyi believed the long-term effect need not be negative, destructive analysis of such knowledge followed by re-interiorisation could result in a more secure and accurate basis for practice (ibid:19):

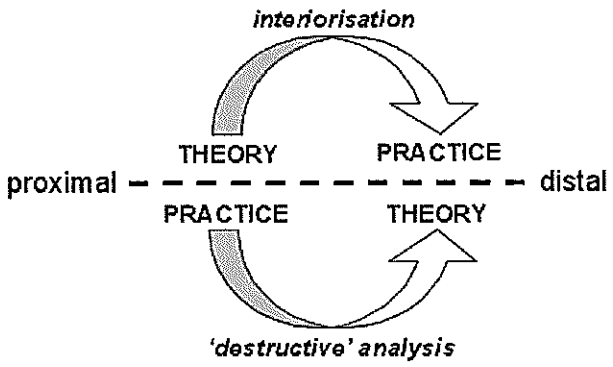


Figure 2. My interpretation of Polanyi's theory.[3]

This was described prosaically by John Ruskin (1853:54):
"You can teach a man to draw a straight line ... and to copy and carve any number of given lines or forms, with admirable speed and perfect precision; and you find his work perfect of its kind: but if you ask him to think about any of those forms, to consider if he cannot find any better in his own head, he stops; his execution becomes hesitating; he thinks, and ten to one he thinks wrong; ten to one he makes a mistake in the first touch he gives to his work as a thinking being. But you have made a man of him for all that. He was only a machine before, an animated tool."

The elicitation process described above can be seen to be making the craft practitioners turn their attention from their actions to the theory governing them, a process which can be destructive. This explains why the bowl turner, Robin, could have an incorrect perception of the way in which he held the tool and, even after observing himself on video, deny it until he returned to his regular practice then 'caught' himself using the technique (Wood 2005).

[3] This is purposefully represented as two separate processes above and below the dotted line as I do not wish this to be interpreted as a cyclical process.

Transmission of craft knowledge

Given that craft knowledge tends to be personal, context specific and highly tacit, how can it be 'transmitted' from expert to novice, or elicited by a researcher? There is a widespread belief that tacit knowledge can be transmitted from one person to the next by making it explicit and I feel this to be in need of closer examination. I feel a more accurate description to be that the expert uses explicit concepts to articulate his tacit knowledge.

Nonaka & Takeuchi (1995) did much to popularise the work of Polanyi and the concept of tacit knowledge within the field of knowledge management. They describe how individuals share tacit knowledge within large organisations through externalisation which is, "a process of articulating tacit knowledge into explicit concepts. It is a quintessential knowledge-creation process in that tacit knowledge becomes explicit, taking the shapes of metaphors, analogies, concepts, hypothesis or models" (ibid:64). This may be the origination of the concept that "tacit knowledge becomes explicit", having lifted the phrase from the context in which it was written, although the broader concept is that explicit knowledge is used to articulate the tacit. As Rust (2004) says "the idea that people's tacit knowledge can be somehow extracted and made explicit in the form of rules for all to employ ... is fundamentally misguided". The implication is that tacit knowledge could be articulated verbally through metaphors, analogies etc. or, as frequently observed in the craft context, visually through demonstration, sketching or modelling. Gamble (2002) gives a vivid description of such an interaction from her observation of cabinet-making apprentices at a trade school in South Africa: "When asked in an interview about the propensity to draw everything, an apprentice called drawing his 'third language' (in addition to two spoken languages)."

Further light on this process of articulation comes again from Polanyi who described the difference between the skill of the novice and that of the expert as "a gap to be bridged by an intelligent effort". He only views this from the perspective of the expert, explaining "Our message had left something behind that we could not tell, and its reception must rely on it that the person addressed will discover that which we have not been able to communicate" (Polanyi 1966:6). The onus in his terms is on the novice to understand through intelligent effort.

Donald Schön (1987:101) similarly referred to "an apparently unbridgeable communication gap" between novice and expert, however he suggested the solution was in "reciprocal reflection-in-action" implying that the expert needed to make as much effort as the novice in the process of bridging it. The expert needed to view the novice's actions in response to instruction as revealing the meaning they had constructed for that instruction. They needed to observe the novice's actions reflectively and respond back until they felt there was a convergence in meaning (ibid:104).

My perception of this process is illustrated in Figure 3.[4] At the top there is the personal knowledge of the expert practitioner and below is that of the novice who is seeking to bring their craft skill at least up to the level of the expert. Initially, however, there is a 'knowledge gap' between the two where the novice struggles to imitate the expert's practice, being unable to interpret their own observations. To assist, the expert attempts to articulate their tacit knowledge through use of explicit concepts. These might be adapted and refined through reciprocal reflection until the novice and expert are in accord, the novice gains experience which enables them to dwell in the actions of the expert, and the gap is bridged.

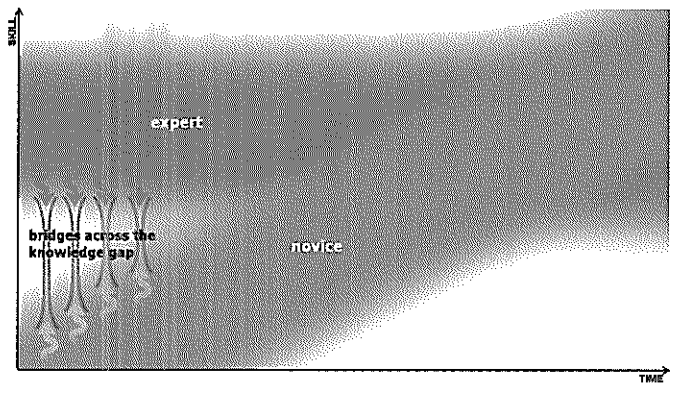


Figure 3. Bridging the knowledge gap between craft expert and novice.

My role in this process has been both to encourage the articulation, helping negotiate reciprocal reflection between expert and novice, and to design the 'bridges': the explicit concepts that could help a novice access the expert's tacit knowledge.

This was demonstrated in the research where I helped Robin articulate his knowledge of how to achieve the correct cutting angle of the tool (Wood 2007:121). During the formal, experimental elicitation I had undertaken I had failed to understand his technical explanation using angles. Working with the novice appeared to help Robin reflect on his explanation of the cutting angle of the tool. As the novice struggled to respond to his guidance he tried both modifying his explanation and physically putting the tool at the correct angle. Whilst this reciprocal reflection was not entirely satisfactory as the novice continued to struggle to use the tool, afterwards Robin continued to reflect on the experience and came up with the notion of dividing the movement into three which he demonstrated for me to record on video. Although this explanation was hesitant, it was sufficient for me to gain an understanding and then to use the prototype learning resource to develop interpretive drawings with other learners. These helped the learners gain experience of the correct cutting angle of the tool as a starting point for building their own personal knowledge of tool use.

Once the novice has sufficient skill, they will become increasingly able to interpret the actions of the expert without need of bridges. This was illustrated by Robin when he described watching another turner who uses the same sort of hook tools but on an electric lathe, making a bowl on Robin's foot-powered lathe:

> "He just naturally turned the tool over and cut back at it from that side, which I'd never done before and I said, "oh no, you don't use it that way" and then I stopped and thought, "ah, that's actually quite helpful" and so I do that quite often myself if I've not got a flat rim. So I'd been a full time professional turner for 5 years before I started doing that" (Wood 2007:128).

As they reach this stage, the learners will increasingly be able to use the broader scope of a learning resource, making use of a wider range of video clips provided without interpretation.

[4] Whilst this may look like a graph, it is not intended in any way as a mathematical representation, but merely as an illustration of the concept.

Conclusion

The practical knowledge of a skilled craft practitioner is personal, context specific and largely tacit which can present a barrier to formal elicitation, but engagement with a novice practitioner can help stimulate the expert to articulate their knowledge. The novice seeks to dwell in the actions of the expert through observing them and taking action to imitate them (Polanyi 1966:30) and the expert offers assistance in the form of explicit concepts which are negotiated through a process of reciprocal reflection to bridge the knowledge gap between them.

The process of elicitation for the designer-researcher in this context can be seen as helping the expert craft practitioner articulate his knowledge through stimulating reciprocal reflection between expert and novice, then identifying and designing 'bridges' across the knowledge gap. The result of this elicitation will be contextual footage of the practitioner working and teaching, with additional interpretation provided for key skills which expert and novice consider fundamental to the learning process.[5]

The concepts of 'true' and 'false' cannot be applied to such elicited knowledge and in their place 'helpful' and 'unhelpful' are more appropriate. The bridges are not necessarily *the* way to undertake the task, but a way that the expert feels to be helpful to get started. As their skill develops, the learner might find some of these to be the foundations upon which their skill is built, but some might be just stepping-stones on the way. Deciding which is which requires the learner to increasingly learn from experience, the feedback from their own actions, and this is achieved through developing the ability to think and act reflectively. This is where it is important that as much of the material generated during elicitation as possible should be also made available in the learning resource. It should retain its original context wherever possible so more advanced learners can form their own judgement and make their own interpretation as their skill level advances.

To test and further develop these concepts I am just starting a joint research project with another practice-led researcher who is a contemporary knife maker, Dr Grace Horne. We shall be studying the skills of the last few traditional, Sheffield knife makers with Horne acting as 'expert-learner', working alongside the master craftsmen and assisting with elicitation by stimulating reciprocal reflection. I will be observing and recording the process, using video as a starting point for developing interactive learning materials as well as a tool to help promote the expert-learner's reflection. The understanding of the master craftsman's skills embedded in these materials will be progressively evaluated using low-fidelity prototyping techniques following methods developed in the preceding research. The resultant learning resource will finally be evaluated by a group of creative metalworkers with an interest in adapting traditional skills to new practices.

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[5] The learning resource structure is described in full in Wood 2007.

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BEYOND DISASTER: ON ESTABLISHING A GREEK-TURKISH DESIGN RESEARCH PROGRAMME

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Abstract

The "Catastrophe of Smyrni", or in other words the Izmir disaster of 1922 which brought a terrible end to the Greek-Turkish interwar conflict, constitutes a major event in the collective consciousness of Greek people. The event signalled a crucial turning point for both countries: Turkey moved with more confidence towards its nationalist and secular future, while in Greece the arrival of one and a half million refugees fuelled industrialisation and accelerated the pace of capitalist expansion. The "'22" has been seminal for the formation of a consumer society in the country and is perhaps the real starting point of modernity in Greece. Among other things, the Izmir disaster changed the conditions of cultural diffusion between the two countries. Before 1922, Izmir was a multicultural city and a major centre of the Greek diaspora within the Ottoman Empire. The co-existence of the Greek and Turkish communities facilitated the cross-fertilization of cultures, which continued in different form after the disaster and the exchange of populations. This paper proposes the establishment of a joint Greek-Turkish historical research project, aiming at recording and analyzing mutual influences in the domain of crafts and design.

Introduction

The conference call for papers discusses disaster in relation to order: disaster may be defined as the breaking down of order. However, like order, the definition of disaster may be dependent on context: what counts as disaster for a particular culture, group or society may be regarded as victory for another. Also, disaster may be seen as a precondition for the birth of novelty, especially in the field of design. I have used these extracts from the conference call as the starting point for my contribution to the "disaster and design" discourse. To begin with, in Greece the word "disaster" itself ("catastrophe" in Greek) bears a special historical meaning, especially when spelled with a capital first letter («Κατοστροφή»).[1] The "Catastrophe", "Smyrna Catastrophe" or "Asia Minor Catastrophe" refers to the devastation of the city of Izmir during the Greek-Turkish war of 1922 and the subsequent expulsion of more than a million Orthodox Christian refugees from Turkey. Hundreds of thousands of Muslim residents were soon afterwards deported from Greece, in a process of mutual, officially organized ethnocatharsis that perhaps had no precedent in human history.[2] Both countries were driven by strong ethnocentric motives and the desire to create or invigorate the respective nations.[3]

The consequences of this vast unilateral operation have been cataclysmic. Greece, which had existed as an independent state since the 1830s, was following a modernisation process which was slow and wrought with problems. In Greece, then a country of less than five million inhabitants, the influx of nearly one and a half million refugees shattered the fragile social and economic balance and triggered numerous effects.[4] Such was the impact of the Izmir disaster for Greece that even today, when one wants to refer to this event and its repercussions, it is sufficient to say "1922" or simply "'22". This paper aims to discuss in particular the influence of the Izmir disaster in the field of cultural exchange and production, and in particular the domain of design and applied visual arts. The nature of this paper is exploratory and aims to suggest design domains which have been influenced by the Izmir events and point at potential areas of design historical research.

Disaster and change

Before 1922, the city of Izmir was considered by Turks to be infidel, as it was inhabited by a non-Muslim majority, mainly

Greeks, Armenians and Jews.[5] During the 19th century, the foreign inhabitants had transformed both its image as well as its social character, turning the city into a typical, cosmopolitan, bourgeois port of late colonialism.[6] Like other big ports of the eastern Mediterranean, Izmir constituted a place of "intense meeting" with European capitalism.[7] Most of the trade was in the hands of Greek merchants, who created through their activities an extensive network of relations between Ottoman markets and those of the West. In the late Ottoman Empire, Greeks and Armenians formed the majority of merchants and nouveau riche entrepreneurial groups.[8] Greek and other foreign communities were sources of a variety of cultural influences emanating from the West.[9] In this way, they acted as agents of modernisation and "Europeanisation".

Following the disaster, Greek society was fertilized by the refugees on many levels and their contribution in the formation of modern Greece has been invaluable.[10] Their massive number was itself a major factor, as it added significantly to the available workforce and at the same time enlarged demand in the local market. The population exchanges resulted in the creation of a rich, multilingual and multicultural human force, bearing numerous traditions and different types of professional knowledge, including weaving, tapestry, ceramics, woodcarving, metalwork, and decorative painting.[11] Special skills and competencies were transplanted and new industrial sectors introduced, such as carpet-making and tobacco cultivation. The special skills of Asia Minor refugees certainly constituted the motivation behind the establishment of several new industries in the 1920s.[12] Furthermore, many Greek entrepreneurs who were relocated from Asia Minor enriched the local business environment through their know-how and networking.[13] The ramifications of the 1922 events acted as a major catalyst and it may be argued that they signalled the true start of Greek modernity. [14] In his discussion of Greek industrialization efforts in the 19th and early 20th centuries, a Greek historian notes that perhaps the local society needed external pressures to change; these were provided by the 1922 events.[15]

A recent study emphasizes the need to understand the impact of the 1922 disaster both in terms of the conjecture, as well as within an international context.[16] The presence of refugees affected in three ways the development of the manufacturing domain (both large and small-size industries): first through the expansion of the internal market that it caused, secondly through the entrepreneurship skills that the refugees brought with them, and thirdly through the increase in workforce availability. All three factors were related to design[17]: The first one, the expansion of the internal market, increased the demand for manufactured consumer goods, contributed to the emergence or maturing of a consumer society and in this sense paved the way for developments in the design domain. The second one, the import of entrepreneurial skills, is also relevant if we consider design as one of the tools in the arsenal of an entrepreneur, although this point might not be as clear at that time as it is today. The third one, the increase in workforce availability has a crucial quantitative dimension, but also an important qualitative one, as many of the refugees were skilled workers, agents of significant know-how in their respective, applied arts domains. Thus, they enabled an increase in productivity and supported the development of the manufacturing sector. In practice, however, the effect of the disaster was not an isolated phenomenon and should not be examined within a deterministic conception of history; its action relied heavily on pre-existing structures of Greek industry.[18] Between 1917 and 1922, warfare conditions had created increased demand for products but also made imports more difficult. Thus, they had created favourable conditions for local industries producing consumer goods.[19]

Also, before 1922, Greek industry was characterized by intense fragmentation into small or very small firms based on the exploitation of low wages and there was no tendency towards the accumulation of capital. This tendency was further intensified by the urgent employment needs of the refugees, who had to be incorporated into the workforce as quickly as possible. Light industry was an appropriate outlet for the newly arrived masses of unemployed. By becoming poorly paid workers, they would contribute to the increase of production for an expanded market, while at the same time they would help keep the investment demands at a low level.[20] It might even be argued that the disaster turned out to be a blessing for industrial capital, because it provided the missing element for a decisive transformation of merchant capital to industrial capital: a proletariat formed by the "up-rooting" of Greek-speaking populations from Minor Asia.[21] Thus, there was a complementary, dynamic relationship between the numbers

and types of refugees and the structures and priorities already established in the country.

As one can imagine, despite substantial state support to the refugees, their adaptation and survival in the new "homeland" was a Promethean task. The social and cultural conditions in mainland Greece of the 1920s were radically different from those in multi-cultural, cosmopolitan Izmir. The majority of the newcomers were urban rather than agrarian populations.[22] They were accustomed to cultural variety, to which they were daily exposed in their homelands, and considered locals as narrow-minded, uneducated and crude.[23] They criticized them for lack of professional and entrepreneurial knowledge, and decried the poverty of the Greek state.[24] On the other hand, although they shared religious beliefs with the locals, the "Greekness" of the refugees was gravely questioned. Their presence in Greece constituted a true "cultural shock". Their particularities of language, customs and mentality added up to what was perceived by the locals as a threat to their own supposed cultural purity. Feelings of mutual suspicion, even hostility, soon developed and stood in the way of co-existence.[25] The social and political alienation that the newcomers experienced further intensified their sense of distinctive identity.[26] "We, the people of Asia Minor", they would say, in order to distinguish themselves from the inhabitants of mainland Greece. Memory was central to the life of refugee communities in Greece, even five decades after their deportation. A study of urban ethnography in 1970s Athens reveals that the refugees and their descendants still perceived themselves as having a distinct identity of which they were proud.[27]

Nationalisms and modernities

The culmination of the destruction of Izmir in 1922 was the Great Fire that wiped out the "Frank" district, the commercial and cultural centre of the city at the time, as well as the Armenian and Greek quarters. "The Great Fire involved the literal and symbolic destruction of the city, which from being an unremarkable small town in the sixteenth century had experienced spectacular growth and development to become in the nineteenth century the most favoured port of the Eastern Mediterranean. Late Ottoman Smyrna embraced a cosmopolitan population of over 200,000 in which the demographic and economic dominance of the non-Muslim groups significantly marked the city."[28] The Great Fire of Izmir did not only consume three quarters of the formerly bustling city, it also signified the symbolic destruction of space and history. Disaster and destruction were in this case also creation, an attempt to build places of counter-memory by eradicating the imagination of the dying Empire and constructing a new national imaginary.[29] Kemalist authority was defining itself as antagonistic to the Ottoman past; Ottoman centuries were deleted from Turkish history or limited to a large parenthesis speaking of corruption.[30] Alongside the elimination of the Ottoman past, very little has been written on the historical role Greece has played in the formation of modern Turkey.[31]

On the other side of the Aegean, similar strategies were employed in the attempt to solidify the ideological dominance of the nation-state. A deliberate decoupling of the "oriental", Ottoman past from the quasi westernized post-revolutionary Greek state had been taking place within the process of the construction of the nation-state since the mid-nineteenth century.[32] The Ottoman reality of nearly four hundred years is routinely overlooked till today, unless it is invoked as a negative influence and the cause of contemporary problems resulting from a supposedly "oriental" mentality.[33] The instruction of history in schools perpetuates the conception of the "purity" of Greek culture, which is presented as "uncontaminated" from foreign elements. As in the case of Izmir, Salonica, and many other cities, reconfiguration of the cityscape has been fundamental to the process of creating a nationalist imagery. In his fascinating historical account of Salonica, Mazower states: "[...] Forgetting the Ottomans was part of Greece's claim to modernity."[34]

Indeed, "nationalism comes with an active process of forgetting and selective remembering; remembering what was supposed to be forgotten brings about one of the most significant challenges against nationalistic sentiments."[35] Through such processes, both Greek and Turkish national formations have achieved a high level of homogenization, leading to a generalized and standardized culture, where pre-modern cultural varieties have been absorbed into a homogenous whole.[36] The Asia Minor refugees themselves have been socially constructed as a homogenous group, a fact which facilitated their subsequent political and institutional manipulation,

especially their assimilation into the Greek "national body". The social and cultural variety of these people was suppressed for the sake of national unification.[37] Nowadays, however, a process of "retrospective re-reading" of the histories of Modern Greece and Turkey is underway through various research initiatives.[38] There are numerous indications of an increasing, mutual interest in unraveling without prejudice the conditions and consequences of Greek-Turkish co-habitation which lasted several centuries.[39] As Mazower argues, "Nation-states construct their own image of the past to shore up their ambitions for the future. [...] But today the old delusions of grandeur are being replaced by a more sober sense of what individual countries can achieve alone. As small states integrate themselves in a wider world, [...] the stringently patrolled and narrow-minded conception of history which they once nurtured and which gave them a kind of justification starts to look less plausible and less necessary. Other futures may require other pasts."[40]

Research resources and possible directions

A designscape is the design equivalent of a landscape or cityscape, the set of material and human elements which constitute a design-related situation. The reconfiguration of designscapes during nation-state formation and development is a process analogous to the reconfiguration of cityscapes already mentioned; it is perhaps less visible, but no less real. My paper calls for a contemporary reconfiguration of designscapes in Greece and Turkey, through joint research projects that will discover, bring to attention and analyze all that has been forgotten, hidden or manipulated. In this final part of my paper, I will suggest sources and point to possible research directions in the design.

Naturally, the cultural influences brought by the masses of refugees complemented their impact on politics and the economy. One of the best known examples from the cultural domain is that of the rebetiko music typology.The emergence of this typology in Greek urban centres has been studied in connection to the musical tradition of refugees from Asia Minor, a tradition which had assimilated both folk and cosmopolitan elements.[41] Influences in the visual and design domains have been however more obscure and under-researched. One interesting exception is the ethnographic work on refugees by Hirschon, who notes the symbolic roles that many mundane, household objects, such as chairs, tables and beds, held for the refugees. These objects were invested with special significance within the household, as they stood for the sacred values of family unity, sociability and hospitality.[42] Generally speaking, cultural elements emanating from the refugees or from other local ethnic groups were undesirable and were adapted to conform to nationalist cultural and aesthetic ideals. For example, in interwar Greece, local traditional arts were baptized "Greek folk art" and "nationalized", thus losing all their multiethnic Balkan and Turkish-Islamic cultural wealth that had been developing since the eighteenth century.[43] Other recent work shows how the concept of Greekness has been widely employed throughout the twentieth century to invest products of industrial and graphic design with desirable qualities, in accordance to prevailing nationalist ideologies.[44]

There is currently a wealth of material which remains hidden and unexploited, and could become a valuable resource for design historical research projects between Turkey and Greece. At a first stage, domain-specific comparative studies could be developed in order to bring to light original archival material, generate factual information and visual documentation, and create the basis for further research. Carpet-making is perhaps the most significant area of design and manufacturing in terms of refugee involvement. Just after the 1922 disaster, carpet-making experienced a boom, which was supported by the availability of cheap labour, especially female labour. Companies which had been operating from Izmir or other parts of the Ottoman Empire became active from a Greek base (usually Athens) and continued to supply European and American markets.[45] Ceramics, bearing a long tradition in Asia Minor, is another area which deserves special attention. Subsequently, more specific research questions and projects may be formulated in the areas of aesthetics, product typologies and product uses. Possible research resources are historical and folklore museums in Greece and Turkey, such as the Benaki Museum, the Greek Folk Art Museum and the Museum of Traditional Pottery, all in Athens;[46] the Centre for Asia Minor Studies, Athens;[47] The Programme of Turkish Studies of the Institute of Mediterranean Studies, University of Crete;[48] various university departments dealing with Modern Greek, Turkish, Balkan or South-East European studies, photographic archives in the respective institutions, the press (newspapers and popular magazines), as well as private collections. Most

of the resources available have so far remained untapped due to prevailing, persisting beliefs that obstruct a historically-informed understanding of our shared past, present and future.

Conclusion

Having a major disaster as its starting point, this paper has identified gaps and possibilities in design historical research. It has been suggested that those changes in Greek and Turkish societies which are related to the Izmir disaster constitute a privileged field for studying the processes of formation of modern societies from a design perspective. The paper has provided a brief outline of this emerging research area, which appears very promising from a design history point of view and offers exciting opportunities for cross-disciplinary, cross-national and cross-cultural research.

CV

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Footnotes:

1 Matthew Stewart, "Catastrophe at Smyrna", History Today, vol. 54 (7), July 2004, 27-33.

2 Renée Hirschon, Heirs of the Greek Catastrophe – The Social Life of Asia Minor Refugees in Piraeus, Athens: Cultural Foundation of the National Bank of Greece, 2004, 17-18 [in Greek]. English edition: Oxford: Clarendon Press, 1989, 94-95.

3 Mark Mazower, The Balkans – From the End of Byzantium to the Present Day, London: Phoenix Press, 2000, 116-123.

4 Yorgos Tzedopoulos, Beyond the Catastrophe – Asia Minor Refugees in Interwar Greece, Athens: Foundation of the Hellenic World, 2003. [in Greek]

5 Caglar Keyder, "History and Geography of Turkish Nationalism", in: Thalia Dragona and Faruk Birtek (eds), Greece and Turkey – Citizen and Nation-State, Athens: Alexandria, 2006, 26 [in Greek]. English edition: Faruk Birtek and Thalia Dragona (eds), Citizenship and the Nation-State in Greece and Turkey, Oxford: Routledge (Taylor & Francis Group), 2005.

6 Ibid, 35.

7 Faruk Birtek, "The Greek Bull in the China Shop of the Ottoman 'Great Chimera' – The Role of Greece in the Construction of Modern Turkey", in: Dragona and Birtek, 100.

8 Keyder, 26.

9 For example, major architects in the area –mostly of Greek origin – renewed local architecture by introducing new typologies and employing novel aesthetic styles. For a discussion of Izmir architecture, see: Vassilis Colonas, Greek Architects in the Ottoman Empire (19th-20th centuries), Athens: Olkos, 2005, 92-125.

10 Hirschon (1989), 23. See also: Kostas Katsapis, "The Rehabilitation of Refugees in Interwar Greece: The General Outline", in Tzedopoulos, 38-40.

11 Eugenios Matthiopoulos, "Fine Arts", in: Christos Hadziiossif, History of Greece in the 20th Century, 1922-1940 The Interwar Years, vol. B, part 1, Athens: Vivliorama, 2003, 402 and 412. [in Greek]
12 Hirschon (1989), 165.

13 Hirschon (1989), 43-44.

14 Alkis Rigos, The 2nd Greek Democracy 1924-1935, Social Dimensions of the Political Scene Athens: Themelio, 1999, 74. [In Greek]

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A GENERAL LOOK AT CROSS-CULTURAL USABILITY METHODS APPLIED IN INTERACTIVE INTERFACE DESIGN: LOCALISATION AND TURKEY

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Abstract:

Over the past decade, international usability has grown as a sub-field of usability as a result of the increase in the number of computer and internet users. This study analyses the effect of culture in designing interface to serve the needs of a certain culture or different cultures. Especially recently, researchers have rather been working on adapting the cultural research methods used for printed media for use in interactive media design. Taking a general look at the field of usability as an introduction, this paper analyses the development process of cross-cultural usability in the last decade. As the next step, an evaluation of the studies concerning Turkey and Turkish users is made. In the light of the researches in question, the paper discusses how a cross-cultural usability study on Turkish users should be made. Moreover, it is emphasized that it is essential to go through a three-stage study process which involves evaluations based on present interfaces, the guides that will be formed as a result of these analyses and the realization of usability tests of guide-aided designs. As a result of all these evaluations, the paper concludes by stating the significance of realizing Turkish user oriented cross-cultural usability studies and preparing reference guides for the design process for the development of informative interactive interface design in Turkey.

Keywords: cross-cultural usability, measurement of usability, interface design, interactivity

1. Introduction

This article first takes a general look at the topic of *usability*, and then focuses on the studies carried out in the field of cross-cultural *usability*. While summarizing the literature of usability tests with a history of 30 years and our personal experience, the sections written on cross-cultural usability make up a compilation of the studies carried out within the last decade: When user needs were given priority in interactive interface design, the field of cross-cultural usability gained significance. Similarly, as interfaces started addressing to a broader mass due to an increase in the use of internet, the concept of cross-cultural usability was introduced to the agenda. On the other hand, when the literature is overviewed, not many studies based on Turkish culture seem to have been carried out. However, for an interface design which aims at a user that belongs to a particular culture, it is essential to take into consideration the characteristics of the target user type. For this purpose, the effect of Turkish culture on interface design and the preparation of reference guides for design by taking these factors into consideration constitute a significant research topic which will be worked upon in the following period.

This article aims at providing basic information for the realization of the researches in question, summarizing the development process of the issues mentioned above and presenting an evaluation of the methods developed for cross-cultural *usability* studies.

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INTELLIGENT PRODUCT DESIGNS THAT INVOLVE CONVERGENCE OF MULTIPLE TECHNOLOGIES: THE EXAMINATION OF RELEVANT APPLICATIONS IN TURKEY

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Abstract

Today the development of information and communication technologies causes interactive products to become daily objects of our lives. The most important factor in the development of interactive products is the convergence of multiple different technologies. As a result of the convergence of industries and the disappearance of industry boundaries, differentiating the products with value creation becomes important. The only way to create value through profitable growth is innovation. In today's applications of innovation, intelligent product concept arises. The term "intelligent product" is defined in two levels. First level product intelligence allows a product to store data about itself and to communicate effectively with its environment. Second level product intelligence allows a product to participate in decision process through assessing its function in addition to communicating its status.

In this research, the product development process is examined through interviews with firms that develop intelligent products in Turkey. One white goods manufacturer: Arçelik and another consultancy firm which serves for the companies that outsource design expertise: T-Design; are selected within firms. In the analysis of the interviews, through the comparison of these two firms; first and second level intelligent products and common and different applications in the intelligent product development process are determined.

1. Introduction

1.1. Importance of the subject

In recent years objects that have a constant role in our daily lives are becoming intelligent. The rapid development of information and communication technologies causes these technologies to enter into industrial product designs and interactive products to enter into our daily lives. The disappearance of technology and interfaces on objects with the growth of embedded technologies, allows ordinary physical objects to involve computing technologies and network systems (Preece *et al.* 1997).

The most important factor in the development of interactive products is the opportunity of the convergence of multiple different technologies. Converging technologies are causing industry boundaries to blur; therefore the nature of products and services changes (Prahalad *et al.* 2002).

As a result of the convergence of industries and the disappearance of industry boundaries, differentiating the products with value creation becomes important. Today, the only way to create value through profitable growth is innovation. In order to generate value and innovation in a sustainable manner; a new point of view is required, one that allows individual customers to co-construct their own consumption experiences through personalized interaction, thereby co-creating unique value for themselves. In the further applications of innovation, the focal point will pass from products and services to experience spaces created by the consumers and the producers (Prahalad *et al.* 2003).

In today's applications of innovation, intelligent products which create value through covering multiple technologies are becoming important. The term "intelligent product" is defined in two levels. First level product intelligence allows a product to store data about itself and to communicate effectively with

its environment. Second level product intelligence allows a product to participate in decision process through assessing its function in addition to communicating its status (Agarwal *et al.* 2002).

In this research, the product development process of intelligent products which contains multiple discrete technologies is examined through open ended interviews with firms that develop intelligent products in Turkey. One well-known white goods manufacturer: Arçelik and another consultancy firm which serves for the companies that outsource design expertise: T-Design; are selected within relevant firms. The interviews cover four main categories: the firms' point of view about the terms converging technologies and intelligent products, the process of product development, pursuing technology and integrating its findings into products, the further positioning of intelligent products in Turkey. In the analysis of the interviews, through the comparison of these two firms; first and second level intelligent products and common and different applications in the intelligent product development process are determined.

2. Interaction design concept

Winograd (1997) defines interaction design as "designing environments for human communication and interaction". What is meant by interaction design is developing interactive products that help users in business and daily life. This requires creating user experiences that will expand and enhance the way people work, communicate and interact (Preece et al. 1997). Now HCI, human-computer interaction goes beyond designing computing systems for one user sitting in front of one machine. It covers pervasive and ubiquitous computing technologies (Arıkan and Çendeoğlu 1997).

3. Convergence of technologies and intelligence concepts

Converging technologies are causing industry boundaries to blur; thus the nature of products and services changes (Prahalad et al. 2002). Traditionally, different industries and businesses serve different markets such as education, communication, leisure time and entertainment. Consumer electronics industry covering audio visual products like television, computer industry developing desktop and portable computers and other industries like communication devices, software, music and film can be given as examples. Not more than 20 years ago, all these sectors had different competitors and specific competitive dynamics. A camera and a video camera were completely different products. The clear distinction between products and industries such as television and computer was accepted by manufacturers, competitors and consumers.

However in today's digital consumer environment, the boundaries between products and industries disappear so computers allow the user to access television broadcast and televisions provide data transfer from computers. For example Sony "Airboard" defined as "commercial personal IT television" puts together personal computer, audio system and television. The product operating with a touchscreen uses wireless network technologies and provides internet access. It also allows displaying electronic mail, video and digital photographs without the need of a personal computer (Mobilemag 2004).

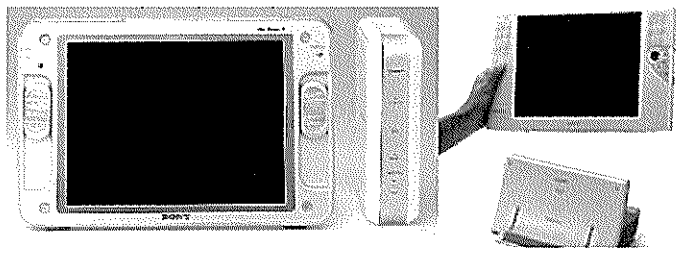


Figure 1. Airboard (Sony).

Today, developing intelligent products which create value through covering multiple technologies is an ascending trend in order to generate innovation. According to the Oxford English Dictionary (Thompson 1996) an intelligent device or machine is one which is "able to vary its behaviour in response to varying situations and requirements and past experience". Intelligent product is defined as a manufactured item which is equipped with an ability to monitor, assess and reason about its current or future state and if necessary influence its destiny (Ashton *et al.* 2002).

The intelligence concept is also defined as follows (Agarwal *et al.* 2002):

"The definition of an intelligent product is one that has part or all of the following five characteristics:

1. Possesses a unique identity.
2. Is capable of communicating effectively with its environment.
3. Can retain or store data about itself.
4. Deploys a language to display its features, production requirements etc.
5. Is capable of participating in or making decisions relevant to its own destiny".

1st level product intelligence allows a product to communicate its status so it is information oriented and covers points 1 to 3 of the intelligent product definition above. 2nd level product intelligence allows a product to assess and influence its function in addition to communicating its status therefore it is decision oriented and covers points 1 through to 5 of the intelligent product definition (Agarwal et al. 2002).

4. Methodology

4.1. The phases of research

The phases of this research are as follows:
1. The concepts of "interaction design" and "convergence of technologies" are examined.
2. Turkish companies, developing "software" and "industrial product" using interaction design and related technologies recently, are determined.
3. These companies are determined as Yoğurt Technologies, T-Design, Arçelik and Vestel. Their interactive products are examined.
4. The concepts, constituted as a result of improvements in interaction design after 1990 and convergence of technologies, are examined.
5. These concepts are determined as "persuasive technologies", "Netsmart product", "U-commerce" (ubiquitous commerce) and "intelligent product".
6. The concept of "intelligent product" is selected for research considering the existing "industrial product" applications in Turkey.
7. The term "intelligent product" is defined in two levels as follows: 1st level product intelligence allows a product to store data about itself and to communicate effectively with its environment. 2nd level product intelligence allows a product to participate in decision process through assessing its function in addition to communicating its status.
8. The aim of the research is determined as analysing "intelligent product development process" in companies developing products which fits this two levelled definition.
9. Two companies are selected within this aim: Arçelik which develops and produces intelligent products in white goods industry and T-Design which is another consultancy firm which serves for the companies that outsource design expertise.
10. Open-ended interviews with Arçelik and T-Design are made.

4.2. Interview method

"Semi-structured" interview method is preferred according to the aims of the research and an outline of questions is prepared before interviewing Arçelik and T-Design. The question outline is formed "open-ended" to ensure a detailed conversation and the interview is directed according to the answers.

4.4. Research questions

The outline of the interviews covers 4 main subjects:

- The companies' point of view about the concepts of "intelligent product" and "convergence of technologies".
- The intelligent product development process within Arçelik and T-Design.
- Pursuing technology and integrating its findings into products.
- The further positioning of intelligent products in Turkey.

5. Analysis of the interviews

These steps are taken in order to analyse the open ended interviews with Arçelik and T-Design.

- Within the aims of the research, interview questions are formed and grouped under 4 main subject headings. Two question forms are constituted as there are differences in the products development processes in Arçelik and T-Design.
- First interview was taken on March 17, 2006 with Alper Baykut, the technology group leader of R&D department, in

Arçelik Tuzla Campus.
• Second interview was taken on March 28, 2006 with Murat Armağan, the general manager and leader of design team in T-Design Maslak office.
• Both two interviews are recorded and full transcripts are written down.
• The full transcripts are categorized and diagrams are constructed according to the topics emphasized in the interviews.
• The results are analysed with the comparison of data collected under the same category.

5.1. Why Arçelik and T-Design?

Arçelik is one of the biggest companies within the domestic equipments industry. It offers its customers a wide spectrum of products ranging from furniture to computer and from white goods to a variety of small household appliances. The company, owning two of the most well-known brands of Turkey, has a market capacity over 50 %. It has gained a product range so as to address all consumer segments via its positioning in international markets with the brands Elektra Bregenz, Blomberg, Arctic, Leisure and Flavel, which were acquired in accordance with the company's international growth strategy, as well as the brands Arçelik, Beko, Altus, and Arstil (Arçelik A.Ş. 2006).

The reasons why Arçelik is preferred for examining intelligent product development process are as follows:

• Arçelik undertook the intelligent technologies of white goods in the "Intelligent House" project exhibited in Compex Digital fair between the dates 7-10 February 2002 (NTV-MSNBC 2002). Arçelik's intelligent refrigerator, washer, dishwasher, cooker and cooker hood which are given publicity in this fair; are suitable examples of first level intelligence.
• "Telve" Turkish coffee maker is appropriate for analysing new product development process, according to these reasons: being the original and initial product in its field, determination of user needs about a completely new product concept, innovative studies in research and development process. R&D studies for Telve lead up to 8 patents such as anti-spill, cook-sense and spin-jet technologies (Aydabir 2005). As a result of these investments for technological research; the product cooks Turkish coffee without the need of blending and stops heating at the proper time in order to prevent it from boiling over. Telve also won the industrial design award at iF Design 2005.
• In the development process of intelligent products, Arçelik outsources some required technologies such as the distant control of white goods via telephone (SesTek 2006).
• Arçelik services in the area of renting consumer durables such as white goods or electronics (Aydabir 2004). This application is an innovative approach in service sector from these aspects: determining user needs of a different target audience and constructing their consumption experiences. The target user model differs in pursuing technological developments, willing to experience every new technology or relocating very often.
• As a result of investments on technology and R&D studies, Arçelik develops products counted as "the first" world-wide such as Turkish coffee machine, washers for clothes weighing 3,5kg and 7kg, refrigerator with A++ energy consumption level.

T-Design works as a consultancy firm which serves for the companies that outsource design expertise. The company differs from standard design offices as it participates in Teknoloji Holding and develops innovative technological solutions and services (Teknoloji Holding 2006). T-Design was transferred to Brightwell Holdings BV from Teknoloji Holding on the 1st of June, 2006. Alphan Manas, as being the founding partner of Teknoloji Holding, broke off business relations with Teknoloji Holding and founded Brightwell Holdings BV. T-Trade, T-Tronics, Labranda, Teknomar and Teknosis companies are also transferred together with T-Design. The Brightwell Group is now a private investment company that invests globally in the areas of energy, environmental technologies, media content and entertainment, transportation technologies and services and a variety of innovative technology solutions. Sub-sectors that the company specializes in innovative technology solutions are industrial product design, consumer electronics, information and communication technologies, payment systems, biometric systems and smart homes (Brightwell 2006).

The reasons why T-Design is preferred for examining intelligent product development process are as follows:

• Within the service of "innovation management consultancy",

T-Design aims to develop patent-focused design strategies and serve its customers in their requirements of differentiating with a new product (T-Design 2003).

- T-Design develops conceptual projects without any definite customer and Teknoloji Holding makes investments on these projects if an opportunity about commercial success is foreseen. T-Design distinguishes from standard design offices that serve for companies outsourcing design expertise, with this facility of supporting and allocating resources for technological product ideas and innovative projects. The "Water Taxi" project can be given as an example for this (Armağan 2006).
- "T-Meter" intelligent water meter, which is developed and manufactured within the company as a commercial product, directs its user by giving warning at critical points (Armağan 2006). For this reason, T-Meter is an example of 1st level intelligence.
- "Ferris" refrigerator and "E-Pantry" stock control and shopping system are conceptual projects involving 2nd level of intelligence. These projects are developed inside the company through innovative scenarios constituted by researches of future life styles and pursuit of technological improvements. They are also built up without any specific customer request (Armağan 2006).

5.2. Point of view

First of all, the concept of "intelligent product" is defined clearly at the beginning of the interview so as to examine the intelligent product development process in the company "Arçelik". According to this definition, first level product intelligence allows a product to store data about itself and to communicate effectively with its environment. However second level product intelligence allows a product to participate in decision process through assessing its function in addition to communicating its status (Agarwal *et al.* 2002).

Arçelik stated that they agree with this two levelled definition. In addition, intelligence concept is defined as products behaving in an "adaptive" manner, within the consumer durables industry. According to this definition, an intelligent product follows 3 steps: perception, control and adaptation. A product must "perceive" the conditions in the course of user-product interaction, then "control" these conditions, and later on adapt to user habits within these controls. Therefore it can upgrade to the 2nd level of intelligence and participate in the decision process and determine its functions. Adaptive systems, in other words, products that adapt to the consumption experiences and learn user habits can only be personalized. In this way a product fits in with the concept of "intelligence" rather than "automation". For instance, a washer has multiple washing programs like woolies 40 degrees, hand wash 30 degrees, intensive with prewash etc. The product can offer the last selected program or the most preferred one to the user. One step ahead of this, the product is able to perceive the change of user preferences between seasons, adapt from washing woolies in winter to cotton ones in spring, thereby offer a more suitable washing option (Baykut *et al.* 2006).

The "Intelligent Home" project of Arçelik, launched as "intelligent" when it is first introduced to the market, is named "Home Automation" today. Automation means, applying human perception patterns to the products by means of sensors. Namely, the definitions and rules set by the algorithms during product development period, stays the same at the time of using. A system must learn the user preferences, adapt to the users' behaviour pattern and participate in the decision process in order to be defined as "intelligent". The definitions of "intelligence" and "automation" concepts change continually due to technological improvements. For instance, "speech-sense" technology described as "intelligent" before is now placed in "automation" category. A product's answering according to its user's speech is considered as "intelligent" in today's technology. The first product that Arçelik introduced to the market as "intelligent" in the early 90's, is the "intelligent mini oven". What makes this oven intelligent is a "timer" operating like an alarm clock. The oven warns with an alert when the time set by its user is up. This feature considered as automation today, was seen as "intelligence" formerly, in consideration of facilitating user's cooking experience (Baykut *et al.* 2006).

Arçelik conducts studies for the development of 1st and 2nd level of intelligent product designs. However the products put on the market indicates 1st level of intelligence in general. "Home Automation" system, that covers white goods connected to a common network such as refrigerator, washer, dishwasher and air condition, is an example of 1st level intelligence. These products are introduced to the market and offered for sale by

means of Arçelik's corporate web site in 2003 and sold together as a set in order to operate compatible with each other and the user. The products are controlled via internet and via telephone by speech recognition technologies without pressing any button. Users are able to run air condition, washer or dishwasher according to the home coming time and increase the cooling temperature by means of internet at work or telephone in shopping. The products use "Bluetooth" technology to communicate through a wireless network (Aydabir 2002).

As an example of 2nd level intelligence, the type of refrigerators, named as "No Frost" within the white goods industry, involves a "defrost" system which decides its own defrost time by means of sensing user experiences and adapting user behaviour pattern. But how does a refrigerator decide its own defrost time? At the time of using, an ice layer occurs in the freezer part of the refrigerator. If the thickness of this ice layer exceeds 2 cm, it covers the canals at the back of freezer. This has a negative effect on freezing and it is hard for the user to melt down this thick layer. Thus, a "No Frost" refrigerator must start the defrost process at the proper time before reaching 2 cm. As the technology for measuring the ice layer thickness is too expensive, the product must predict the thickening speed of the ice layer. In order to make this possible; the refrigerator must perceive the frequency of the users' opening and closing its door, the humidity and temperature of the air entering, the amount and temperature of food put inside. The "defrost" system analyses these data in an "intelligent" way to predict the ice thickness. Besides, the door must be closed, during the defrost process so it must be done at night. The No Frost refrigerators "perceive" its users' eating and sleeping time intervals with the help of door opening and closing histograms, and then "control" the ice layer thickness by arranging the defrost period at nights, and finally "adapt" to the user experiences and habits by defining a defrost algorithm appropriate for that home. Furthermore, this system decides the frequency of repeating the defrost process in so as to adapt both the standard using period and when the users are not at home for vacation. If a refrigerator not used for a week keeps on its standard defrost period, the wastage of energy increases (Baykut et al. 2006). For these reasons, the defrost system is considered as 2nd level "intelligent".

To give another case in this point, "intelligent energy management system" concept, which is accomplished in operating condition within the company, but not put on the market, is a suitable example for 2nd level of intelligence. The trend of "intelligence" appeared in the consumer durables industry in the 90's leaved its place to "energy efficiency". These products are launched as having "A" energy consumption level. In this system; white goods connected to a common network like washer, dishwasher and refrigerator, participate in the decision process by communicating with one another and with the user in order to provide energy efficiency. For instance, these white goods communicate among themselves to organize the energy consumption level at different periods of the day as the energy consumed in the daytime costs more than at night. They also determine the energy consumed momentarily to prevent overconsumption as a result of running too many machines at the same time (Baykut et al. 2006).

Second, the two-levelled definition of "intelligence" concept is also done so as to examine the intelligent product development process in "T-Design". The company stated that they agree with this two levelled definition. In addition, intelligence concept is defined as "the correct way of information processing". A product must store information about user behaviour and habits and process this data in order to acquire characteristics of 2nd level intelligence. As information about the user gradually increases, an "intelligent" environment that involves computing technologies is required for data processing (Armağan 2006).

In accordance with this definition, T-Design conducts studies about developing 1st and 2nd level intelligent products and concepts. For instance, "T-Meter" intelligent water meter, directs its user by warning and communicating its status when critical conditions occur. The company stated that introducing "T-Meter" as an "intelligent" water meter is a part of their marketing strategies. The product works with prepayment without receiving any bill and reports when the prepaid expense is close to end. That is to say, this prepaid water meter informs the user about its status and directs at critical points like malfunction or maintenance need so it demonstrates 1st level of intelligence. However "Ferris" refrigerator and "E-Pantry" shopping system are conceptual projects considered 2nd level intelligent as they participate in decision process by storing retrospective data about user consumption experiences and processing the information collected in this database (Armağan 2006).



Figure 2. "T-Meter" water meter (T-Design).

The "intelligent life style" constituted by "Ferris" and "E-Pantry", serves in the management of food, shopping, health and time with the use of multiple technologies. "E-Pantry" handheld terminal has a role both at home and in shopping, as being portable. Before shopping, it reports the number of stocked goods such as food or detergent to the user by interacting with the systems at home (like "Ferris" refrigerator), warns the user about decreasing goods and arranges a shopping list. At the time of shopping, it connects to the local network of the supermarket in order to show the market layout on its screen and sets the shortest shopping route by matching the need list with the layout, directs the user by showing promotions and campaigns, functions as a barcode reader to let the user see the prices. When the shopping is over, the handheld terminal connects to the supermarket network and makes the payment. In this way information about user such as kinds of goods purchased and amount of money spent, is stored and user profiles are formed according to these data. After the user reaches home, this terminal communicates with the storage units in the house and updates the stock information, thus the act of shopping is completed till the next warning about stocks on the decrease. Furthermore, all storage areas within a house are counted as an "intelligent" stocking unit in this system. "Ferris" refrigerator constitutes the cooling part of these "intelligent" units. Others can be a pantry unit for storing spice, pasta and grains or a storage area of cleaning products. Consequently, data about past usage of goods and current stock information in these intelligent units is stored in "E-Pantry" handheld terminal which functions as a point of direction in this system. Storing data about user consumption patterns and participating in the decision process with processing this information makes the life style offered by "Ferris" and "E-Pantry" 2nd level intelligent (Armağan 2006).

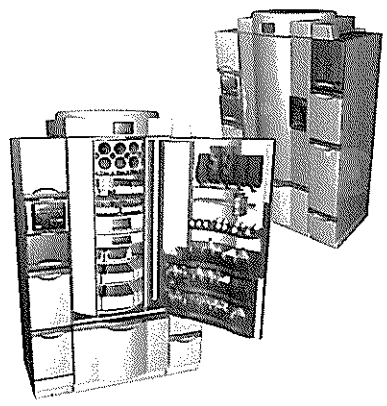


Figure 3. "Ferris" refrigerator (T-Design).

The conceptual system formed by "Ferris" and "E-Pantry" offers "service" in the management of food, shopping, health and time, with the convergence of multiple technologies like network, wireless communication and RFID. What makes this "intelligent" system serve in such different industries is the opportunity of processing data about the user consumption experiences. The new product and life style ideas in T-Design are the result of using "information" to offer "service".

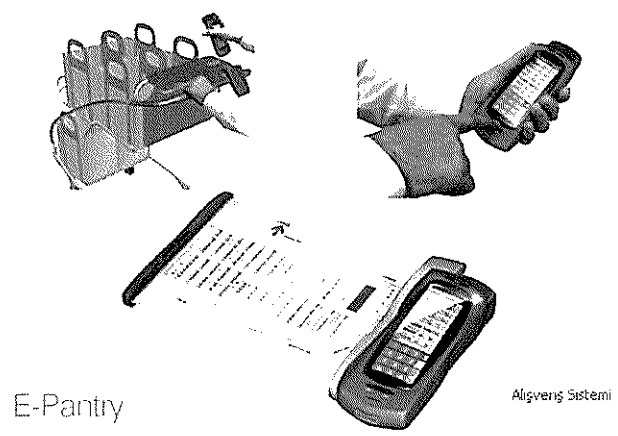


Figure 4. "E-Pantry" handheld terminal (T-Design).

5.3. Product development process

Arçelik constitutes the new product ideas in the product development process as a result of the pursuit of technological developments, making use of these technologies within products, new ideas about user needs, the trends and

tendencies come on the scene within the domestic equipment sector like "energy efficiency". For instance the new product idea for the "Telve" Turkish coffee maker arised from the need of a small home appliance that cooks the Turkish coffee in the same way it is cooked with a copper coffee pot. In this example the experience that the user wants to create is known in advance; therefore R&D studies are conducted considering this. Besides, the product development process of A energy consumption levelled washers for clothes weighing 7kg or 10kg, arises from following foreign competing firms and trends in the domestic equipment sector. To give another example, the "Home Automation" project arised initially from the need of a network between appliances inside the R&D department of the company. Many washers are connected with a network and operated continuously in order to evaluate the endurance of appliances by life tests. The network plays an important role in setting what kinds of problems occur after how many washing operations. This network technology is used in a "Home Automation" project afterwards (Baykut et al. 2006).

R&D studies in Arçelik are conducted by engineering staff within the company; however some technologies can be outsourced in case of necessity. Arçelik incorporates the technologies for controlling the electronic appliances of Home Automation project, over the phone in collaboration with "SesTek - Voice and Communications Computing Technologies". In the product development process, a new project group is formed for each new project, therefore in addition to the inside departments taking part in the R&D process, outside professionals also participate (Baykut et al. 2006).

The new product development process within Arçelik is conducted in two different ways; the "standard" and the "innovative" product development processes. The standard product development process is directed according to the trends and tendencies in domestic equipment sector, however the innovative product development process preserves the "technological company" image of Arçelik by pursuing technology and creating innovation and value. The product development process of washers with 10kg washing capacity is an example of "standard" process in which the trend of washing many clothes in one go is followed and 10 kg capacity is determined against the 7kg capacity of competing washers. Besides, the "Home Automation" project is a result of "innovative" product development process because the primary aim is developing intelligent innovative products with new technologies, not its sales profit (Baykut et al. 2006). In order to foresee user needs and consumption experiences in developing intelligent products; the company uses "focus groups" which result in user feedbacks for perception researches. Arçelik also collaborates with ÜTEST (Product Usability Unit in METU) to outsource product usability tests (UTEST 2001). These tests cover studies about how the user interacts with the buttons on an appliance or whether the symbols are comprehensible or not.

New product ideas in the product development process within T-Design constitute as a result of future life-scenarios, ideas about user needs, pursuit of technological developments and collaboration with "All Futurists Association of Turkey" (TFD 2004). When the idea of "Ferris" refrigerator first came into the picture, T-Design was serving as a work group developing future-oriented product ideas, within Teknoloji Holding. This project was developed and expanded as a system design after the company was founded with the name "T-Design" in 2003. The starting point of this "intelligent" refrigerator was a future life-scenario about food management. Every kind of food in a supermarket even fruits and vegetables are packaged and standardized now so why does a customer spend so much time for buying a coca-cola, jam in a jar or vacuum packed olives? If the customer sets his/her own preferences in product groups like this brand coke, that millilitres olive oil or diet milk, food and time management can be performed easily. As the system is used, information about user's consumption habits is stored, thus the system itself predicts user preferences. Information about the user lets the system offer shopping lists, guide the user while shopping or do the shopping via internet without going to any supermarket. This database is also used for health management as it reports the content of food in the consumer's history (Armağan 2006).

Research and development studies in concept projects are conducted by assuming potential progresses in future scenarios. Furthermore, consultancies within various engineering fields are outsourced within the development of commercial products. In the product development process, a new project group is formed for each new project, therefore in addition to the inside departments taking part in the R&D process, outside professionals also participate under the consultancy field.

The new product development process within T-Design is conducted in four different ways; commercial product development upon customer request, conceptual projects developed considering future scenarios with no specific customer, projects that Teknoloji Holding allocate its resources and makes investments, products developed within innovation management model (Armağan 2006).

In the commercial product development process, the new product request and design brief come from the customer so the process begins with an aim of developing a commercial product. "T-Meter" prepaid water meter, shampoo bottles and cream packages developed for Canan Cosmetic are examples for this process. The design criteria in this cosmetic packing project is reducing the weight of the plastic packages and developing the 500ml and 700ml bottles with the same cover to make a decrease in cost and mould number (Armağan 2006).



Figure 5. Shampoo bottles for Canan Cosmetic (T-Design).

The second type of product development process is conceptual projects developed considering future scenarios. In this type, there is no specific customer before the product design idea is formed. The project is completed in conceptual level, preliminary engineering studies and marketing analyses are accomplished. Hereafter, customer researches are put in action. The project is presented to selected companies which are suitable for this in their manufacturing facilities, vision, company profile and giro. The companies can be both local and abroad. "Ferris" and "E-Pantry" shopping system is an example of this type of product development. 2nd level intelligent products are generally developed during this process. The company uses future scenarios in which new life styles are constituted, in order to foresee future user needs and consumption experiences. "Ferris" refrigerator and "E-Pantry" shopping system can be also given as examples for the development processes of products where every user constructs its own consumption experiences (Armağan 2006).

The "Water Taxi" project can be the example of third type of product development process. Teknoloji Holding allocates its resources and makes investments on the projects which are developed conceptually without any customer request. This kind of projects sometimes does not fit in with any company profile from Turkey or abroad as they have the characteristics of a system design. If a commercial success opportunity is detected, T-Design offers this project to the investment group in Teknoloji Holding for further researches and the investment group makes presentations to the management board. Consequently Teknoloji Holding makes investment on this kind of projects according to the resolution of board. For instance, Teknoloji Holding founded "Teknomar" and "Labranda" companies in order to realize "Water Taxi" project. "Teknomar" company is a vessel operator for small (Water Taxi) to large-scale (ferries) vessels with capacities of 10 to 150 people (Teknomar 2006). "Labranda" is a material supply company that designs platforms to promote the use of composite materials and develops, tests and produces various composite materials. Water Taxi is the first product of the Labranda platform. Many composite materials are used in the fabrication of Water Taxi components (Lahranda 2006).

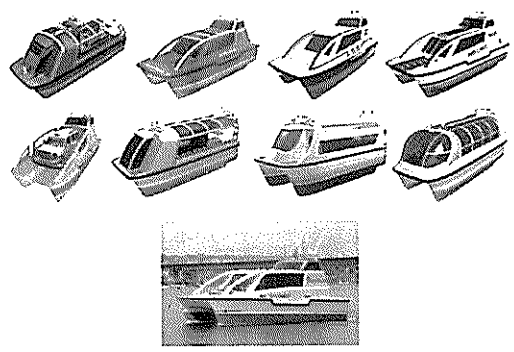


Figure 6. Water Taxi (T-Design).

The last type of product development process is the "innovation management model". It covers these services: researches about patents and existing products on the market, invention evaluation report and product development strategies with innovative design ideas. This

model aims to meet the new product development needs and differentiation requirements of the customers within a well defined methodology. In Turkey, especially small and medium size enterprises experience difficulties in the design approach while developing new products. The design briefs constituted by the customers generally involve developing a product similar to a competing one in the market, without a proper methodology. In the innovation management model, T-Design defines a process from the researches about patents to the product development strategies with innovative design ideas and forms the correct design brief with the customer at the beginning of this process. At the end, this commercial model provides the customer a patent, a design registration or a utility model, thus the differentiation requirement of the customer is brought to a successful conclusion with an added value (Armağan 2006).

5.4. The pursuit of technology

Arçelik uses CECED (European Committee of Domestic Equipment Manufacturers) platform consisting of European domestic equipment manufacturers so as to pursue technological improvements within this industry. The members of this committee develop projects and constitute work groups such as (CECED 2007):

- Energy Efficiency in Domestic Appliances and Lighting (EEDAL).
- Ceced Home Appliances Interoperating Network (CHAIN).
- Product Information project which covers delivery of product information via electronic media (PI).
- Eco Design Requirements for Energy Using Products (EuP).
- Waste of Electrical and Electronic Equipment (WEEE).

Arçelik enrolls as a member of CHAIN, WEEE, RoHS and EuP work groups. The platform, called CHAIN (Ceced Home Appliances Interoperating Network), defines the protocol for connecting large appliances in a single "multi-brand" system. The aim of a "multi-brand" system is to let the user connect appliances from different brands to the same network and operate them in a compatible way. This is designed for control and automation of key services in a home, such as remote control of appliance operation, energy or load management, remote diagnostics and automatic maintenance support to appliances, downloading and updating of data, programs, and services from the Web (CHAIN 2003). The objective of CHAIN is to build a fully automated house, giving a high added value to the consumer in terms of easiness to control the house, security, energy management, etc (CECED 2007). Arçelik participates in this group in order to make the "Home Automation" project progress.

Arçelik follows the automotive and communication industries which are the leader sectors in technology. They integrate the suitable technologies gained in these researches into the products in different ways; within the firm, with cooperation of foreign companies or collaboration of universities and TÜBİTAK (The Scientific and Technological Research council of Turkey). Arçelik doesn't put some products developed inside the firm like refrigerator with television and dryer with microwave technology on the market as a result of the company's corporate strategies about safety regulations, service network, brand policy and taking low risks (Baykut et al. 2006).

T-Design uses "All Futurists Association of Turkey" platform and "internet" in order to pursue technological improvements. The company follows the information and communication industries because they consider these sectors as leaders of technology. The promising new technologies, on which companies from various sectors made investments, are integrated into conceptual products within the future scenarios (Armağan 2006).

5.5. The future

Arçelik stated that consumers in the home market expect some features for "personalization" like offering the most preferred washing program to the user or for being "user-friendly" like remaining time display, from the washers that they buy. However the future consumer demands in Turkey's market will advance and consumers will expect interactive products that involve more "intelligence" such as adapting user habits and personalization according to multiple user profiles. For this reason, the "Home Automation" project which was called "Intelligent Home" formerly is kept on developing without being put on the market till the consumers demand this level of intelligence (Baykut et al. 2006).

Arçelik directs its investments according to the targets and goals determined by five or ten year plans. Within these plans, the company aims to develop products that are controlled directly with the users' voice in 2010. Investments are made so as to develop required technologies and to incorporate know-how with some collaboration (Baykut et al. 2006).

T-Design stated that economic parameters will take a key part in the future of "intelligent product" concept in Turkey. If the economic scenarios allow the Turkish industry to make investments on the R&D studies, this concept can make progress. Besides, it is also stated that Turkey has a promising potential in the software development and application fields for information and communication industries. The company plans to allocate its resources and investments to the services of "innovation management" consultancy and "commercial product development" rather than conceptual projects (Armağan 2006).

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TECHNOMETHODOLOGY: INTERFACE DESIGN AS A HYBRID DISCIPLINE BETWEEN SYSTEM DESIGN AND ETHNOMETHODOLOGY

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Abstract

Technomethodology is a new approach to bring together social science and system design. It proposes the foundation of a hybrid discipline which unites the crucial concepts of both disciplines. As a consequence of the advent of social computing the notion of computer literacy ought to be reconsidered and conceptualized in a broader context such as provided by ethnomethodology. It is the merit of ethnomethodological studies to put the focus on social practices. Ethnomethodological workplace studies in particular offer important theoretical insights into how everyday practices work. This paper sketches a way from conventional notions of interface design and the question of computer literacy to the issues of workplace studies which show the intricate interplay between human beings and computers. Finally it introduces the notions of accountability and abstraction as basic tenets of ethnomethodology and system design respectively. Integrated this two disciplines offer an idea of technomethodology as an up-to-date and top-notch discipline capable of tackling interface problems.

Introduction

The history of human-computer interaction is a history of the ongoing attempt to find means of operating computers in efficient and comfortable way. One important step in designing the relationship between human beings and computers certainly was the shift from the concept of 'type and remember', implemented as the command line feature, to the concept of 'see and point', implemented as today's familiar graphical user interface. The development of the graphical user interface brought about the introduction of iconic, indexical and interactive features in the use of computers. By developing screen selection and corresponding input devices the direct manipulation of virtual objects was made possible. An abstract command language no longer needed to be memorized and the state of affairs and what could be done was immediately evident. The computer was turned into an ordinary tool of information and document processing. One of the advantages of the graphical user interface was that it could be handled in a literal sense: The mnemonic burden was relieved by making things visible. So-called 'cognitive artefacts' functioning as external aids enable human beings to enhance cognitive abilities. 'It is things that make us smart. Some assistance comes through cooperative social behaviour; some arises through the development of tools of thought – cognitive artefacts – that complement abilities and strengthen mental powers' (Norman 1994, p.43). It is this notion of *cooperative social behaviour* which for me is crucial in thinking about interaction as a main concern of interface design. Cooperative social behaviour is always dependent on the means and methods of bringing together the co-operators; it is the form taking shape through *inter-action*.[1] Since all interactions take place in a socio-cultural context it seems well worth thinking about interface design beyond ergonomic and cognitive approaches. One way to do this is by referring to the concepts of ethnomethodology, namely workplace studies grounded in everyday practices and their accountability. Somehow accountability indexes the way computer literacies are thought of and are enacted in daily routines.

[1] In the sense of: "The word 'interaction' was not badly chosen; only the number and type of 'actions' and the span of their 'inter' relations has been vastly underestimated. Stretch any given inter-action and, sure enough, it becomes an actor-network" (Latour 2005, p.202).

Computer literacy

Since the advent of the computer information technology had to deal with a new kind of literacy, namely the handling of abstract machines. The term 'literacy', however, conceals the fact that more than the mere ability to read and write is at issue. It was Alan Kay who put the focus on the *media* aspect of computers in the realm of interface design. By referring to McLuhan's well-known dictum that 'the medium is the message' Kay challenged the predominant conception of the computer as a tool or vehicle. He claimed that the computer was a medium and therefore had to be conceived of as a new kind of medium. Neither in the rather passive mode of reception of the television nor in the static mode of representation of the book were the possibilities and constraints of the emerging medium computer anticipated. It is a main concern of interface design to anticipate future uses of the computers. In this sense it was reasonable to put a new kind of literacy, namely computer literacy on the agenda. So the idea of the 'Dynabook' -- a kind of dynamic document – was born. The question at issue then was how to deal with dynamic documents. To handle dynamic documents it was necessary to think of users as both authors and readers or in analogy to music composers and players respectively. 'The ability to "read" a medium means you can *access* materials and tools created by others. The ability to "write" in a medium means you can *generate* materials and tools for others. You must have both to be literate. In print writing, the tools you generate are rhetorical; they demonstrate and convince. In computer writing the tools you generate are processes; they simulate and decide' (Kay 1990, p.193).

A special 'language' is in the process of being designed and performed.[2] Since we do not yet know what the information technology will look like, we are presently engaged in shaping its future form. By our everyday practices of using the digital media we are ceaselessly (re-)building and (re-)framing our world. The main features of the grammar of the digital media are the evolving patterns and manners of information visualization and interaction styles, two crucial facets of actual interface design. In my opinion it is not a matter of sheer coincidence that nowadays we speak of the pictorial/iconic or performative turn in cultural studies.[3] The production and use of the interface has its sources in socio-cultural grounds. I suggest using the term 'Visual Programming' as a working basis, by expanding on its present standard meaning of a mere tool of code programming as it is nowadays standard. On the one hand Visual Programming implies the notion of visualization of things that matters. On the other hand it stands for the performance of an establishing and configuring order, which is the original meaning of programming. In this sense design's main objective could be said to be the development of adequate environments for Visual Programming. 'Doing with images makes symbols' (ib., p.196) is the slogan which describes the coordination of the three mentalities of human beings: (cf. ib.)

– enactive: know where you are, manipulate
– iconic: recognize, compare, configure, concrete
– symbolic: tie together long chains of reasoning, abstract

In a traditional reading the above means that we move a mouse to control a cursor on the screen which enables us to manipulate widgets which in turn help to establish abstract arrangements. Whereas the enactive components are taken into consideration through the design of input devices such as a mouse, stick, etc. the iconic components are designed as virtual object representations such as icons, windows, etc. The symbolic components come into play through program codes and schematic representations such as flowcharts, site diagrams, or information retrieval strategies. Since in everyday life human beings usually rely on all three kinds of mentalities, thinking about computer literacy and its application in interface design should take all three of them into account in a balanced way. But somehow this mental triad is restricted to an explicitly cognitive categorisation, even though embodiment as form of tacit knowledge plays an important role. In other words: this interface model promotes a metaphor of an enclosed 'tête-à-tête' negotiation and is stuck with ergonomic and cognitive issues. In such a model users are conceived of as

[2] See Manovich 2001 for a current attempt to figure out the characteristics of such a language. Although not explicitly related to questions of design Brosziewski 2003 is also worth reading in the context of new forms of communication using digital media.

[3] For an overview of all the cultural turns see Bachmann-Medick 2006.

autonomous actors who are supposed to take total control of the situation. Such concepts belong to the past and must be complemented by social concepts.

Prevailing interface concepts refer to the notion of computer supported cooperative work[4] or ubiquitous computing.[5] Both concepts loose the tight coupling between a single user and a personal computer. The advent of a post-PC world holds out the prospect of invisible computing at any place and time. Dyadic interaction of any kind is no longer the point at issue, but rather a complex network of multiple cooperations. Therefore our focus has to shift from traditional graphical user interfaces to new interface modes suiting intertwined *inter-actions*. Future computing will be characterised by features such as mobility, wearability, connectedness or situatedness. Computers will become 'Everyware' (Greenfield 2006). In this sense information technology is inducing a new kind of literacy. As already mentioned above, however, the term 'literacy' conceals the fact that it refers to more than the mere ability to read and write. Rather it is about living in an environment where human beings and computers are working together in way we can hardly describe. We certainly will no longer be able to rely exclusively on traditional means of description such as means-end relationships pursuing and fulfilling predefined tasks. Situational contingencies will have to be taken into account. Literacy will then mean the ability to manage situations in an ad hoc manner. And since computers are everyware computer literacy has to grasp the emerging patterns of ubiquitous and invisible computing: '... everyware is not something you sit in front of, intent on engaging... What it is is a radically new situation that will require the development over time of a doctrine and a body of standards and conventions – starting with the interface through which we address it' (Greenfield 2006, p.39). Everyware is about a new manner of managing situations choreographed and mediated by multifarious players – be they human or artefact.

It is not my aim here to describe or develop an educational program for computer literacy. Rather I propose studying the use of digital media guided by ethnomethodological strategies of observation so that we learn to understand how we are making use of the new gadgets of information technology. These strategies of observation will hardly provide us with guidelines for *everyware* artefacts, but in the process of observing we might encounter some tracks worth following in our pursuit of innovative design strategies.

Workplace studies

Workplace studies are an effect of ethnomethodology.[6] Ethnomethodology's main concern lies in the observation and description of everyday practices as seen and carried out by participants in social constellations: 'Their central recommendation is that the activities whereby members produce and manage settings of organized everyday affaires are identical with member's procedures for making those settings 'account-able'... I mean observable-and-reportable, i.e. available to members as situated practices of looking-and-telling. I mean, too, that such practices consist of an endless, ongoing, contingent accomplishment... and are made to happen as events in the same ordinary affairs that in organizing they describe' (Garfinkel 1967, p.1). This approach suggests that action cannot be described adequately in terms of human mentalities but rather has to be described in terms of associative practices. The prevalent notion of presupposing conditions such as detailed plans and strict rule following is undermined.[7] Scrutinizing situated action as instant orders of participating members is recommended instead. Action 'is organized in its very doing' (Button 2003, p.367) and always 'takes place within a swarm of contingencies that are demonstrably oriented to by people in the conduct of actions' (ib., p.365).

Following function – a well-known central theme of design history – is still a valid strategy to find the form of the interface. But in my opinion this strategy has to be complemented by researching *inter-actions*. Referring to ethnomethodology's program the research theme is to work out '"What More" there is to the unquestionable corpus status of formal analytical

[4] The original reference to the idea of computer supported cooperative Work (CSCW) is Greif 1988.

[5] The original reference to the idea of ubiquitous computing is Weiser 1991.

[6] A good overview is provided by Luff et al. 2000.

[7] Cf. Suchman 1987 as the fundamental work relating to human-computer interaction.

investigations...' (Garfinkel 1996, p.6). Besides supposed and predefined functions the use of artefacts is always embedded in a specific kind of practice which is bound to situational possibilities and constraints. Problems are solved in enacted ways and therefore cannot appropriately be depicted by a preceding requirement analysis which figures out the underlying functions of a technical system. Certainly any action can be planned but finally it takes place in a situation which 'depends in essential ways upon its material and social circumstances' (Suchman 1987, p.50). And it is impossible for these circumstances to be the result of advance planning because they are dependent on contingencies. Action is not carried out by a "cultural dope", 'who produces the stable features of the society by acting in compliance with preestablished and legitimate alternatives of action that the common culture provides' (Garfinkel 1967, p.68). In other words human beings are not merely strict executors of predefined roles. Norms and rules do not determine action but actions are mediated by contingent situations. Roles are flexible placeholders and are always played with great latitude and a certain amount of ignorance.

It is not at all useless to rely on the structural analysis of society as for example marketing studies do. They may be able to provide insights regarding products and services. But it is questionable whether they are able to produce reasonable advice for interface design of everyware computers as dynamic social networks. Neither is it useless to think about modelling users or developing stereotypical scenarios or relying on use cases. But in general the aforementioned methods are used to describe tasks and users but not situated actions in the here and now. So ethnomethodological studies have to be seen as alternates; they are not alternatives (cf. Garfinkel 1996, p.9). Whereas functional analysis focuses on *what* and *why* questions, ethnomethodogy's focal point is on *how* actions are being worked out. The workplace is obviously a field to study how people make work collectively worked out achievements of everyday affairs.

Workplace studies bring into focus the interplay between the various parts – that is to say participants – of organized and organizing work, which is achieved by the coordination of both human beings and artefacts. Action in organizations is brought about as a collaborative coming together of technology and man in a specific situation. In this sense workplace studies aim at circumventing the questionable dichotomy of societal and technical concerns. In everyday practice they are dynamically intermingled and cannot be analytically separated without loss of contextual conditions. It is their synthesis which makes practice work as it does. Plans and stipulated rules are just the formal side of the medal. The other side shows informal features of organizations known as improvisation under conditions of contingent possibilities and constraints, sometimes classified as non-functional requirements. In the following let me give two examples to illustrate this issue.

In the first example I refer to a study of the use of medical records. Heath and Luff (2000, p.31ff) observed a displacement of medical practice after the computerisation of medical records. In medical practice the medical record is a crucial document in diagnosing and treating patients. Reading, interpreting and writing medical records demands high expertise and experience. To draw the relevant inferences is not just a matter of functional analysis, but is dependent on the interaction with the patient during the consultation. The introduction of a computerized representation of the traditional paper-based record card amounted to a formalization of reading and writing the medical record. From then on doctors were bound to a rather inflexible tool and therefore the setting of the whole consultation session changed. Though the relevant information was indeed available in the computerized system its availability did not adequately comply with the practice of consultation based on an ongoing interaction between doctor and patient. 'The computerised system therefore removes the tailorability, economy and *Gestalt* which are essential to the production of entries within the paper record and to the ways in which entries are read and interpreted... the descriptive *Gestalt* as a representation, or embodiment of a particular consultation(s), is undermined by the system' (ib., p.47, emphasis in the original). The paper record and the computerized representation are not the same at all, though the so-called objective information in form of functional necessities is identical. The difference of visualizing and handling the information of the medical record in a sensitive interaction between doctor and patient exerts a decisive influence on the consultation setting and procedure. It therefore seems reasonable to make interface design responsive to workplace studies which provide insights into the circumstances of use of artefacts beyond the prevalent analytic domain.

The second example outlines the conduct of team work as outlined by Heath and Luff (2000, p.88ff). Team work cannot exclusively be described in terms of formal structural and operational structures, hierarchy and workflow diagrams respectively. On the contrary the tasks at hand are carried out by the emergent *inter-action* of the team members' work, which is able to change easily and adapt to different conditions and circumstances as they occur. Team work is accomplished by 'the ways in which their [the participants'] activities are thoroughly interdependent and interactionally co-ordinated with regard to the contingencies "at hand"' (ib., p.89). The control room of a London underground line is a complex milieu of multifarious artefacts such as train describers, line diagrams, announcement details, closed-circuit TV etc. These artefacts participate materially in the conduct of team work keeping regularly running the tube line. They are assistants which make possible the coordination of the different tasks of the team. Although each member seems to follow his individual task by operating the artefacts they are always embedded in the flow of the team work. Since the members' individual activities are produced with regard to simultaneous activities of other team workers they are continuously meshed in the overall practice of the line control group. 'Indeed, it appears that individual task and activities are inseparable from, and thoroughly embedded in, ongoing concerted interaction with colleagues within the local milieu... The "situated" organisation of the line control is the interactional and contingent accomplishment of a body of routine tasks' (ib., p.117). Thus team work means being involved with one another's activities and taking notice of the current mediations of technological assistance. The main issues of team work as seen by workplace studies can be exemplarily summarized as follows:

> Whilst the mutual availability of particular sources of information is utilised in making sense of each other's actions and co-ordinating them, it is the mutual visibility of the use of technology within individual activities which provides an important resource in the production of collaborative action. For example, a glance towards the fixed line diagram, a gesture towards the radio phone, or a scroll through a display of the points at a particular junction, can all provide resources through which a colleague can recognise the actions or activities of another. The use of a particular tool, even looking at a particular piece of text such as the timetable, can render the activity of a colleague visible; allowing others to co-ordinate their own actions with the apparent conduct of another (Heath and Luff 2000, p.121).

Workplace studies shed light on 'seen but unnoticed backgrounds' (Garfinkel 1967, p.118) which inform the ongoing coordination of activities. The 'seen but unnoticed' features of everyday affairs provide indexical clues as to 'What to do next?" (ib., p.12) so the activities can temporally be concerted in situ.

Concerning issues of interface design I want to emphasize two points. First, it is crucial to render activities visible. This notion coincides with the concern of information visualization, where information is rather thought of as contextual indices guiding actions than as objective facts. In this sense information visualization provides signposts of orientation and navigation for ongoing actions. Secondly, workplace studies show that action is meshed in a net of actions and thus has to be conceived of as *inter-action*. In this sense interaction styles serve as patterns for practices in a socio-technical environment where both human beings and artefacts play their respective roles. Taken together information visualization and interaction styles are essential contributors for the accountability of actions in everyday practices. In the *Gestalt* of Visual Programming they mediate the course of ordering the situation and in that make sense of the work. From this point of view they could help to accomplish a suitable awareness of the situation at issue. But we have to keep in mind that '"awareness" is momentarily produced in and through action and interaction of the participants themselves; it is not an ability, but a socially organised and contingent achievement' (Heath and Luff 2000, p.90).

Technomethodology

Technomethodology is an attempt to bring together ethnomethodology and system design. It comes along with a social turn in the domain of human-computer interaction. In this field it is standard to rely on ergonomic and psychological tenets, which --by providing usability standards, laws of Gestalt etc.-- directly instruct and inform the design practice. But what about taking into account 'social factors' in developing and using technical artefacts? In the chapter on workplace studies I pointed out that every action or interaction is embedded in

its social situated-ness; and it is in the same way that computer use relies on work settings. In my introduction I mentioned that I was interested in the kind of cooperative social behaviour achieved by both human beings and artefacts. I claim that bringing together these actors as co-operators is not an easy task and cannot be done without the sensibilities contributed by ethnomethodology's account-ability. In my opinion technomethodology is a serious candidate for the development of a kind of hybrid design discipline which integrates the disciplines of ethnomethodology and system design. In the present context the term hybridity characterizes a way of reciprocal learning of the two disciplines. From the point of view of system design Button and Dourish (1996, p.22f) present three complementary ways of integrating ethnomethodology and system design:

– Ethnomethodology as personal proxy: An ethnomethodologist is closely involved in the design process so as to inspect the field setting and contribute the relevant (social) usability criteria. The social scientist serves as proxy insofar as she has to represent the users' concerns as an intermediary between users and designers. Put simply: Ethnomethodology serves as a kind of usability testing.

– Ethnomethodology as accounting practice: Design itself is sensitive to social actions or work settings and designers know about the importance of the account-ability of social practices and writing up the users' daily routines. In contrast to data gathering as performed in marketing studies rendering accountabilities and presenting accounts is an attempt to grasp the users' involvement and experience. Put simply: Ethnomethodology helps to re-specify the context by applying a kind of user-centred design.

– Ethnomethodology as discipline: Not only the observation methods but also the very study policy of ethnomethodology is introduced into the design process as a crucial element. The relationship between ethnomethodology and system design is considered on a theoretical plane: By developing and integrating fundamental principles of both disciplines the hybrid discipline of technomethodology emerges. 'On the one hand, it deals directly with the generally operative social processes which are the currency of ethnomethodology; elements such as situatedness, practical action and representation, achievement and mechanism, phenomena of order, and accountability. On the other hand, it deals with the fundamental, almost implicit, aspects of system design – generalisation and abstraction, configuration, data and process, fixedness and mutability' (ib., p.22). Put simply: Ethnomethodology and system design converge in technomethodology as an innovative design discipline.

Technomethodology as a hybrid discipline refocusses the very concept of design by establishing a foundational relationship between ethnomethodology and design. A foundational relationship implies more than the practicalities of developing guidelines for design processes. More than project management issues or design instructions are at stake. Technomethodology is about a new foundation of system design, because it does not only provide new design methods but changes the understanding of design at its roots. In other words, it undermines unquestioned common sense categories such as for example tasks, goals, context etc. and replaces them by questions about the way these categories occur in everyday practice. These categories are not natural facts from which design needs can be derived but are factualized in social actions.

Technomethodology as a design discipline is still in its infancy and is still in need of much elaboration and assistance before it can be considered as a real alternative to traditional design efforts. But be that as it may, technomethodology brings into focus new design concepts to master *everyware* computing by scrutinizing the tricky and often ambiguous processes *in* cooperative *networks* of interconnected men and machines. At least the first ground is broken by conceiving of a 'deeper' relationship between ethnomethodology and system design:

By a "deeper" relationship, we mean one that satisfies two criteria. The first is that it attempts to draw not simply on a set of observations of a specific working setting, but rather on ethnomethodology's fundamental insights about the organization of action as being a moment-to-moment, naturally occurring, improvisational response to practical problems. The second is that it attempts to relate these understandings not simply to the design of a *specific* interactive system aimed at a *specific* setting, but rather, at the basic, fundamental principles around which software systems are developed... we need to address the problems in

an equally systematic way, considering not just this design or that design but the basic models around which those designs are built (Dourish 2001, p.77f, referring to Dourish and 8utton 1998, italics in the original).

As a point of departure the technomethodological approach suggests drawing 'on a relationship between the notion of "abstraction" in system design and the notion of "accountability" in ethnomethodology' (Dourish and Button 1998, p.413).

– Accountability: Essential notions in ethnomethodology are those of account and accountability. The basic tenet is that every action must be accountable which means that the agents participating in situational actions can and do attribute sense to the actions carried out. First and foremost ethnomethodology wants to know how social order is achieved and maintained by the conduct of adjacent actions, how action is 'observable-and-reportable'. Accountability is not just a form of bookkeeping accountancy, but a way of performing actions as both indexical expressions and reflexive interpretations at once. 'Accountability lies in the *reciprocality* of action and understanding' (Dourish 2001, p.79, italics in the original). Accountability requires an adequate reduction of complexity so that action is rendered expectable and reasonable without the air of arbitrary contingency.

– Abstraction: System design is the process of making machines accountable for users. Abstractions allow to hide the very interior of a computer and therefore make computers accessible to users. Thus abstraction is a way of managing complexity by bringing crucial aspects of an issue into the fore. 'In system design, abstractions typically function as "black boxes". They are defined by the nature of their interactions with the outside world... what we typically refer to as the "interface" to the abstraction' (Dourish and 8utton 1998, p.414).

Technomethodology addresses the problem of the accountability of computers that is it investigates how the relationships between internal behaviour and external utterances are conceptualized and designed as abstractions in the form of visualized information or possibilities of interaction. Since it is the interface which indicates possible accounts of the behaviour of computers 'interface design should concern itself with representing *whole actions with multiple agents*' (Laurel 1993, p.7, italics in the original). The interface has to show its action adapted to the flow of practices in the situation at hand. 'So the account should not simply be an abstract description of the system's behaviour, but rather an explication of how the system's current configuration is a response to the sequence of actions that has led up to this moment, and a step on the path toward completing the larger action in which it is engaged' (Dourish 2001, p.84).

One way of following up the matter of technomethodology lies in the notion of prototyping. On the one hand we can refer to the concept of the prototype in cognitive science where it stands for typical semantic categorisations of everyday objects.[8] In this sense prototypes serve as media or indices of accountability arising out of folk theories or exactly of the very notion of ethnomethodology, namely the understanding of everyday practices (methods) of the ordinary people (folk). On the other hand we can refer to the concept of the prototype in industrial design, where it refers to the first model of a product before the launching of industrial mass production. This version brings out a rather static picture of a prototype as a specimen produced in advance. Since action is a practical process and computers do not participate in actions in a passive way, information visualization and interaction styles of the interface cannot be conceptualized as mute objects or dumb waiters. Objects too have agency (cf. Latour 2005, p.63ff). In a way we have to deal with a never-ending process of sensemaking which implies an infinite prototyping phase.

Prototyping is just another name for this process of testing arrangements of the agents involved. It experiments in the field of considerable latitude opened up by the need to handle contingencies. An important aspect of prototyping is to frame the problem and then to explore the ins and outs of the situation at stake. Since everyday situations are always transitory, we could put forward the idea that prototyping has to orchestrate the interplay of the agents involved. Thus prototyping can be seen as the perpetual and iterative process of finding balanced relationships between the agents involved. Prototyping is the procedure of giving an account for the actions in the here and now. Perpetual prototyping, like

[8] The original reference for the idea is Rosch 1973.

non-intentional design, 'refers to the day-to-day redefining of the defined' (Brandes and Erlhoff 2006, without paging).

Conclusion

Information technology induces a new kind of literacy which has to deal with phenomenon of *everyware* computing. In the post-PC area we are challenged by new forms of computing which simply cannot be reduced to concepts of dyadic human-computer relationships as conceived of in ergonomic and cognitive approaches in human-computer interaction. Everyware demands new ideas and concepts for developing interfaces in keeping with the times. This is why I shift the focus to workplace studies designed in accordance with ethnomethodological approaches. They offer remarkable contributions to grasping the role of information technology in day-to-day organizing. Both human beings and computers are considered as interplaying and interacting participants of work ensembles which carry out actions in situ. So I introduced technomethodology as a fruitful step towards future design conceptions. In a paradoxical way technomethodology offers both more and less than instructive insights for interface design. On the one hand it proposes the new foundation of a hybrid discipline which is about to revive and renew the traditional assumptions of design. The traditional frame of reference of interface design is no longer taken for granted but called into question. On the other hand it is incapable of simply adding an instrumental support or a new method. In other words: Technomethodology is not a toolbox but a new way of thinking about interface design.

Maybe I have asked more questions than I have answered. But to call into question so-called common-sense assumptions in human-computer interaction is a good means of reflecting upon well-trodden paths and may lead to new descriptions of possible relationships between human and non-human beings. Such a policy of re-describing traditional descriptions from another point of view entails innovative forces. In times of emerging new information technologies it is unsound advice to stick to rather outdated concepts without bearing in mind alternative options. As Coyne (2005) puts it, re-visiting and re-describing wicked problems again and again is not a hopeless task but helps to bring forth an adequate understanding. We are only at the beginning of describing human-computer interaction in terms of technomethodology, but I think continuing on this tangled path is well worth every effort.

'The task is to imagine methods when they no longer seek the definite, the repeatable, the more or less stable. When they no longer assume that this is what they are after' (Law 2004, p.6). As in picture puzzles, ambiguity ensures that the (re-)search is going on by oscillating between different accountable possibilities.

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ORDER AND DISORDER IN KEYBOARDS - MEMETICS OF TYPING

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Abstract

The main purpose of this study is to introduce and explain the terms 'meme' and 'memetics' with a brief description of the principles of natural selection and survival of the fittest rule in Biology. It also shows that memetic and genetic evolution are subjected to the same basic principles. With the help of memes, the study focuses on the idea that the principles of evolution of Industrial Product Design ideas work similar to the principles of natural selection in Biology and analyses the world of Industrial Product Design from a Darwinist point of view. Therefore, design ideas are presented as memes, mostly built on previous ones within the case study of typing including keyboards, keyboard layouts, and some functional keys. Typing is analysed as a transmitted and a settled behavioral pattern, the memetics of QWERTY keyboard layout and the Shift key meme is put into practice, analysing the mechanical, electric, and digital phases of these memes. As a conclusion, the study suggests Biology and memetics to be put to practical use in Industrial Product Design world beside other sciences.

Memes and Memetics

The term *meme* was invented and first introduced by Richard Dawkins -a Darwinian zoologist- in his book The *Selfish Gene* in 1976. Briefly, Dawkins explains biological evolution which does not happen for the good of the species, nor for the group or the individuals. It is purely for the benefit of the genes themselves. Although selection takes place largely at the individual level, it is the information in the genes that is copied. They are the replicators and it is their competition that drives the evolution of biological design (Dawkins 1989). "A replicator is something that copies itself, though not always perfectly. The environment must be one in which the replicator can create numerous copies of itself, not all of which can survive" (Blackmore 2000a: 114). The DNA coded 'selfish' gene is not the only replicator on this planet according to Dawkins; he introduces the other 'selfish' replicator; the *meme*:

> Examples of memes are tunes, ideas, catch-phrases, clothes fashions, ways of making pots or building arches. Just as genes propagate themselves in the gene pool by leaping from body to body via sperms or eggs, so memes propagate themselves in the meme pool by leaping from brain to brain via a process which, in the broad sense, can be called imitation (Dawkins 1989: 192).

Memetics is the study of memes and their social effects (Grant 1990). It deals with the evolutionary models of information transmission. "Memetics is all about why some memes spread and others do not" (Blackmore 1997: 45). It extends Darwinian evolution to culture. Though memetic and genetic evolution are subjected to the same basic principles of blind variation and natural selection, memetic evolution is basically a much more flexible mechanism. Memes are equivalent to genes in a way but that does not mean that memes can only work if they are like genes in every way (Blackmore 1999b).

Memes as Replicators

Darwin's principle 'natural selection' requires three main features; **variation**, **selection** and **retention** (heredity). If there is 'variation' among the offspring then not all the creatures would be identical, second not all the offspring can survive, there must be an environment in which some varieties do better than others, which is called 'selection'; and finally the

survival offspring having some special characteristics is passed on to the next generation which is called 'retention (heredity)'. Then it returns to the start again.

The three main features; variation, selection and retention, leading to evolutionary algorithm are to count something as a replicator. If memes are also replicators and can sustain an evolutionary process, those principles must be valid for them too:

1. Memes have **variation**, for example, stories are not generally told exactly the same way twice which means when a meme is passed on, the copying is not always perfect.

2. Secondly, there is memetic **selection**, some memes are good at being copied, they are successfully passed on, but some do not even grab attention and fail to get copied between people.

3. Finally, there is **retention** of some of the ideas in the memes that are passed on;

something of the original meme is retained. The meme therefore fits into Dawkins's idea of replicator and the evolutionary theory (Blackmore 1999b).

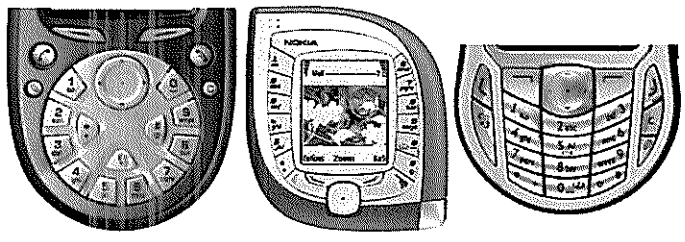


Figure 1. Some earlier Nokia mobile phone keypad 'variations'

(Source: http://www.gsmshop.nl/shop/shopimages/Nokia3650_cover_SKR324.jpg
http://www.gsm4u.ru/img/phones/Nokia_7600.jpg
http://www.mundosemfio.com.br/images/jorge/Nokia6630.jpg)

1	2	3
4	5	6
7	8	9
*	0	#

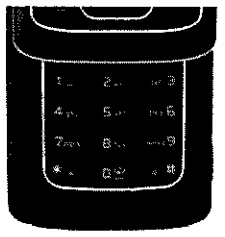


Figure 2. The 'selection' and the 'retention' of today's Nokia mobile phone keypad, a recent model; Nokia 6288
(Source: http://www.nokia.com.tr/id97420.html)

An Example; Modernist Architecture from a Memetics Point of View

There is no rule stating; the successful memes are 'always' good, useful, true, beautiful, ergonomic, aesthetic, practical, functional etc. For example; for Salingaros and Mikiten modern architecture - in spite of its announcement and acceptance as being perfect - roughly does not answer the physical and psychological needs of human beings (Salingaros and Mikiten 2002).

They explain how once memes have been encapsulated and institutionalized they acquire a rigidity that makes them extremely difficult to remove. From that perspective, they bring forward some explanations for the remarkable persistence of modernist architecture and urbanism in spite of their negative aspects. Taking the meme's eye view on, they review modernist style of architecture - otherwise called the *International Style* - that has been the overriding building style from the 1920s until 21st century. The style is easily recognisable by its geometry of cubes and rectangular slabs; flat plain surfaces; the lack of thick connective boundaries; the use of steel, glass planes, and concrete panels; and in many cases the elimination of color and structure on the human range of scales 1mm-1m. They compare modernist architecture to military and prison architecture and show some stylistic similarities between them: defense installations and castles (experienced from the outside), dungeons, prisons, crematoria etc. (experienced from the inside) (Salingaros 1995). Representative buildings include the Bauhaus building (1926) by Walter Gropius; the *Pavillon Suisse*, *Cité Universitaire* (1932) and *Carpenter Center for the Visual Arts* (1961) by Le Corbusier; *the Casa del Fascio* (1936)

by Giuseppe Terragni; the *UN Headquarters* (1950) by Wallace Harrison and Max Abramovitz; the *Seagram building* (1958) and the *Neue Nationalgalerie* (1968) by Ludwig Mies van der Rohe; and the *National Theatre* (1967) by Denys Lasdun (see Fig. 3 - 6).



Figure 3. Pavillon Suisse, Cité Universitaire (1932) by Le Corbusier and Dover Castle, England (Sources: http://www.sciences-sociales.ens.fr/hss2001/logement/galerie/leCorbusier.html http://www.dover-castle-friends.org/fodc/Home.htm)

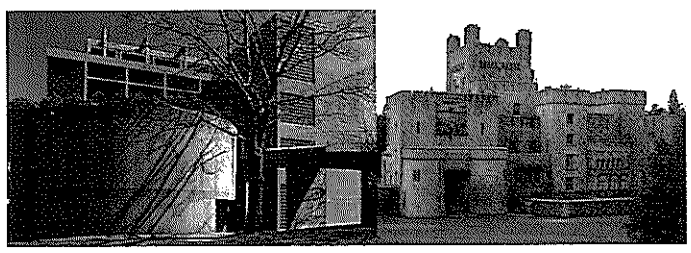


Figure 4. Carpenter Center for the Visual Arts (1961) by Le Corbusier and Gosford Castle (1850s), England (Sources: http://www.worldandi.com/newhome/public/2003/august/arpub.asp http://www.gosford.co.uk/castle6.html)

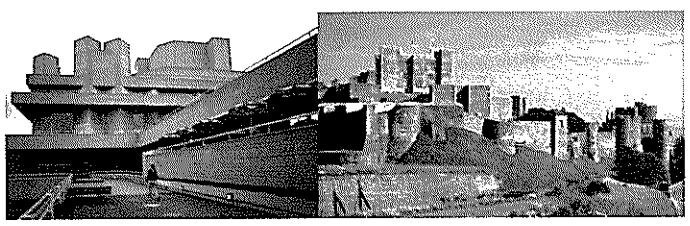


Figure 5. National Theatre (1967) by Denys Lasdun and Dover Castle, England (Sources: http://www.bluffton.edu/~SULLIVANM/england/london/lasdun/theatre.html http://keep3.sjfc.edu/students/fmw7062/unitplan/dovercastle.htm)

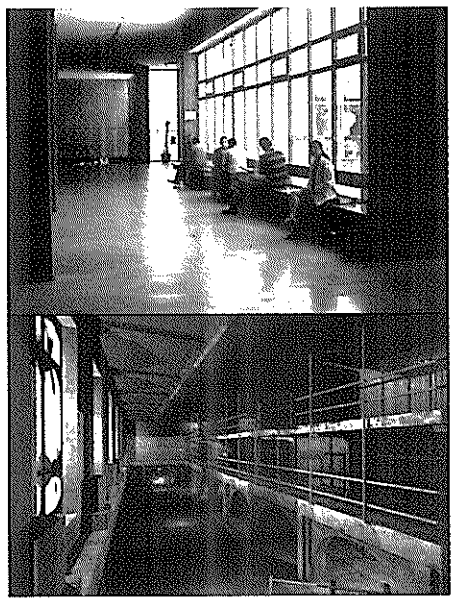


Figure 6. Faculty of Architecture in Middle East Technical University; inside view - 2nd floor and inside of a prison (Source: http://www.shadowspawn.net/temp/tc_prison.jpg)

Universal Darwinism and Industrial Design

Universal Darwinism (first introduced by Dawkins) is applying evolution and its principles to several different fields of enquiry. It can be applied to any system that has variation, selection and heredity. The fundamental principle of Darwinism is this:

> if living things vary in ways that affect how well they can survive, and if they produce more offspring than can possibly survive, and if the few survivors pass on their characteristics to the next generation, then the characteristics that helped them survive will be more common in the next generation. That is, the members of the next generation will have evolved in some way compared with the previous one; they will be better adapted to the environment in which the selection took place.

Let us replace some words with the terms of design:

> if designs vary in ways that affect how well they can survive, and if they produce more variations than can possibly survive, and if the few survivors pass on

their characteristics to the next generation, then the characteristics that helped them survive will be more common in the next generation. That is, the designs of the next generation will have evolved in some way compared with the previous one; they will be better adapted to the market in which the selection took place.

There are 8 premises which evolution is based on: (To apply the evolution system to any population a biological entity is not necessary, it just should compete for resources, have unique characteristics, can reproduce, produce offspring that inherit their characteristics and whose offspring might be different (Silby 2000a)).

1. In ideal circumstances (limitless resources), populations will grow exponentially.
2. Resources are limited.
3. Individuals within a population have unique characteristics.

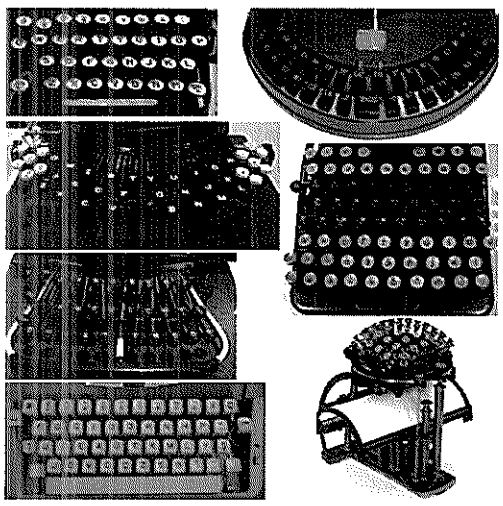


Figure 7. Different typewriter keyboards having different characteristics

4. An individual's characteristics are passed on to its offspring (inheritance) (Figure 8).
5. Change can occur, and this sometimes results in offspring having slightly different characteristics to their parents. (Figure 9).
6. Given the fact that individuals have varied characteristics, it is reasonable to suppose that some individuals will have characteristics that give them a better success at acquiring resources and reproducing (Figure 10).

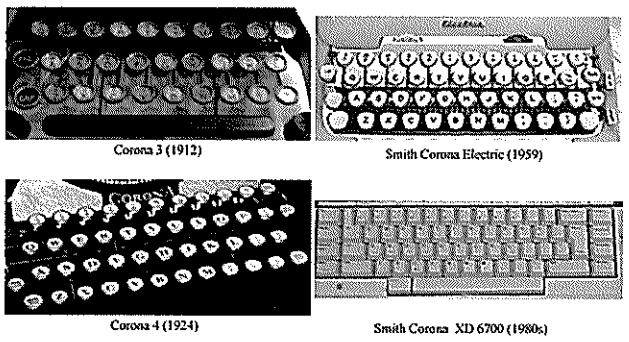


Figure 8. The inheritance of the QWERTY keyboard layout within Corona typewriters and word processors.

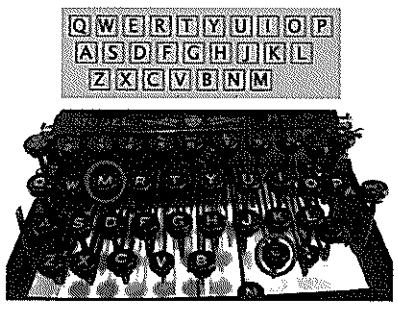


Figure 9. Pittsburg No.10 typewriter (1898) presenting the QWERTY keyboard (which was first introduced in 1874 by Remington) with a slight change (Source: http://ednixon.com/pix/2003/typewriters/Pa136415.jpg)

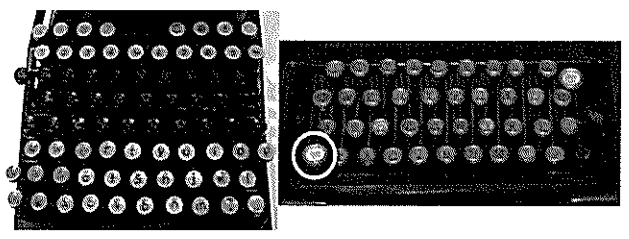


Figure 10. The huge keyboard of a mechanical typewriter having both capital and small letters on its keyboard and another mechanical typewriter keyboard - similar to today's PC keyboards - having only one type of letter on its display but presenting a shift key (in white circle) in order to 'shift' between upper and lower cases. It is clear here which type of keyboard was successful at acquiring resources and reproducing

7. Characteristics that enhance an individual's survival and reproductive success will be passed on to subsequent generations – 'survival of the fittest' – natural selection.

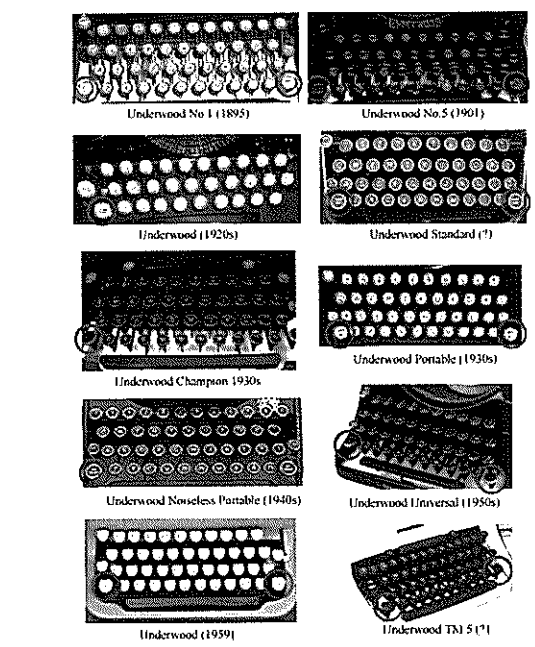


Figure 11. The keyboards of Underwood Typewriters; Shift key was an important characteristic that enhanced the typewriters' survival and reproductive success that had been passed on to subsequent generations.

8. Populations that possess above characteristics will evolve from simple to complex and from homogeneous to heterogeneous characteristics (Silby 2000a; Herbert 2000).

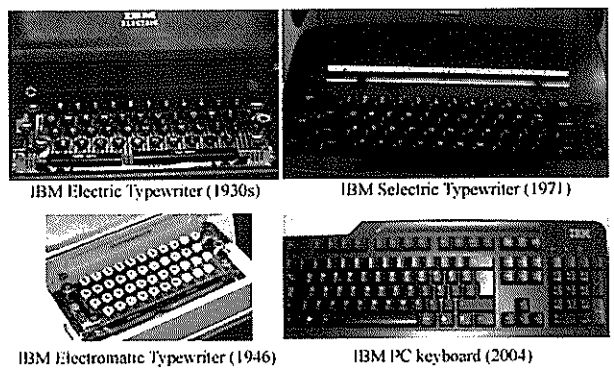


Figure 12. The evolution of IBM keyboard

Design as an Evolutionary Process

Since the prehistoric ages till today, design has always followed an evolutionary process. For example; let us say one of the first human beings found a sharp edged stone and used it as a weapon or a cutting tool, some others saw him and found stones similar to his and sharpened its edges more by the help of another stone. Someone from another tribe maybe took that sharpened stone and tied it up at the end of a stick and it went on like that. It is not possible to say that in the end of that imitation and interaction, the perfect weapon would be invented. This is not what happens when it is said **evolution of design**. The ideal form or the perfect form does not have much to do with evolution; evolution brings about change and adaptation, but it does not necessarily lead to progress or advancement, and it does not necessarily leads to perfection (Yagou 2005).

Design ideas and/or the human behaviour formed that ideas, are the **replicators** that made humans create the surroundings around them. Therefore, the principles of replication in biological evolution and the principles of natural selection might be applied to design ideas too. The circumstances of the environments people live in always change and the requirements for survival also alter through these influencing factors, so according to those changes, convenient solutions are produced. Some of these solutions survive and some of them do not. The survived solution does not have to be successful by means of design; but it has to be successfully repeated, like genes in biology.

The role of evolution in design is significant. There are numerous successful design examples which result from an evolutionary process, by making successive slight modifications over a long period of time, not through making frequent obvious changes for the sake of offering something which looks 'really new and different'. Just like the evolution of organisms, the evolution of design is a natural process too (Pye 1978). However, this process should not be confused with 'copying'. Producing identical copies does not suffice to generate the diversification and variety, which is necessary for selection to be applied (Yagou 2005).

Re-design

"... every picture owes more to other pictures painted before than it owes to nature" (Gombrich qtd. in Michl 2002).

It may seem odd but, designers, in practice, can not start from scratch generally. On the contrary, it can be said that designers start off where other designers (or they themselves) have left off which means design is also something about improving earlier products, and that designers are thereby linked to earlier objects, or actually to their own or their colleagues' earlier solutions - and thus to yesterday. This is how it was in biological evolution. (Michl 2002: 14)

George Basalla argues this deeply in his book The Evolution of Technology (1988). Basalla sheds light on evolutionary history of design and technology emphasizing on: "Any new thing that appears in the made world is based on some object already in existence" (45). He builds an evolutionary explanation of how steam engines, hammers, trucks and transistors have come about. He emphasises the slow progressive process of change through imitation and variation. For example, many features of wooden buildings were reproduced in stone by the Greeks, the first iron bridge built in the late 1770s was modelled on woodworking practices, and even the plastic bucket often still shows signs of its origins in metal. 8asalla questions the idea of technology progressing towards grand goals such as 'the advancement of humanity' or the 'the overall betterment of the human race'. He depicts the relation of evolutionary perspectives and artifacts which are included in the design domain.

In public perception, design is typically regarded as the act of talented people creating some nice forms. Design is not always just an individual's creative activity, but creativity with a collaboration of the past and the future. To redefine design, it can be focused on the word 'design' itself. The word itself is lack of some perspective, which is the collective, cooperative and cumulative dimension of design. Michl suggests considering the word 'redesign', which has the advantage of containing the word 'design' already. If it is accepted that functionality of artifacts is always the result of step-by-step improvements to the tools available at any time, then the origin of any intelligent contrivance becomes easier to understand (Michl 2002).

Evolutionary Design Practices on Typing - the Memetics of the QWERTY Layout and the Shift, Ctrl and Alt Keys

One of the examples for the **replicating behaviour** through generations is typing. When the subject is typing the main product to be examined is the **keyboard**. Today keyboards are commonly seen as auxiliary equipments that are connected to computers. It is the device used to enter information and instructions into the computer. Most keyboards have all the letters of the alphabet, numbers 0 - 9 and additional special operational keys. Most of the keys, their functions and locations derive from the antique mechanical typewriters which are not used today.

The Mechanical Phase

The evolution of the 'writing machine' from early 18th century concepts to the modern electronic typewriter represents a rich history of efforts by many individuals in several countries. The idea of the typewriter can be traced to the early 19th century. Until 1874 – the time when the QWERTY layout was presented; the first six letters of the keyboard layout of the first commercial mechanical typewriter - there had been different ideas of typing apart from the common keyboard type used today.

The first commercial typewriter was introduced to the U.S. market by Remington in 1874 as the 'Type Writer' (see Fig. 13) which was evolved from the unit invented and built by Sholes and Glidden in 1867. The 'Type Writer' was heavily influenced by the workings and the appearance of the sewing machine, which was also produced by Remington.



Figure 13. Sholes Typewriter (no shift key) – Remington, 1874 (Source: http://www.officemuseum.com/IMagesWWW/1874_Sholes__Glidden_NMAH_SI_OM.jpg)

This early typewriter had its limitations; it typed invisibly (the operator could not view the result while typing) and printed only in capital letters (Shift key appeared on the keyboard of Remington No.2) (Beattie & Rahenkamp 1981). However, the most important point about Sholes Typewriter was the presentation of the QWERTY layout to the market.

How did QWERTY layout designed? Before 1874, while Sholes was working on typewriters, there were some problems with the printing mechanism; the key slugs would easily get jammed when a key was pressed before the previous one had returned. Sholes solved this problem by experimenting with the most common English two-letter sequences and assigning the most frequent couples to opposite sides of the keyboard. This resulted in the QWERTY layout (see Fig. 14), which was optimal in avoiding key jamming (Buzing 2003).

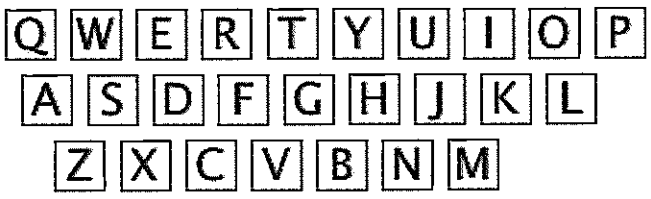


Figure 14. The QWERTY layout layouts were not QWERTY (Sources: http://www.maquinasdeescreverantigas.com.br/fotos/hammond%201.JPG
http://www.portabletypewriters.com/blickensderfer_front_closeup.gif)

The QWERTY layout is a typical visual memetic pattern, which had been active for 133 years and it still lasts. It has been accepted as the universal or the standard keyboard design in English-speaking countries around the world today. Some reasons behind QWERTY layout's great initial advantage are its presentation on the first commercial typewriters that entered the business offices and the huge number of typists that Remington Company trained for this keyboard (Buzing 2003). Throughout the typewriters evolution, the Shift key was one of the first special keys which have been added to the keyboard layout. In order to print both upper and lower case letters with a single letter key, two typefaces were placed on each type-bar. When a letter key was operated within a platen-shifting mechanism, either the upper or the lower case version of the letter could be chosen to print. It was in 1878, Remington No.2 Typewriter had a shift key on the left bottom corner of the keyboard and since that model, nearly all the mechanical and electric typewriters had shift keys (see Fig. 15). It was a real ease to write both lower and upper cases with one layout, otherwise there had to be a doubled keyboard (see Fig. 16).



Figure 15. Remington No. 2 Typewriter (with its shift key), 1878 (Source: http://www.officemuseum.com/1878_Remington_No._2_front_OM.JPG)



Figure 16. A doubled keyboard typewriter (no shift keys)

Like the **variety** in biological evolution, there had been various designs of typewriters, keyboards and keyboards arrangements in the market. For some reasons typewriters like Hammond and Blickensderfer (see Fig. 17) could not threatened the market-leading position of Remington. Maybe it was because Blickensderfer did not have the production capacity that Remington had, or the early QWERTY market penetration gave Remington a slight but decisive advantage. In addition, the Remington typewriter had won some important typing contests. These competitions were very common those days, for example the famous Cincinnati contest in 1888, which was won by Remington's star typist Frank McGurrin. The New York Times stated that this victory made clear that the Remington machine (with its QWERTY keyboard) was technically superior which makes the QWERTY arrangement superior. This was the best kind of advertisement that Remington could wish for and it put many competitors out of business. In fact, it is said that the performance differences were rather small (Buzing 2003). This way or that way ***selection*** was made through variety; some ideas have died some have survived. Remington was selected, so was the QWERTY.

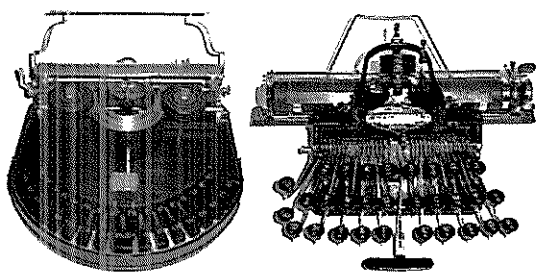


Figure 17. Hammond 1884 (left) and Blickensderfer No.5 1893 (right), their keyboard

In 1895, the Wagner and Underwood Company (see Fig. 18) produced Underwood No.1 typewriter. It was the one which developed the style known today. It was the first modern typewriter having superior technical features, shared by all subsequent typewriters. In addition, it was put on the market with its QWERTY keyboard and shift keys on it. This can be called as the ***retention (heredity)*** of the QWERTY and the shift key memes. It is simply Darwinian and it is analogical to biological evolution; characteristics that enhance an individual's survival and reproductive success will be passed on to subsequent generations – 'survival of the fittest' – natural selection.

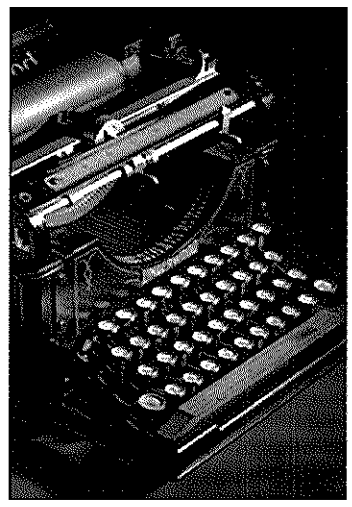


Figure 18. Underwood No.1, 1895
(Source: http://www.makingthemodernworld.org.uk/everyday_life/work/1880-1939/TL.0376/)

After being the dominant one in 1890, many alternative layouts continued to appear against QWERTY claiming to be more efficient and faster thus superior. The most famous alternative was the Dvorak's Simplified Keyboard (see Fig. 19) patented in 1932. Nevertheless, whatever had been claimed, the QWERTY meme had always been the fitting meme through the design of typewriters and keyboards after a certain time. Even though the QWERTY layout is not yet proved to be the most efficient keyboard layout possible, as a meme - efficient or not, ergonomically correct or not (these are not the cases here) – it had been a ***successful replicator*** and gained success through the meme pool against the other memes (layout designs). It was successful because it managed to replicate itself; this increased the possibility of being the ***fitting meme*** under the conditions of the existing environment.

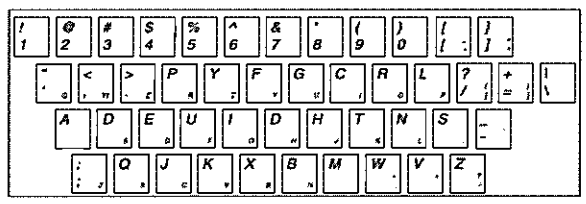


Figure 19. Dvorak's Simplified Keyboard; the most popular alternative to QWERTY keyboard (the small letters in the corners represent the QWERTY layout)
(Source: Buzing, Comparing Different Keyboard Layouts)

This case is similar to the competitions between recording systems of VHS and Beta. There were no real technical differences initially between Beta and VHS even though some claimed Beta is better. This is also similar to the contention between the operating systems of Macintosh and Microsoft-DOS. Most of the people consider what the people around them choose or likely to choose. This helps memes spread also. Economists call this network externality, which means the value of the good depends in part on how many other people it can connect to (Katz & Shapiro qtd. in Liebowitz 1994).

Changes in the mechanical typewriter design have evolved over time. Through many innovations, these limited mechanical devices were to evolve into sophisticated electronic typewriters with improvements. Some of the important improvements were the shift key mechanism, visible writing and portable typewriters. There were numerous different designs; but whatever has changed the QWERTY and the shift keys kept on 'living'. They were successful memetic patterns. Following figures show different times' mechanical typewriters with their QWERTY keyboards and shift keys, and also a French and a Turkish typewriter with their shift keys. Shift key was such a successful meme; its location and its mission were always transferred even though the layout of the keyboard was different from QWERTY.



Figure 20. Williams No.6 (1904) and below Franklin (1891)
(Source: http://ednixon.com/pix/2003/typewriters)



Figure 21. Corona 3 (folding) (1912) and below Bing (1927)
(Source: http://ednixon.com/pix/22003/typewriters)

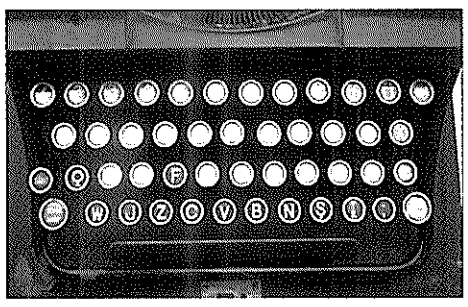


Figure 22. Above Torpedo (1920s) with its French keyboard layout and below Patria with its Turkish keyboard layout different from QWERTY and with their shift keys placed the same as most of the typewriters.

The Electronic Phase

Another advance in typewriters came with the development of the electric typewriter. The advantage of an electric machine was greater speed and legibility. The first commercially successful electric typewriter put in the market had presented QWERTY layout and shift keys on its keyboard, like mostly used mechanical typewriters. It was marketed by IBM as the Electric Typewriter Model 01 (Improved) in 1935.

The shift key meme and the QWERTY layout meme were again successful at replicating themselves in the era of electric and

electronic typewriters and word processors. As the shift key was located on the left bottom of the mechanical typewriter's keyboards, it was also commonly located on both the left and right hand side of the electric and electronic typewriters too; below the caps lock and enter/return key. The shift key was again used for typing capitals and special characters. Following figures are some examples to this electronic era of the QWERTY and shift keys.

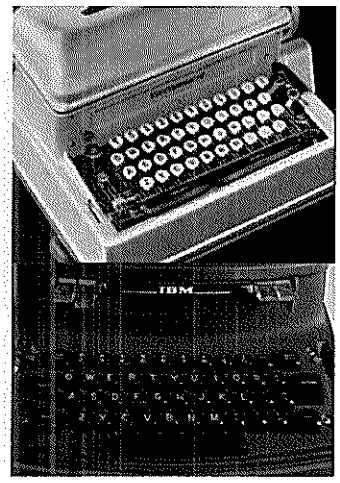


Figure 23. IBM Model 04 (1947) and below a prototype of IBM Model A (1940s)
(Sources: http://www.etypewriters.com/1947-04.jpg
http://ednixon.com/pix/2003/typewriters/Pa136452.jpg)

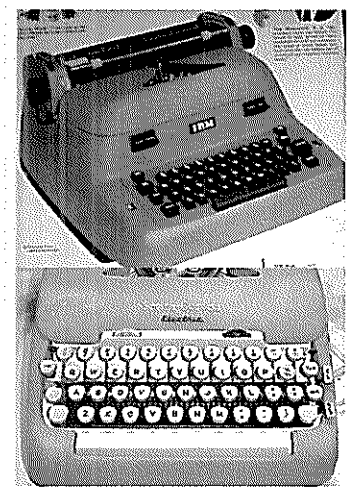


Figure 24. IBM Model A (1950) and below Smith Corona Electric (1959)
(Sources: http://www.etypewriters.com/1950-a-1.jpg
http://www.portabletypewriters.com/smith_corona_5le_htm.htm)

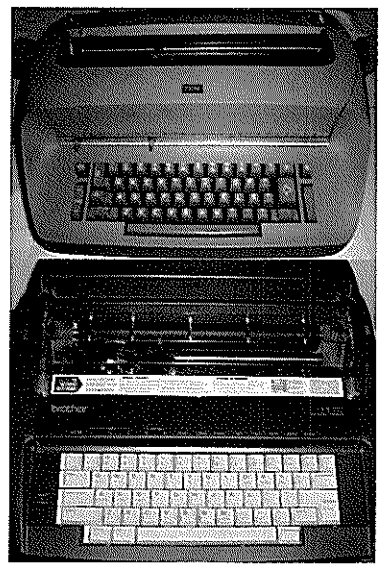


Figure 25. IBM Selectric 1961 and below Brother AX-325 (?)
(Sources:
http://teclasorg.coolfreepage.com/col_IBM_Selectric.htm
http://www.bestoffer.com/pages/General/IDetail.jsp?item=15495)

The Digital Phase

After the keyboards of the mechanical, electric and electronic typewriters, the QWERTY layout and the shift keys had been 'transferred' also to the computer keyboards with other keys. Computer keyboards have changed very little in layout since their introduction. In fact, the most common change has simply been the natural evolution of adding more keys that provide additional functionality. As a gained characteristic which enhance the keyboard's survival (one of the basic premises of evolution), the presence and the location of the shift keys did not change; on the left and right hand side, below the caps lock and enter/return key. Although layout did not change much, computer keyboard designs have presented interesting solutions time to time (e.g., the split left/right layout, adding a ten-key pad), but the QWERTY letter arrangement continues to be used. Following figures show some keyboards of different periods and the evidence of the ***heredity*** of QWERTY layout and shift keys through the evolution of technology in digital era.

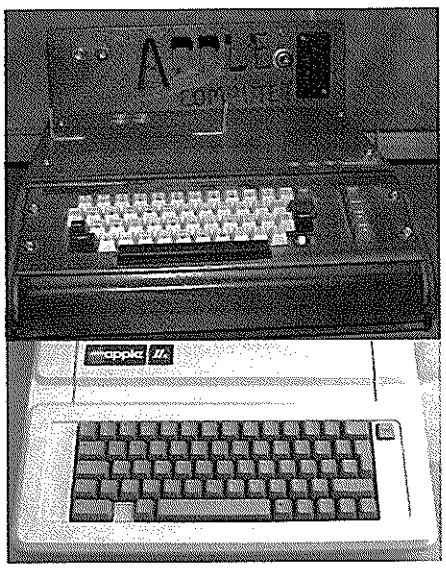


Figure 26. Apple I (1975); the first PC and Apple II Enhanced (between 1979-83)
(Sources: http://www.apple2.org/aboutimages.html http://computermuseum.50megs.com/images/collection/apple-IIe.jpg)



Figure 27. Apple Adjustable Keyboard (1992) and Fountain Hills FH201 PC keyboard
(Sources: http://tim.griffins.ca/gallery/keyboard/all.html http://www.farclip.com/hardware/images/Apple_AdjustableKeyboard-M1242.jpg)

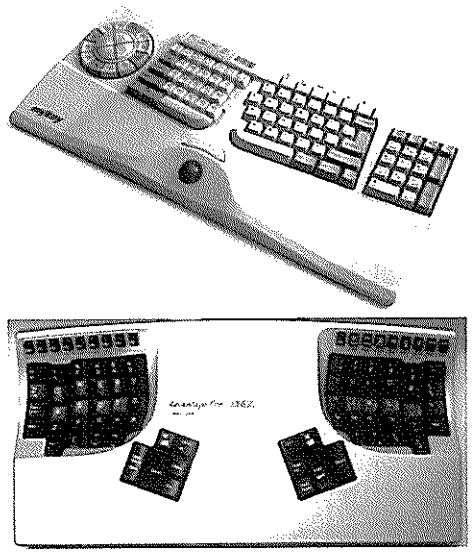


Figure 28. The MyKey PC keyboard and The Kinesis Advantage Pro PC keyboard (2003)
(Sources: http://tim.griffins.ca/gallery/keyboard/all.html http://www.atpm.com/9.01/kinesis.shtml)

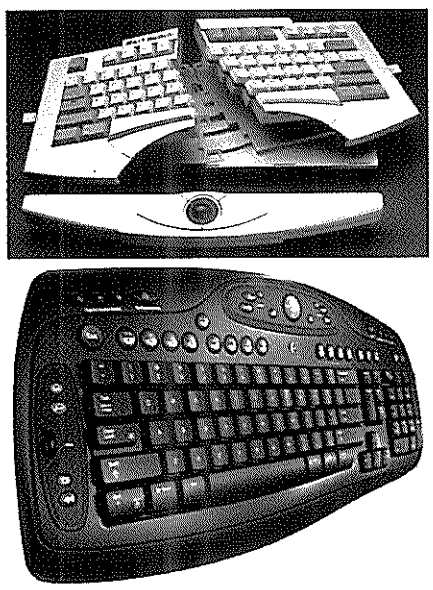


Figure 29. ErgoMax PC keyboard and Logitech Cordless Desktop LX (2000s)
(Sources: http://tim.griffins.ca/gallery/keyboard/all.html http://www.yenra.com/cordless-keyboard/cordless-keyboard.jpg)



Figure 30. Dell Inspiron 3200 Notebook Keyboard and Folding Palm PC keyboard
(Sources: http://www.foldingkeyboards.com/Palm%20Keyboard%20W_400.JPG)



Figure 31. HP iPAQ Pocket PC – mobile phone (2004) and Nokia 9300 SmartPhone (2004)
(Sources:
http://www.mobiletracker.net/archives/images/9300_3.jpg
http://www.gizmodo.com/archives/images/nokia_9300_large.jpg)



Figure 32. Examples for virtual keyboards; a Palm PC and Siemens mobile phone (2000s)
(Sources:
http://blog.livedoor.jp/kanta6489/archives/158855.html
http://asia.cnet.com/i/r/2004/hp/39019980/virtual_keyboard_600.jpg)

As it is seen in the above figures the shift key still keeps its location and its importance, in fact it has been doubled. It still offers a big ease since it allows combinations with other keys in order to type special characters beside its function of writing in capitals. This means, combinations with the shift key allow some special features in most of the computer programs. In the time of mechanical typewriters and electric/ electronic word processors, shift keys were there just to write capital letters and special characters, but due to the changes in the ***environment***, the shift key had to take on some other duties in order to survive in the system. Its function had been transferred beyond writing capitals through the system itself. Here are two widely known examples of the usage of the shift key within the Windows Operating System apart from word processing and forming special characters:

1. The keyboard is not the only device in the system of interaction with the computer; there is also the 'mouse'. If there is no mouse then a touchable screen is needed. Therefore, the

shift key also has a relation with the mouse beside other keys. For example, within Internet Explorer (the default web browser) while a web page is viewed, it can be used to open another link presented in that page in a new window. If the new link is clicked while holding down the shift key, the web page will directly be opened in a new window. It is like a short cut.

2. Another widely known example would be the delete command. A file, a folder etc. can be deleted 'permanently' by shift key + delete key. Otherwise the file would be kept in Recycle Bin folder for a period of time. Control key (Ctrl) is also similar to the shift key in function. It is located just under the shift key on computer keyboards. Control key is pressed along with other keys to perform system tasks or special tasks within an application program. It is widely used with the program Microsoft Word that is a kind of an extension of the electronic word processors. One can create and edit text and graphics in letters, reports, web pages, or e-mail messages by using Microsoft Word. There are some keyboard shortcuts within Microsoft Word like cutting or copying (a word, sentence or a figure) in a document and pasting it into another. They are, in order, Ctrl + X, Ctrl + C and Ctrl + V. These shortcuts are also valid within other programs too. Most of the computer users are aware of these shortcuts and can easily guess that they will work within other suitable programs too, also within the operating system itself in any context e.g. editable text regions, windows explorer, desktop etc. In fact, users do not just guess them; but they expect them to work, because they are ***memetic patterns***. Those widely known shortcuts working within software for years are now transferred to the hardware also; some keyboards are produced with those shortcuts written on the keys like reminders (see fig. 33).

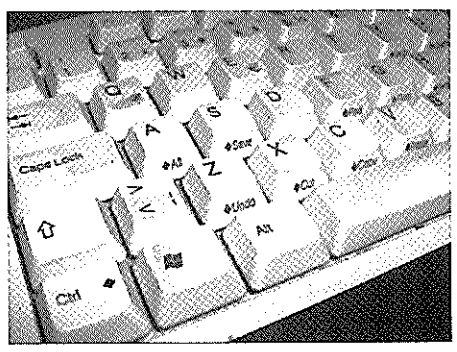


Figure 33 The keys of Vestel PC keyboard

Such uses have become the basics of the computer systems and programs. Generally, all computer users and computer program designers are aware of those, since it is simply memetic and it fits to the evolutionary system. Being aware of the opportunities of the Shift, Ctrl and Alt keys in the system, computer users also try to use those keys in every computer program possible, if it is needed. While using a computer program, when a feature or a command is newly learned, generally if it is plausible, the user would also try that command with holding down one or two of those keys too, guessing that something extra would happen regarding the command. This is because the special features of the shift key had been memeticly transferred for years. There is an expectation of a settled behaviour. As a design, those key combinations survive and *those survivors pass on their characteristics to the next generation, then the characteristics that helped them survive will be more common in the next generation.*

As examples, the programs that designers use in general can be referred to, like Adobe Photoshop. Shift, ctrl and alt keys are important keys in such programs. A very simple example to the use of the shift key would be its acting as a snap command which means it helps to draw totally horizontal and vertical lines. Drawing such lines is also possible by turning on the 'snap to all' command but it is still not as easy as just holding down the shift key. When a new user realises the easiness that shift key offers he/she would try it during the use of other commands too. Another ease is the use of the ctrl + alt keys in combination. Holding down both keys in Adobe Photoshop creates a copy of a desired layer. Of course, all those commands need the use of a mouse at the same time. As industrial designers know such combinations are also important in 3d modeling programs too, e.g. Rhinoceros, 3d Studio Max, and Catia V5. They offer important features and ease. The most interesting combination of those three keys is within the software called Alias Studio; a special program for industrial designers. In order to use this program in an efficient way, the user is directly and definitely dependent on the shift, ctrl and alt keys with the mouse.

The shift key started its *life* offering a simple combination; capitalizing letters. It worked out, and it has been transferred to the next generations. However, since the environment was changing and the circumstances were altering, in order to

live on, the shift key has become responsible for some other combinations too with some added keys like Ctrl and Alt while kept on capitalizing letters. Once the user experiences that those keys enable some extra features, he/she will try them as much as possible during the use of any other program convenient. In addition, computer program designers and product designers are aware of this behaviour too, and actually, it is this fact that lets the shift key used for years with an increasing popularity. The altering behaviour of the shift key has been transferred since 1878 and different combinations have been added to it until today.

Conclusion

Industrial Product Design, not only during the design process but also in research context deals with a wide variety of disciplines such as engineering, social sciences, humanities etc. In this paper, beside those sciences, Biology is tried to be presented as a useful science for Industrial Product Designers and design researchers to take advantage of.

During this study, the Design world is tried to be presented as a population for which the premises of natural selection and evolution are valid, thus it is regarded as a population which evolves like biological entities. Therefore, the important pattern in this population is design memes. Throughout the paper, some design memes are tried to be revealed and how memes drive the evolution of an industrial design product is tried to be presented.

Consequently,

- Memes are replicators analogous to genes in Biology which work in non-biological systems, e.g. Industrial Product Design. Thus, they work according to similar principles of natural selection and survival of the fittest rule in Biology.

- Design ideas are memes that can replicate, compete, mutate, co-evolve and may die.

- Biology as a science offers enough contribution and assistance to Industrial Product Designers to benefit from during their design processes and design researches beside Physics, Mathematics, Psychology, Sociology, Ergonomics, Anthropometry, Engineering Sciences etc.

- Typing is one of the memetic behavioral patterns which co-evolve with its design memes like typewriters, keyboards and their layouts, shift, ctrl and alt keys etc.

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THE DANCE OF DISORDER: CAN AN UNDERSTANDING OF CHAOS AND FRAGMENTATION LEAD TO A DESIGN APPROACH FOR A SOCIALLY INCLUSIVE PUBLIC REALM?

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Abstract

Contemporary approaches towards addressing issues of socially fragmented landscapes are firmly rooted in philosophies that attempt to superimpose structures of stability, order and control on to what is perceived to be an utter state of confusion and disorder. This paper investigates whether chaos theory offers potential for the development of a design approach for socially inclusive urban landscapes. It then proceeds to investigate the potential for complexity theory, or more specifically, complex adaptive systems to provide a framework for design interventions that seek to dance at the edge of chaos. The paper argues that inclusive landscapes can not be designed in themselves; socially inclusive landscapes are the products of a dynamic and chaotic growth. Finally, it investigates whether the notion of a social condensor can provide the vehicle for the insertion of design interventions that seek to evoke change through a dance of collision and chaos. It will propose that the role of the architect is to create the potential for this to occur through the design of urban fields in which this dance of disorder can occur.

Introduction

> In its expectation to find complex behavior as a result of simple systems, and in its understanding that complex systems give rise to simple behavior, in holding that the laws of complexity hold universally, caring not at all for the details of a system's constituent parts, chaos is indeed different from classical physics. Chaos theory demonstrates self-similarity, retrieving Leibniz's notion that "the world is in a drop of water" to understand, finally, that everything is connected (Alberto Pérez-Gómez 1999: 343).

The traditional notion of chaos as anti-thetical to the forces of modern planning at first brings up images of the application of anarchy to dissolve the structural nightmares created through the imposition of stability, order and control through the auspices of modern planning. Upon deeper examination, however, the implication is actually one of the imposition of notions of fractal geometry to provide a mechanism to reconcile forces of fragmentation, and through a concept that examines the notion of patterns of complexity that span across a range of scales to bring a wholeness from what first perceived to be an utter state of confusion and disorder.

Chaos and Complexity

Perhaps the most popular depiction of chaos theory as captured by the minds of the public was by Edward Lorenz in his seminal talk entitled Predictability: *Does the Flap of a Butterfly's Wings in Brazil set off a Tornado in Texas?* (1972). This provocative question actually only captures one of the properties that define chaos as a theoretical construct – that of sensitivity to local conditions.

Before proceeding any further, it is perhaps best to explore some definitions of chaos as they apply to this paper. According to the Oxford Dictionary, the origins of a definition for chaos can be traced back to notions of creation, where chaos stood for 'the formless void of primordial matter, *the great deep* or *abyss* out of which the cosmos or order of the universe was evolved' (2006). This leads to a traditional reference that frames chaos as 'a state resembling that of primitive chaos; utter confusion and disorder' (Oxford 2006). With the advent of chaos theory, the notion of chaos was redefined. No longer simply a state of utter confusion and disorder in a global sense, it began to be thought

of as the presence of phenomenon, that while still exhibiting behaviour that was inexplicable at a localised scale, could ultimately be described as an accountable set of phenomena of a larger system. In essence, chaos has become synonymous with 'the behavior of a system which is governed by deterministic laws but is so unpredictable as to appear random, owing to its extreme sensitivity to changes in parameters or its dependence on a large number of independent variables' (Oxford 2006).

As a discourse, Chaos Theory seeks to explain the behavior of non-linear dynamical systems which exhibit the phenomenon referred to as chaos. Here, chaos is the product of patterns of mathematically deterministic behavior(s), the complexity of which are unobservable at a localized scale and/or time frame. It is this inability to perceive an underlying complexity in a given system that results in the appearance of chaos (Rubinowicz 2000).

For Rubinowicz (2000), the relationship between geometric order and chaos within urban forms has resided within the formation and evolution of complex compositions since the dawn of urbanization. It is this relationship that provides an organizational tension to otherwise disparate city fabrics; which creates a sense of place in otherwise static compositions of mass and void; that allow spaces to transcend the logic of functional relationships provided for in their conception. Within this model geometry provides the organizational logic of space while chaos infuses it with a layer of complexity that provides for an 'individual dimension' (Rubinowicz 2000: 200). This relationship exists at different spatial scales, from the geometric logic of the square in front of St. Peter's basilica inserted into the urban chaos of Rome, to the individualization of doorways, balconies and window ledges imposed on the orthogonally ordered facades of the eclectic collection of mixed use buildings that line the streets of the traditional city core (Image 1).

Rubinowicz (2000) further posits that this interweaving of order and chaos is evident within the abstraction of a plan view of the traditional city, even where an orthogonal grid provides an ordering structure. The principles of this idea can be seen in the following image of a portion of the residential urban fabric of Lisbon (see image 2).[1] The area in the image is a portion of Lisbon that has evolved over the past century, with the majority of initial construction occurring prior to the arrival of modernist influences. At first glance the photo depicts an orthogonal grid of streets lined with buildings. Closer examination reveals an accumulation of plants, patios, sheds, fences and assorted structures that have evolved over time within the interiorized portions of the city blocks depicted in the photo.



Image 1. The imposition of chaos on a Lisbon street façade.

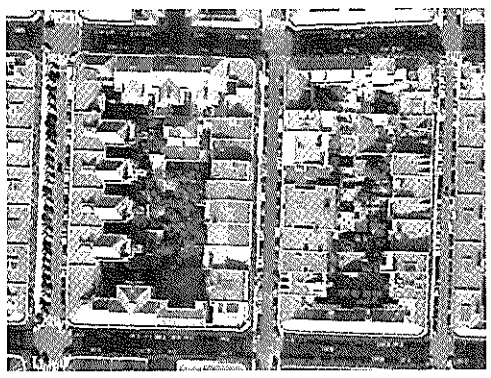


Image 2. Aerial photo of Lisbon showing the accumulation of complexity over time.

[1] The original drawings by Rubinowicz demonstrate this process of revealing chaos in built form through two examples; decomposition of a segment of the urban fabric of Barcelona, and decomposition of the façade of a tenement house, also located in Barcelona. For further information see Rubinowicz (2000), p. 202.

According to Rubinowicz the patterns evidenced in this example demonstrate the emergence of complexity through chaos; a process he defines as self-organisational in that it results through natural processes over time, as opposed to a structured ordering through the application of design principles. According to Rubinowicz, the absence of this level of spontaneously emerging detail in the urban fabric of modernist frameworks represents the failure of architectural and urban design to comprehend the importance of the fourth dimension of space in within the role of design; that of 'the creation of complex and chaotic compositions' (203).

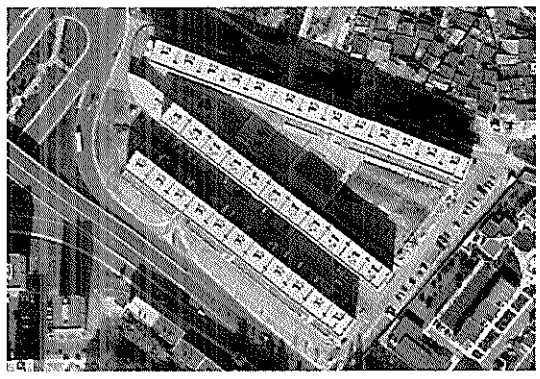


Image 3. Aerial photo of the Av. Alfredo Bensaúde housing project in Lisbon.

The argument posited by Rubinowicz is illustrated in Image 3, which depicts an aerial photo of the Av. Alfredo Bensaúde housing project in Lisbon. Located along the northeast border of the city, the project was constructed as part of an overall strategy to redress the severe housing shortages and resultant blight of shantytowns that have plagued the city in recent decades.[2] This image typifies the approach of utilizing large-scale ordered blocks of highly structured, socially planned, low-income communities that has resulted in the emergence of projects throughout the peripheral regions of Lisbon.

The essence of the argument forwarded by Rubinowicz is that chaos is a process that is dynamic and self-organizing – a principle that will be examined in the next section through the theoretical framework proposed by Mark Taylor.

Chaos, Complexity and Self-Organisation

> Clouds are not spheres, mountains are not cones, coastlines are not circles, and bark is not smooth nor does light travel in a straight line.
>
> More generally, I claim that many patterns of Nature are so irregular and fragmented that, compared with Euclid –a term used in this book to denote all of standard geometry– Nature exhibits not only a different degree but an altogether different level of complexity (Mandelbrot 1983: I).

The implications, if not outright application of chaos theory and its associated qualities of fractal geometry is evidenced in numerous architectural projects throughout the 1970's, 80's and 90's. In housing, one of the earliest examples can be seen in the Habitat 67 project, designed by Moshe Safdie for Expo'67 in Montreal. While the theoretical underpinnings of this project were still thoroughly rooted in modernism, the processes that governed the design resulted in an expression of fractal geometry. Rubinowicz punctuates his argument for the need to apply an understanding of chaos theory in design through the utilization of cellular automata software to emulate the conceptual processes of Safdie's design for Habitat 67.

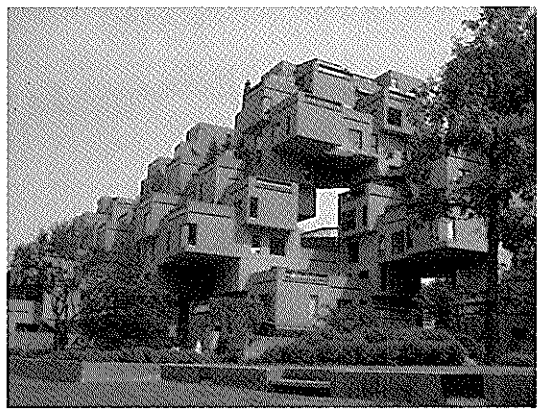


Image 4. Habitat'67 (photo by Brian Pirie, any use must credit the source as set forth in the terms of the Creative Commons Attribution 2.5 License agreement).

[2] Completed in 2001, this project consists of 357 housing units in three buildings. The informal housing visible to the north of the project is actually located in an adjacent municipality.

By running a cellular automata program informed by essential design principles for the project (an assemblage of uniform concrete cubes informed by the need for a roof garden for every unit, daylighting on at least two sides) Rubinowicz was able to derive results from the computer program that closely resembles the Habitat structure.

Fractal geometries arising from the application of chaos theory are visibly present in the de-constructionist architecture of Zaha Hadid, Daniel Liebeskind and Frank Gehry. For Taylor, Gehry was the first architect to successfully realize an expression of complexity through his non-linear design for the Guggenheim Museum Bilbao:

> The resulting forms range from the rectilinear to the curvilinear as well as from the small and intimate to the vast and overwhelming. Though clearly distinct, these forms remain intricately interconnected; indeed, it is precisely their complicated relations that articulate their distinguishing differences... Instead of preprogrammed or permanent, the order of this structure is emergent and transient (2001: 43-4).

Taylor (2001) posits that a distinction must be drawn between chaos and a condition he refers to as the 'moment of complexity' if the application of chaos is to derive meaning in design (5). Taylor notes that chaos theory is primarily focused on the investigation of determinant systems 'in which extreme sensitivity to initial conditions creates effects that are disproportionate to their causes' (13), while complexity theory is interested in the investigation of complex adaptive systems. He describes chaotic systems as determinant due to the fact that although they may result in the creation of results that are disproportionate to the initial inputs, they are still governed by definable sets of rules. This principle is evidenced by the predetermined rules utilized by Rubinowicz in his emulation of the Habitat'67 design.

Taylor points out that chaos theory developed as a response to inexplicable conditions that arose within the analysis framework of closed, linear systems thinking as defined by the principles of Newtonian physics. Chaos theory demonstrated two key principles that led to complexity theory – first, that finite linear systems are actually open systems that must be understood as incomplete; and secondly, that some open systems are defined by recursive relationships that cannot be explained by linear, causally determinate models. These non-linear recursive systems, according to Taylor, are defined by 'complex feedback and feed-forward loops' where the initial inputs are often beyond our ability to detect, thus resulting in the production of unpredictable results beyond a limited time scope, a condition we refer to as chaos (24).

Complexity theorists generally describe four distinct types of complex systems. The first type is known as a single point attractor system, where the system will always gravitate towards a single outcome, regardless of the inputs. The second system is referred to as a cyclic or periodic attractor system. This system, while being in a constant state of change where individual cycles may be atypical, is still predictable due to its cyclic nature. The third type of system is known as a strange attractor system. Characterized as the classic chaotic system in which outcomes are highly unpredictable, it is nonetheless a limited outcome system due to the fact that the individual attractors in the system are bound by predetermined rules that govern their behavior. The fourth type of system is the complex adaptive system. The characteristics that define this system are its ability to respond, adapt and change to conditions both internal and external to itself; essentially this is the definition of a self-learning system.

Complex adaptive systems emerge through intense non-linear interactions between autonomous agents that result in the creation of new system properties. Both agents and the resultant new system properties can range in scale from highly localized to system-wide in their scope. Examples of system-wide changes in complex adaptive systems are the emergence of language and cultures within human populations. The notion that system-wide change can emerge from the interaction of a single-person agent acting autonomously with other agents, be they individual or collective in their nature, across all scales of social systems is what makes it so appealing as an avenue of investigation for design.

Taylor (2001) describes complex adaptive systems as non-linear recursive systems which are in a continuous state of dynamic, evolving change, a condition that can only occur in a system that resides in a state of tension between chaos

and order. Taylor posits that meaningful, dynamic processes of change can only occur in a system that resides between order and disorder; too much order and systems tend to self-correct towards a condition of static equilibrium, too little order and systems degenerate into a non-functional state. Complex adaptive systems that reside 'at the edge of chaos far from equilibrium' (14) achieve the ideal state 'at which complexity reaches the critical condition where self-organizing systems emerge to create new patterns of coherence and structures of relation' (24).

While traditional applications of complex adaptive systems theory have focused on the natural sciences, the implications for social and cultural systems are immense. Applications of complex adaptive systems theory have already been applied across a diverse range cultural and social issues, including several studies that examine issues of inequality, marginalization and power relationships.[3] For Taylor, the notion of social-cultural structures that embrace the concept of residing at the 'moment of complexity' can best be exemplified by the emergence of contemporary network culture. Taylor begins his discussion with an examination of the underlying principles of industrial society on which the precepts modernism were based. '[T]he logic of the assembly line is obviously mechanical, serial, and linear. Separate individual, entities, and events are joined in a predictable chain where effects are proportional to causes ... in addition to establishing a division of labor, the assembly line separates managers from workers...' (29). Critical of this framework as a social structure, he goes on:

> 'The workers' day, like the assembly line, was divided into equal but separate parts. Within the all-encompassing logic of industrialization, work, leisure and rest are designed to promote efficiency and thus increase profitable production. [...] From Ford's early efforts to organize the lives of his workers and Pullman's town planning, to postwar American advertising and suburbanization, industrialists have realized that for capitalism to thrive, it must become a *total way of life*' (Taylor 2001: 29-30).

The structure which makes this all possible, according to Taylor, is the rational logic of the Cartesian grid. Tracing the history of the grid back to the enlightenment as an organizational structure of industrial society to impose ideals of universality, logic, order and rationalism, he equates the organizational principles of the grid as a structure that 'can quickly lead to a uniformity that excludes or represses everything and everyone deemed different' (31). For Taylor the grid, industrial society, and (by its association with them) modernist architecture equate to a type one complex system.

Collisions and Condensors

> When it all shakes out, the guiding real estate principle turns out to be this: telecommunications networking can add great value to localities where relatively well off people would like to live. It can remove constraints that have prevented them from doing so in the past. But it doesn't do much for localities that have no intrinsic attraction. Nor does it help people who find themselves trapped in marginalized, underserviced areas and are too poor to move (Mitchell 1999: 77).

In *Learning From Las Vegas*, Robert Venturi states: 'The emerging order of the Strip is a complex order. It is not always the easy, rigid order of the urban renewal project or the fashionable "total design" of the megastructure. It is, on the contrary, a manifestation of an opposite direction in architectural theory...' (Venturi et al. 1962: 289).[4] While in agreement with Venturi's analysis, Taylor argues that while

[3] The research conducted by Samuel Bowles and Suresh Naidu at the Santa Fe Institute provide insight on applications of complex adaptive systems theory to social and cultural issues. In particular, their 2005 paper titled "Evolutionary Dynamics of Class Structures" examines how dominant elitist structures can be explained through a stochastic complex relationship. More intriguingly, the article provides a basis for investigation as to how the introduction of an emergent complex adaptive system could disrupt a complex relationship that resides in a state of equilibrium. For more information, see http://www-unix.oit.umass.edu/~bowles/ (the paper can be found under the recent papers link).

[4] Quoted in Taylor 2001, 37.

postmodernism rejects the structures of modernism, it fails to 'explore alternative architectural forms and structures' (38). The industrial grid still dominates in the language of the architecture of automobile, the organizational structures of modern frameworks of space still order the recompositions of deconstruction. The complexities of sign and symbol, while rejecting modernism, lead to the development of 'alternative forms and structures [that reflect] a society that is no longer industrial but not yet postindustrial' (Taylor 2001: 40). It is the morphing and interweaving of the grid with the structures of the network realized by Gehry that finally realizes the evolution of architectural form to the edge of chaos required in a type 4 complex system. In her analysis of the architecture of Gehry, Amy Gilley confirms the analysis put forth by Taylor: 'It is an opportunity to question the artifices of Euclidian geometry. It is a chance to redefine the concept of landscape, to describe the iteration of form, the built form, as the iteration of the landscape' (2001: unpaginated).

While Taylor posits that the architectural form of the Bilbao Museum achieves a level of complexity that equates to the conditions required for the emergence of complex adaptive systems, he disregards the larger issue of an architecture produced for consumption within a structure that still remains enmeshed within the processes production and consumption. Conceived as a Mecca of tourism situated on the urban landscape, it fails to engage in a dialogue with issues of social inequality and marginalism that plaque contemporary urban structures. In her examination of the Vancouver Public Library by Moshe Safdie, Loretta Lees (2001) provides insight into another building that was again intended to act as a cultural icon on the landscape. Her study examines how spaces of the Vancouver Public Library has become partially interwoven into networks and webs of the layers of sub-cultures that comprise the multiplicities of urban realities through acts of subversion and appropriation. Recognising the potential to utilise the primary programmatic intent of the library to condense users in a variety of overlapping secondary programmatic elements, the building incorporates a public space that bisects the building while providing several venues that are appropriated for a range of social uses. Lees points out the composition of the population of Vancouver has undergone a major transformation that reflects its new presence on the global stage. Observing two people (a Caucasian man and an Asian woman) sitting at a table over a cup of coffee , Lees tells us of their conversation. 'He was telling her how to be Canadian [...] Soon the conversation drifted beyond what it meant to be Canadian and into a discussion of attracting the opposite sex. Before leaving the man gave the Asian woman his telephone number...' (2001: 72). Lees goes on to state that 'the library was transformed into a site in which cultural values were being worked through while playing out the mating game...' (2001: 73). Lees goes on to tell us of her experiences while in the newspaper section of the Library:

> I remember an elderly English gentleman said to me, as he rattled The Times, 'Foreign newspapers are so expensive, so with time on my hands, I'm retired, I come here to find out about hack home.' An elderly German gentleman said to me 'It's quiet here and cosy and I can catch up on events back in Germany in peace.' A Chinese woman walked around the reading-tables searching for a particular Chinese newspaper... Through their reading these users transform the library into a place of connection in which the everyday horizons are extended back or forward from contemporary Vancouver to imagined elsewheres... These connections and the meanings they give the space of the library are not pregiven but continually (re)shaped and (re)produced (73).

It is the third vignette, however that is the most poignant:

> After a coffee break and before sitting down to do some more work I decided to go to the toilet. On entering I came across a homeless woman looking under the door of one of the cubicles. [...] Perturbed, I went into the adjacent cubicle. [...] I came out [of the cubicle] and I began to wash my hands. At the same time the homeless woman began to undress and to fill the sink with soapy water. I did not stay and watch, but the woman began to wash herself as I left...
>
> This homeless woman appropriated the library for her own purposes – to bathe. She used a public space to undertake a private activity. She made a public space temporarily a private one, as evidenced by my uncomfortableness – I felt like I was intruding in her



> space. [...] This capacity to take up and transform the space of the library (toilets) eludes to the myriad of possibilities (politics of the moment) that can be taken up in the built environment (Lees 2001, 74).

The notion of social interaction and the appropriation of space for disparate agendas at a localised scale to address issues of social inequity as a form of dancing on the edge of chaos is a subject that Taylor fails to address in a concrete fashion in his work. While he does go on to examine the potentials for complex adaptive systems to change and evolve at the scale of global systems, the notion that system-wide change can emerge from the interaction of an autonomous individual or group with other agents that range across all scales of social systems is what makes it an appealing avenue of investigation for design. The potential for the complexity of social interactions to reach the critical condition where self-organising systems can emerge to create new forms of social interaction that evoke possibilities for change at the level of the neighbourhood, community and city presents an intriguing potential for design as social intervention. Nor has this area gone unexplored as a field of theoretical and built exploration in the discipline of architecture. An intriguing notion for creating the potential for an autonomous agent to create social interactions at the edge of chaos is that of the social condensor.

The concept of *social condensor* originated in the Constructivist period of the post-revolutionary Soviet State. Initiated as part of the Prolekult movement of the pre-Revolutionary Leninist vanguard of Russian social reformers, Constructivism sought to provide a platform for the generation of a new social order underpinned by the ideals of science, industry and art. Charged with the responsibility of instilling the social agenda of the State into the daily of if it's citizens, Constructivism focused on social science based processes of analysis and synthesis for the development and advancement of design theory. The objective of Constructivism was the establishment of a formal scientific methodology for the construction of buildings and services to promote the notion of Marxist ideals of social evolution that underpinned the 1917 Revolution. The formalization of the design process through scientific rigor was directed at the elimination of intuitive-based design through technological advancement. The ideals of this philosophy were embedded in two notions: the zeitgeist of the machine as the ideal for the observation and synthesis of data; and the methodological approach of the laboratory environment as the ideal for the study of rhythm, movement, time and sensory stimulation in order to formulate a design response. As a social tool, architecture was charged with the capacity to evoke social consciousness and thereby direct social change; as an architectural language it was charged with the capacity to instill on the reader an understanding of the present and an envisioning of future potentials embedded in the ideal of a collectivist culture.

While the theoretical ideals advanced by the Soviet Constructivist Movement were never seriously tested as built form, they have since re-emerged in contemporary architectural discourse. The notion of a social condensor is fundamentally rooted in the premise that architecture can be charged with the ability to influence social behavior through spatial interventions in the public realm. When the traditional Constructivist model is examined through the framework of complex systems, its reliance on science combined with its intent to instill a normative framework of post-revolutionary State defines it as a type one complex system. As the concept has advanced into contemporary architectural theory, design explorations of social condensers have explored new directions. Two principles are key to this paper. The first is the notion of embracing space, time and movement as a conceptual approach for (re)organizing space. The second is the notion of architecture as a dynamic, as opposed to static form; charged with responding to a constantly evolving social dynamic rather than bearing the iconography of the present. It is important to note that in this regard, architect becomes the facilitator of possibilities, as opposed to the inscriber of social change. The distinction is important –conventional criticism of social condensors have accused architects of indulging in social engineering– a practice that would again restrict the potential of social condensors to gravitate towards a singular predetermined outcome typically associated with a type one complex system.

Contemporary approaches to social condensers emerge in the work of the deconstructivists – most noticeably in the works of Rem Koolhaas and the Office for Metropolitan Architecture. In the book *Content*, Koolhaus describes the process of designing

a social condensor as the "programmatic layering upon vacant terrain to encourage dynamic coexistence of activities and to generate through their interference, unprecedented events" (2003, 72). Koolhaas along with Bruce Mau further investigate notions of social condensers in the books *Delirious New York* and *S, ML, L, XL*. As built form, the current approach to social condensers are expressed as the intentional overlap and intersection of programs with circulation flows to create nodes where otherwise disparate social communities will interact. Nodes in this regard are best described as points of interaction where diverse agents, agendas and programs are brought into collision. Programs and circulation are seen as flexible and dynamic, as opposed to static expressions with the intended result that these elements will foster the continual creation of new patterns of circulation nodes, resulting in the ongoing creation of new social fields. The goal in the creation of social condensors is the breaking down of the inscription of social hierarchies embedded in architectural language through the production of fields of social encounters with the intent of fostering of socially inclusive attitudes. The idea is to resist, or at least not reproduce contemporary hierarchies of social practice embedded in urban forms and fabrics.

The Dance: Bringing It All Together

> Architecture is first and foremost a cultural capital, the most tangible one, precipitating and solidly materializing in cities. If cities are the marketplace of such an invaluable resource, the need for their careful design and management is pressing. In spite of the overwhelming amount of funds allocated for the construction and rehabilitation of cities, the end result is often a low quality living/working environment due to the lack of expertise, creative thinking, and consideration for social justice (UIA Istanbul 2005 - Cities: Grand Bazaar of Architectures. International Union of Architects)

So far I have attempted to demonstrate how social condensors offer a potential framework to localise the notion of a design intent to create a field of interaction on the edge of chaos. As alluded to earlier in this paper, contemporary approaches to the design of social condensors have been limited, for the most part, to insertions into urban landscapes that can be considered to be intended for consumption. Their incorporation into spaces within public buildings that serve to function as tourist meccas severely limits their potential to act within the spheres of interaction inhabited by the marginalized and disenfranchised inhabitants of the city. As emphasised through the studies by Lees, when they do tend to function in these environments their impact attests to their ability to create collisions, however they also tend to reinforce boundaries of difference rather than create opportunity for meaningful interaction when the context in which they are located is heavily coded for consumption. Their potential remains largely unexplored within an approach that attempts to incorporate social condensors into an exploration of uncoded space that can be appropriated, reconfigured and otherwise occupied and inhabited by otherwise socially disparate inhabitants of the city. In those projects where social condensors have been incorporated into parks, plazas and other forms of civic spaces, these locations tend to be removed from the locale of peripheralized, marginalized populations.

An approach that seeks to utilise social condensors to bring meaningful design, that seeks to amalgamate disparate populations in close proximity through a field of unprogrammed urban space, that seeks to collide multiple meanings through spontaneous occupations of such space, offers interesting potential for further investigation. The principles of a type four complex adaptive systems approach invite the utilization of a design approach synonymous with the notion of a social condensor. To be successful, such an approach must free itself of conventional grid structures aligned with production and consumption. Nor can it simply replace grid structures with a vision of a network society driven by the same forces. A design approach that seeks to enfold the collisions of a social condensor field within the dance at the edge of chaos to create the potential conditions for emergence of a new form of complex adaptive system must, paradoxically, be freed of the constraints of programmatic design.

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OBJECTS FOR PEACEFUL DISORDERING: INDIGENOUS DESIGNS AND PRACTICES OF PROTEST

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Abstract

What do a piece of plumbing pipe, some wire netting, some adhesive tape, two loops of nylon webbing and a carabiner have in common? Nothing, until they are assembled, in a design. In turn, the object these components comprise comes into being only with the presence of human beings. These are the components of a device known as a 'lock-on'; some sundry objects that you would find in a builders' merchant and some people's bodies – peace activists pursuing non-violent direct action. Peace activists use lock-ons to join themselves together by the arms to enhance the power of their passive resistance. This paper identifies a number of theoretical approaches to objects of this sort. It is intended to initiate a discussion of the lock-on as an example of an 'indigenous' design that has appeared without designers, evolving as part of the practice of peace protest (Langrish 2004).

The paper concentrates on the sense of 'practice' that found in the sociological study of culture, tracing its use in the work of Bourdieu (1977) and others, summed up recently by Reckwitz (2002). Drawing as it does from a range of sources, including the social study of technology, 'practice theory' seems to have a good deal to offer a conception of design that seeks to influence the world positively beyond the point of sale. In common with other recent strands in design research such as the Participative Design that has grown out of the study of human computer interaction, practice theory acknowledges that our relationships to objects are socially important. Together with cultural knowledge and embodied skill objects form 'compounds' with people that evolve through time (Shove 2006).

This paper raises the possibility that the transforming power of designing may be enhanced if it is acknowledged that it is most powerful when it takes place in full articulation with practices. This principle is inscribed in contemporary 'user oriented' design process, but the lock-on is an extreme example of it, since no professional designers are involved in its production and its social purpose is not commercial but political. Politically engaged design is often directed at issues of sustainability and work with NGOs and these contexts for designing may be the closest in kind to that which has produced the lock-on.

A 'practice orientated' approach to design might be able to engage with the full relationship between things and the agents they imply, their bodies, their minds, the knowledge they have, the emotions they feel, the discourses they engage with. For this reason it seems to be a useful framework through which to understand an object like the lock on which has emerged out of an identifiable practice. The nature of this practice may also be inspiring in itself, as in this example, which works against crimes such as weapons of mass destruction. The paper offers an initial analysis of the evolution and current use of the 'lock-on' in UK non violent direct action as an example of an indigenous design that is part of a practice and indicates the potential for further research that would seek more fully to understand the history and development of the lock-on in order to both test the applicability of practice theory and to seek insights for designing in other contexts.

> Nonviolent direct action seeks to create such a crisis and foster such a tension that a community which has constantly refused to negotiate is forced to confront the issue. It seeks so to dramatize the issue that it can no longer be ignored (King, 2000: 77).

Introduction

It would be reasonable to assume that the words 'design theory' are an inclusive term that refers in a straightforward way to a body of ideas about the contemporary activity of designing in a professional commercial context. This is the sense in which they are used, for instance recently by Nigel Cross (2006), in a short review of key work in design research since the 1960s. From this perspective, the object of study of design research, and of the theory that comes out of it, is to better understand the processes of designing that result in configurations of material – designs – that are effective as judged according to objectives relevant to the context in which the activity takes place. Commercial objectives usually feature prominently and are sometimes accompanied by others that are more broadly 'human' (Buchanan 2001). To the extent that they seem of interest to 'design theory' these processes seem always to be more or less 'professional' – though they often involve professionals and non-professionals working together.

It would also be reasonable to assume that it is possible through such 'design theory' to understand 'designs' – things that work; objects that humans have brought into being that do something relevant to humans. This paper inspects the possibility that some types of thing, which are clearly designs because they work, may not be completely understood by such theory because they do not develop through the activities of professional designers. It discusses such an object – something called a 'lock-on' that is used in non violent direct political action. It considers how such an object might have come into existence and discusses its use by peace activists in the UK, especially those who protest against nuclear weapons at Faslane, Scotland, where Britain's armed forces keep the UK's nuclear bombs. The paper intends only to open a discussion, not to present definitive conclusions about this object, or what understanding it might tell us about design theory. Rather, the paper briefly describes the history and current use of the lock-on and makes some suggestions about theoretical approaches that might help to understand it, and their possible consequences. Of course, if the reader considers the only fit purpose for design theory to be to understand the ways in which professional designers operate, then this discussion will be of no interest. However, the facts that motivate those who over the decades have contributed to the design of the lock-on may in themselves be of interest to many.

Britain currently has four nuclear missile submarines and up to 165 warheads. Each warhead has the destructive power of up to seven of the bombs that destroyed Hiroshima in 1945; therefore Britain has at its disposal one thousand one hundred and fifty times the destructive power of that bomb, which, along with the one dropped on Nagasaki, killed three hundred and fifty thousand people, the great majority of whom were civilians. The international court of justice ruled in 1996 that the threat to use nuclear weapons would be illegal under international law. It is facts such as these which motivate peace protest and therefore the design of lock-ons. For peace activists 'locking on' means using their bodies, and some everyday hardware, to disrupt the normal running of part of the military machine with the objective of making nuclear weapons and other weapons of mass destruction an 'issue that can no longer be ignored' as Martin Luther King put it. Locking on has a relatively long history. From the late nineteenth century suffragettes chained themselves to railings in public places as they campaigned for equal democratic rights with men. Campaigners have chained themselves to a bewildering variety of inanimate objects as part of different protest campaigns since then. Besides peace campaigns the most notable among these in the UK have been campaigns by environmentalists against road developments.

This paper mainly refers to one of the variety of configurations of materials used by peace campaigners to lock themselves onto things and each other (figure 1). It consists of a piece of 150mm plastic pipe, a piece of nylon webbing or climbing rope and a carabiner – a quick release hook used by climbers – as well as the bodies of at least two participants. Despite its having human components when in use, and only coming into existence when it is used, campaigners do refer to this configuration of pipe, webbing and carabiner as a lock-on. Its use in direct actions involves the participants locking themselves together by inserting their arms into the tube and connecting their wrists with the webbing and the karabiner. This makes their passive resistance to being moved out of the way more effective, since they are joined together in groups. The security forces can separate them against their will but only by cutting through the thick plastic of the pipe to get at the karabiner. They use saws to do this and presumably for this reason the tube is often covered with wire netting and then industrial tape to keep its construction concealed and increase the time it takes to forcibly unlock the participants.

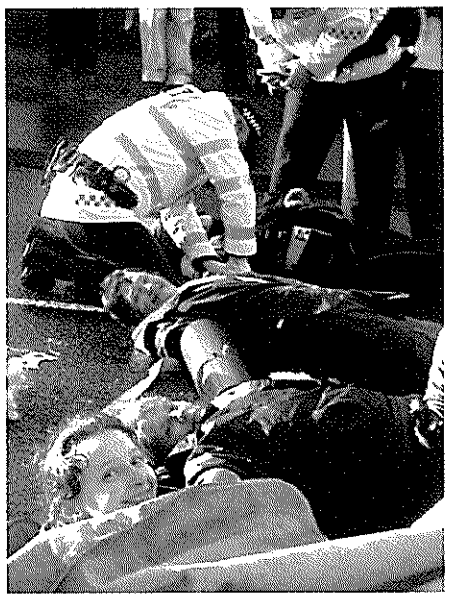


Figure 1. Lock-on in use at Faslane, Scotland, 2006 (Faslane365)

As well as being the product of a non-professional design process, the lock-on might seem like an unusual sort of object to consider in the academic study of design because it is also not a discrete object but is made up of people's bodies along with its inanimate components. In order to exist it requires the presence of the bodies of the peace campaigners who use it to 'blockade' a military site. The lock-on clearly is 'a design' in that it is an arrangement of material in a form that furthers a human purpose. However, it does not seem to have been 'designed' in the sense that we use the term in manufacturing or the design profession; it seems to have grown up as part of the practice of non violent direct action. To this extent it can be thought of as 'indigenous' because it is a design that belongs to and has grown out of the groups that use it.

Design theory can provide some insights into the way the lock-on design has come about. It has some things in common with what Christopher Alexander (1964) calls a 'traditional' as opposed to a 'modern' design process, in which objects change and develop through small improvements that progressively make them a better fit with the 'problem field' that brings them into existence. In this case, the problem field consists of finding a configuration for the lock-on that will be easy to put on, will be easy to get off should the need arise, will baffle the police as to its construction for as long as possible, will be difficult and time-consuming to break into, will be portable and will be cheap. Finally, and in this characteristic the lock-on conforms quite closely to Alexander's 'traditional' type of design, its configuration needs to be able to respond over time to the setting in which it is used. Because the lock-on only comes fully into existence when it is used, this aspect of the process of its 'design' involves modifications not only to its inanimate components but also its human ones. Participants in an action design the use of the lock-on by considering how many should lock together, where they should do so, how they will use diversions and the element of surprise. A lock-on is anything but an inanimate object – it is part of a process of use, which is in turn part of a wider practice. Because of this, the lock-on has come to exist through a process and is therefore also not 'modern' in another sense that Alexander's analysis proposes in that it is not individualistic but is a configuration that has grown out of various types of collective practice - political activism.[1]

Having identified a relationship between the lock-on and design theory (Alexander 1966), the discussion that follows considers what sort of 'thing' a lock-on might be and what frameworks exist that might help to understand it. It refers to a further theoretical strand in Design to consider the 'performative' nature of the lock-on (Pine and Gilmour 1999) and to determine whether the lock on can be said to have evolved (Langrish 2004). The discussion then considers whether work in Archaeology may help to understand the relationship between the lock-on and its 'designers', identifying approaches that seek to understand artefacts as part of specific cultural practices (Conkey 1990). The discussion then focuses on work in Sociology that takes cultural practices to be the

[1] Although Alexander offers a stereotype of the modern designer as someone who works alone, contemporary design processes do not necessarily conform to this individualistic pattern. However some of the characteristics of Alexander's 'modern' design process are found in the commercial production of contemporary artefacts. These are often individualised through a brand, and sometimes through the identity of a named designer, for all that there are now conventionally many players in any process of new product development including teams of designers.

'site of the social' (Reckwitz 2002) and which acknowledge the significance of object in such practices (Kopytoff 1986, Shove 1995 & 2005). This discussion intends to point up principles which may be applied to designs that work as part of other practices and which might facilitate changes in those practices and to identify further work on the lock-on, and other similar artefacts that might clarify these principles.

Ways of understanding the lock-on as a design

First it is appropriate to identify the processes and agents through which this object has changed by briefly considering how the lock-on has come to its present form in the practice of non violent direct action. A complete understanding of the development of lock-on devices since the early C20 would require detailed ethnographic and historical work which is beyond the scope of this paper. Also, given the close relationship between the specific design of a lock-on device and the time and place it is to be used, such an enquiry might not uncover a progressive 'development' of the form. However, we can get some useful insights into how lock-ons work by noting their variety and their relationship to the groups of people that produce them.

Central to these insights is the fact that a lock-on does not exist as a discrete object but is a manifestation of the process of non violent direct action, a 'locking-on' rather than a 'lock-on'. It is a verb rather than a noun. This observation could imply a relationship to the recent business theories that emphasise dematerialised services, sold as 'experiences' (Pine and Gilmour 1999). However, the fact that the lock-on is not provided in the usual commercial sense means it a different case from those personalised experiences which are apparently the basis of contemporary service-based economies.

To the extent that it is an object, a lock-on device has more in common with things we might make ourselves to wear than objects with which we have a more distanced physical relationship and which we buy already made. Like clothes, the ways in which lock-ons are worn, their design in use, seem to have both practical and symbolic aspects. These two aspects can also coexist in the way that a lock-on device is made to look, as one of the keys to a successful locking-on is to deceive the police into ignoring the lock-on device until it is too late for them to stop it being used. One tactic is to disguise the lock-on tubes as something else as in Figure 2. At its most creative, such disguise can involve transforming an apparently innocent object into a lock-on – wheelchairs and Zimmer frames are useful for this (Rundberg, 2006: 4).

Other aspects of the appearance of lock-on devices are more conventionally symbolic, such as painting the tubes with the checker pattern that is part of our collective image of a nuclear missile, or a policeman's hat, as in Figure 3.[2]



Figure 2. Lock-on disguised as a CND symbol (Peace News 2006)



Figure 3. Lock-ons with chequer board pattern (Faslane 365, 2006)

[2] Although lock-ons do have symbolic content, the fact that its purpose is to confuse the opposition, rather than to maximise their ease of their use puts them in a particular relationship to the application of theories of language to design found, for instance, in the writing of Klaus Krippendorff (2005). The exact nature of this relationship warrants further research, particularly the way in which their symbolic content is subversive not normative.

The idea that these lock-on devices have developed in some sense over time is attractive even if it may only be possible in principle to clearly understand quite short periods in their development. Langrish's review of the principles of biological evolution identifies which of them might be applied to design and helps to work out the extent to which evolutionary ideas may be applied to the practice of locking-on and lock-on devices. Langrish rejects Lamarckian evolution, the inheritance of acquired characteristics, as an explanation for changes in designs on the basis that this explanation constructs design as a process of striving for success in a future that can't be known. He uses the unintended consequences of designs as the basis for his transfer of Darwinian selection to the world of artefacts – it is the unintended consequences of today's designs that give us ideas for tomorrow's designs. As he stresses, it is not designed objects that evolve – like any organism, a particular design has to live out its life with the specification it was 'born' with, more or less. To the extent that designs can be said to evolve, this process takes place at a level that is equivalent to the genetic code that defines organisms. A particular object may be modified, but this does not usually constitute a revision to its design. Borrowing from Dawkins, Langrish identifies designs as equivalent to 'memes' – culturally reproduced codes. This offers a new-Darwinian view of design change as 'natural selection plus memes, their competition, their modes of transfer, and their transformation' (Langrish 2004: 12).

Langrish suggests that there are three types of design memes, 'selectemes' that are ideas about what to make, 'explanemes' that are ideas about why these are the right things to make and 'recipemes' that are ideas about how to make things. The lock-on as a process/ object involves all these types of ideas and they are mutually inter-dependent, indeed it may be rather difficult to distinguish between these types of idea in the whole phenomenon of locking-on as part of non violent direct action. Ideas about 'what to make', or selectemes, interact deeply with ideas about how to make things, or recipemes, in the context of particular actions. Indeed, given the nature of the lock on as an entity that only exists once enacted it is not clear whether 'what to make' in this case indicates a thing or a political intervention. Also the scale of this 'making' is not easy to pin down, since it can be taken to indicate both making a specific arrangement of materials outside a particular nuclear site as well as making an increase in consciousness at a national, or international, level. The same 'explaneme' is likely to be invoked by a protester talking to a policemen who tries to separate them from some piece of hardware they have locked on to as is used in public debate – that nuclear weapons are illegal under international law.

Clearly, memes about designs exist in both professional design and in non professional contexts that produce designs such as non violent direct action. So to observe that lock-ons have evolved is not to differentiate them in principle from mainstream design. Also, Langrish does not restrict 'idea' in this case to mean what an individual can work with, which allows ideas to be distributed in documents, representations and objects as it is not possible for an individual to hold all the details of even a simple design in their head. Just like a conventional design, the 'idea' of a lock-on is transmitted through formal means such as training workshops as well as through text (Faslane365, 2006, and see figure 4.). However, Michael Polanyi (1966) argued that a good proportion of the knowledge we operate with as designers and in everyday life is 'tacit', and is enacted in our embodied relationship with the world. In this case of the lock-on this tacit, embodied, knowledge is diffused among the groups of activists who employ it as a tactic for direct action and is enacted most powerfully through participating in actions.

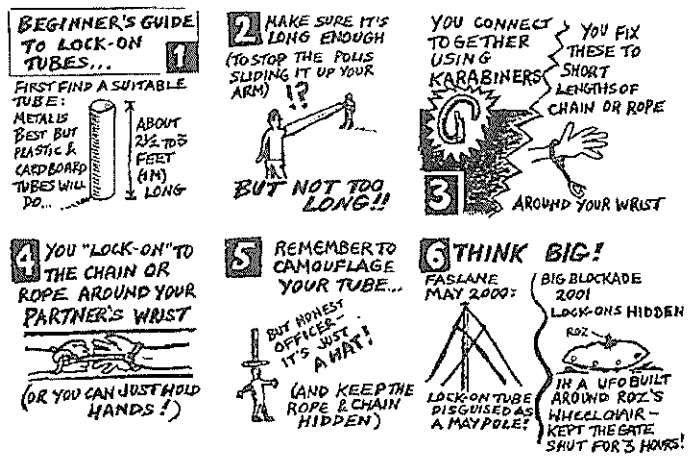


Figure 4. Lock on training material

These facts indicate that the *designing* of the lock on device has taken place within the processes of *doing* non violent direct actions, in their planning and execution and *their* evolution. Just as a design once produced can be modified only up to a point before it must be re-designed, a locking on action that is planned - designed - and then enacted can only be modified up to a point in the face of the police tactics that the participants find confronting them. Although peace activists prepare for and plan actions meticulously, they are necessarily working with an unknown future, as Langrish observes is the case in conventional designing. They cannot be sure their plan will be feasible or predict the reaction of the security forces to their action. Some modification of a plan is possible on the day, but the collective nature of non violent protest means that what is learned from a particular action can be effectively shared and fed into the design of future actions, and future lock ons.

This sharing of experience will affect the details of future actions, but it takes place against a background of collective knowledge and values that probably change more slowly. Because the relationship of the lock on to these other factors that make up the phenomenon of peace activism is based on a tacit understanding of how peace activism works, it may have some similarity to other forms of shared behaviour that have both material and cultural aspects. The tactic of locking on, and the knowledge that exists about why and how to do it, and what devices are good for it, are part of the cultural, material and embodied practice of non violent direct action. They are among the characteristics of what Bourdieu (1984) calls the habitus of the people who make up this group. To some extent these aspects of non violent direct action go without saying for peace activists. The lock-on is an enacted *principle* which is available to individuals by virtue of their belonging to the group. They become skilled in its use by absorbing the mores and values of the group as well as through explicit learning.

'Social Practice' as a theoretical approach to the lock on.

This close relationship between the process of locking-on and the way that non violent direct action works as a group phenomenon seems to be fundamental to the character of the lock-on as an artefact. This is what makes it somewhat unfamiliar, different in both its form and the process of its development from the type of object that designers, design theorists and design academics are usually concerned with.

Although other objects, such as spectacles and automobiles, function as lock-ons do only with the addition of a human body, artefacts like these also have a discrete character separate from the human bodies that 'activate' them. Part of the value of spectacles and cars depends on their symbolic 'content' – they are more or less fashionable for example and are so whether or not they are being worn or being driven. This seems not to be the case with lock-ons, since they fully exist only for the action for which they have been designed and in combination with the activists' bodies.

This fact alone may not constitute a significant difference between the lock-on and more conventional artefacts – indeed it is possible to think of other artefacts whose form develops as part of a collective enterprise. It is now conventional for new product development to at least take account of the characteristics of the intended market for a product, if not to base the development process on the emergent characteristics of that market captured by research techniques borrowed from anthropology (see Holbrook 1996, Waymire and Hall 1995: 41). In a parallel development, theoretical approaches to the design of computer technology have taken a 'turn to practice' which acknowledges the situated nature of experiences with technology (McCarthy and Wright 2004). However, the 'indigenous' nature of the lock-on and the fundamental interweaving of the development of the device and the nature of the groups that have developed it make it different from even such apparently market/ user orientated commercial products, though whether this makes the process of its origination fundamentally different from conventional artefacts is at this point an open question.

Archaeologists have been aware of the intimate relationship between designs and the cultures that give rise to them, especially so since they began questioning what Conkey calls the 'culture history' approach to understanding artefacts. Whereas hitherto archaeologists had acted as if objects could 'stand in' for a culture, from the 1960s they aspired to unpick the multi-determined nature of artefacts and their complex mutually determining relationship to their setting. As Conkey puts it:

Design is much more than that which is applied to a pot; it is the most essential set of processes that bring form into existence. All artifacts and all cultural production are the result of a series of - or a 'pathway' through - mental and manual processes set in and defined by a historical and social framework (Conkey 1990: 13).

It is notable for this discussion that her perspective starts from the premise that 'design' means what identifies a type of artefact and allows it to be positioned in a typology by virtue of its formal relationship to the design of other artefacts, rather than meaning a professional, commercial process that results in artefacts, though it allows for both meanings. She acknowledges that it is practices – what groups of people do – that result in objects with particular form and refers to the notion of 'praxis' found in Marx and Bourdieu. She suggests that we can only understand objects if we think of them 'as praxis, as productions, as symbolic acts in their own right'. This thought is echoed in more recent work on consumption in sociology and anthropology, for example Miller's counterpoising of a theoretical/ semiotic approach to the analysis of consumption with an empirical/ ethnographic approach (1995, 1997). Seen in this way, production for Conkey is a 'constitutive endeavour'. The production of the lock-on is part of a collective endeavour that shifts and changes through time and space and constitutes the practice of non violent direct action as well as being constituted by it.

Considered in this way, the somewhat unfamiliar, perhaps bizarre, character of the lock-on may help to shed light on the way that more 'mainstream' artefacts come into being and how they might change to further aims besides the creation of profit. If the fact that the lock-on changes as a consequence of changes in the practice of peace activism is accepted as a principle for artefact change more generally and in more 'mainstream' settings, then changes to other types of object are likely to rely on changes to practices. This point has not been lost on those interested in working out how to modify practices that are arguably unsustainable in environmental terms. Sociologist Elizabeth Shove, for instance, has studied the way that everyday practices such as laundry, bathing and the heating and cooling of houses have grown up and the elements that keep them in existence in their current form in the developed world (2005).

Drawing from sociological and anthropological studies of technology Shove inspects the premise that societies and technologies 'co-evolve' – citing Kopytoff's assertion that societies 'simultaneously and in the same way construct objects as they construct people' (Kopytoff 1986: 90). She suggests that there are three dimensions to the co-evolution of people and technologies made up of relationships between 'sociotechnical systems' that are 'collective conventions and arrangements', the 'habits, practices and expectations of users and consumers' and the 'symbolic and material qualities of sociotechnical devices/ objects' (Shove 1995: 48). This allows her to consider the material and the symbolic aspects of technologies as well as the ways in which they 'stabilise' as large scale structures and are appropriated at a local level. So in her analysis of bathing she is able to make a relationship between the domestic technical arrangements we live with every day, the infrastructure that provides us with the means to make these arrangements work and, crucially, the very powerful sets of ideas that motivate us to clean ourselves in the particular ways that we do. What is notable in her account is the coherence with which she integrates these elements of bathing and traces the ways in which they change over time.

Shove's account has in this respect a good deal in common with the much more abstract body of theory that can be found in contemporary sociology that engages with 'social practices'. Andreas Reckwitz writes an overview of this 'practice theory' in sociology (Reckwitz 2002). He suggests that this way of thinking about the social offers an alternative view of human actions to that offered by other strands of thought. In his view, culture is the 'site of the social' and distinguishes practice theory from theories of culture that emphasise mind, discourse and interaction (2002: 241).

Reckwitz sums up a 'practice' as;

> A routinised type of behaviour which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge (Reckwitz 2002: 251).

It is characteristic of practices that these elements are interconnected and 'carried' by individuals, in whom many

different practices intersect. They are sustained, not by norms or rational choices, but by routines - habits as it were – which are *embodied* routines that draw on 'knowledge' that can be either explicit or based in emotion. They change through 'ruptures' in the routines that sustain them.

Despite its theoretical abstraction, Reckwitz' account of practice theory points towards some quite down to earth aspects of humans' relationships to the material world. In a parallel to the principle that mind and body can't be distinguished in a practice, in this view human interactions with particular physical things are built into the meaning of practices. Echoing writers in the sociology of technology tradition such as Latour (1992, 2000), Reckwitz proposes that things 'mould' activities. Things '...enable and limit certain bodily and mental activities, certain knowledge and understanding as elements of practices' (2002: 253). In contrast to views of human object relationships that stress their discursive and symbolic content, in this view the materiality of objects, how they 'handle', constitutes the 'forms of behaviour' of which they are part.

Practices depend on knowledge and motivations – we have to know what to do and we have to want to do it. This knowledge includes but surpasses explicit 'knowing that' and includes 'aesthetic' knowledge, feeling, emotion. Knowledge held in our feelings lets us know what to do in a situation or with a thing. Knowledge in a practice '...embraces ways of understanding, knowing how, ways of wanting and of feeling that are linked to each other within practice (Reckwitz 2002: 253). 'This compound of different forms of knowledge includes an understanding of the values that may motivate the practice as well as how to act in accordance with them that is made evident through feelings, a certain 'emotionality'. Emotions are therefore practice-specific; they define, and reproduce the practice.

The lock on as a thing in the practice of non violent direct action – any lessons for conventional designing?

The development of lock-on devices and of the ways they are used in non violent direct action set out above seems to fit rather well with the features of social practices that Reckwitz identifies. It is reasonable to class non violent direct action in peace activism as a 'practice' in this sense[3]; it is collective; it operates according to shared routines; it involves specific (disobedient) bodily activities; it is motivated by knowledge of the illegality of 'our' weapons of mass destruction; this knowledge is felt as a passionate desire for action; it is based on an understanding that collective political protest can effect change. Most relevant for this discussion however, non violent direct action involves the development and use of particular 'things' – for locking on.

The lock-on in non violent direct action is a perfect example of a 'thing' that is part of a practice. The physical transgression of accepted behaviour that locking on requires draws on a tradition of dissent that has deep roots in British political and cultural life; it is part of a long established practice of dissent. Locking on is very obviously *embodied* and the way the lock-on device 'handles' both in its materiality and in the discourse of power and resistance that it 'speaks' is crucial to the practice itself. The routines of non violent direct action change in response to 'ruptures' provided by the security forces that result in changes to many elements of the practice – changes to the lock-on devices themselves being only the most visible of these. The tactics in which lock-ons are employed change in response to modifications in the knowledge that is brought to the practice.

The lock-on device could be almost too perfect an example of an artefact that is part of a cultural practice. It would be possible to dismiss practice theory as a useful starting point for thinking about designs on the grounds that while the lock-on fits the theory very closely it only does so because it is a pathological rather than normative design in social terms. Such a criticism might point to the usefulness of an approach

[3] One feature of practice theory that is not immediately clear is the grounds for naming a particular activity as a practice, rather than its components, or activities of which it is a part. It seems reasonable to assume that sociologists would base this classification on the activity having social significance – being a genuine 'site of the social'. However it is not clear how this criterion should be used empirically. Given that different interests are at stake in Design than in Sociology it is also reasonable to assume that different classification criteria for practices might validly be used in the two disciplines.

to designs that stresses their symbolic character, appealing to the well developed body of theory that stresses the symbolic aspect of our relationship to artefacts in consumption (Baudrillard 1993) and design (Krippendorff 2005).[4]

Such a criticism might derive from a political judgement that rests on a view of the proper 'ends' for designing and as suggested at the beginning of this paper different political positions will result in different evaluations of this discussion. It might also relate to the question of the appropriate definition of 'design theory, since, if Alexander's definition of 'modern' design is the only one considered acceptable it would be possible to argue that the lock-on has not properly been designed at all. If the only proper ends for designing are the creation of profit, then yes, the pathological character of the lock-on makes it an unfit model. If design is understood to be an activity circumscribed by its professional definition then the lock-on is similarly unfit.

However, it is possible to see in Shove's analysis of practices on the level of interlocking social, cultural and material systems an urgent purpose for alternative ways of understanding designs and designing, similar to those adopted in the 'participative' design tradition (Ehn and Kyng 1991), but with the more radical purpose of exploring the potential to use this understanding to modify practices in the service of, for instance, environmental sustainability. The 'practice oriented' approach outlined above in relation to the lock-on has the potential to provide sufficient understanding of these systems to allow them to be changed by policy, and by practice oriented designing. Understanding material things requires understanding practices. Given that practices and things are mutually constitutive, changing things might accompany changing practices.

The discussion above implies further work that would make it possible to more confidently specify the insights the lock-on, and other indigenous designs, can provide. A more complete historical/ ethnographic study of the way the design has come about, and how it changes, would be a very significant element in this work. This would make it possible, for instance, to ascertain whether the group organisation involved in non-violent direct action and the development of lock-ons was equivalent to, or significantly different from, the organisation of the participative and community based design traditions that appear to be its closest relations. With an opposite disciplinary orientation, such a study would also make it possible to determine the significance of the lock-on for sociological theories of human/ object relationships.

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[4] Archaeology provides other ways of conceiving of the meaning of objects, for instance Schiffer's (1999) account of the communicative potential of artefacts.

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KILLER PRODUCTS IN THE MARKET ECOSYSTEM, THE ROLE OF DESIGN IN KILLER PRODUCTS

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Abstract:

There is an obvious analogy between market space and ecosystem. In this analogy, products might be regarded as species, market success as natural selection, etc. The market space has its "invisible hand" as natural forces beyond control of humanity, and we watch it in awe just as we watch (and try to predict) the evolutionary processes. In fact, we are not helpless in this regard, and design is our best tool to intervene the market forces.

From this fertile analogy this paper proposes to examine killer products, making comparison with "killer weed" (Caulerpa Taxifolia) in the Mediterranean; a type of algae, generally used as aquarium ornamentation, accidentally released to the Mediterranean Sea. This seaweed prevents other plants from growing leading to the nickname "Killer Algae".

Their "success", might be harmful to the ecosystem as a whole.

In this paper several killer products and technologies (including iPod, IBM PC, digital cameras and some others) are investigated. Whether killer species-products are unpredictable and uncontrollable are questioned. In short, the paper tries to summarize what makes a product "killer" and the role of design in this process.

Introduction

For those having a chance to gaze around the Caddebostan coast of İstanbul, (the Sea of Marmara, Turkey) there is only one type of algae that can be noticed. It is Caulerpa Taxifolia, frequently referred to as "killer weed", which covers so dense a space in the sea floor that it prevents other sea plants from growing. At first, it was an aquarium ornament. But it was accidentally released from Monaco in 19B4, to the Mediterranean, becoming so pervasive in this area that it got the nickname "killer algae". As a designer, dwelling in Caddebostan neighbourhood, I am inspired from this killer weed and motivated to think about whether products are similar to it. Killer products in the market eco-system might be a good, new investigation subject in design area.

This paper aims to understand the role of design in creating a killer product and what makes a product "killer". This is achieved by comparing killer weed (Caulerpa Taxifolia) with killer products (iPod, IBM PC, QWERTY keyboard, Viagra etc.) considering the new market economy and its dynamics. Most appropriate similarities are chosen to provide a starting point for determining role of design in creating killer products.

The current trend of the market evolution is from "traditional" to what we call "new economy". In the old "traditional" economy, competition takes place primarily through price or output on the margin and through incremental innovation. In contrast, in the new economy, industries experience rapid technological change; competition, radical innovation or creative destruction through investment in research and development and on intellectual property (Stanborg, 2002). Killer products are established by "market-destroying innovations" (Evans and Schmalensee, 2002). A key term, *creative destruction*, introduced by the economist Joseph Schumpeter, describes the process of industrial renovation which goes along with radical innovation leading to sustained long-term economic growth (1942).

Increasing competitiveness in the market, winning by design, explosive growth, and dominating the market become significant issues for the business. The demand is for products that have high market share, are competitive, smart and satisfy the user while making the purchase decision more certain. In other words, the industry is well positioned to create killer products to disorder the market

As Evans and Schmalensee mention:

> ...firms engage in dynamic competition for the market – usually through research and development (R&D) to develop the 'killer' product, service, or feature that will confer market leadership and thus diminish or eliminate actual or potential rivals. Static price/output competition on the margin in the market is less important (2002:1).

The economic importance of sparking ideas for "killer products" that will positively impact the company's success and growth is clear, but the characteristics of killer products or which of these characteristics are critical for the design process are less widely discussed.

This paper forms analogies between killer algae that disorder the seafloor, and killer products that disorder the market to examine killer products. Certainly, every analogy has its limitations and weaknesses but it is still worthwhile to consider the resemblances.

The contents of this paper are as follows: firstly, a definition of "killer product" is attempted. Second, similarities of the killer weed *(Caulerpa Taxifolia)* are analyzed. Following this, design elements behind killer products are identified. Finally the user relationship, in terms of culture and human interaction are considered, and the paper concludes by identifying implications for future research within this field.

1. WHAT IS A KILLER PRODUCT?

Firstly, a definition of "killer" is "An impressive, formidable, or excellent person or thing; one who kills". It is described as "Very effective; excellent, sensational" (Oxford English Dictionary). Secondly, the weed is a plant, frequently wild and unwanted. A critical aspect about killer weed is that human actions can turn a plant to a weed by transferring to a habitat where no natural grazing predators are living; and they will compete with other plants for resources. Following these descriptions, a definition for killer product might be formed. A **killer product** is so desirable or successful that it covers a very large space in a particular market. Since it disorders the market, rivals gradually disappear because not enough free space remains in the market. These products are generally smart, technologically innovative and easily mass produced in large numbers. They are not always icons of design but might have the potential to be turned into a design icon.

1.1 Killer application

Secondly, regarding software industry; killer application (killer app.) might be defined. "An application which is particularly significant or useful; a feature, function, or application of a new technology" that intentionally or unintentionally compels the consumer to make the decision to buy the system the application runs on. "It is presented as virtually indispensable or much superior to rival products; also in extended use" (Oxford English Dictionary). Clearly killer application is a specific form of killer product.

According to Downes and Mui, "Killer applications will redefine the entire manufacturing-distribution-retail-finance business cycle, creating gigantic new markets while it undermines existing ones" (2003: Chapter 1.3). The impacts of killer applications are **indirect** and **unpredictable**. And their second order effects, which are far reaching and unintended, are more significant than first order effects. (Downes and Mui, 2003).

> IBM never would have believed that its own marketing of a personal computer, with software and hardware from tiny partners Microsoft and Intel, would devastate their mainframe-centered business model and shatter their computer industry dominance in only a few years (Downes, L., Mui, C., 2003. Chapter 1.3).

However, a killer product may not always be digital. An example from medieval times is the stirrup; a medieval weapon which helped Franks forces at war.

Charles Martel, leader of the Franks, understood from his victory that the stirrup hadn't simply improved the effectiveness of his forces, as a new weapon or fighting formation might have done. Rather, it changed his entire military strategy. Stirrups made possible a mounted cavalry, a new element in the battle equation, and Charles Martel immediately made them a permanent feature (Downes, L., Mui, C., 2003. Chapter 1.3).

1.2 What is killer? Product, technology, brand

It is a good question to consider whether the killer is the technology or the product or else the brand. Bonaccorsi speaks about radical products: "Significant role is played by technological evolution, but the interplay between the understanding of customer needs and the opportunities offered by technology is not subject to a thorough analysis." (2006:2). It is feasible to look at the subject with respect to different layers like killer brand, killer technology or killer product. Some intersections are obvious. Examples to possible combinations; a killer brand produces killer product with introducing killer technology. Nevertheless, a company may not be the pioneer of the killer technology or have the drastic innovation but still have the killer product.

1.3 Types of killer products; revolutionary vs. persistent

In support of killer products, an abstraction is promising regarding modes of evolution. On the one hand, there are killer products that we were using in the past, using now and probably will use in the future. These products resist to evolution. They hardly change in time even if they have some troubles in terms of design and usage. They are **persistent** killer products. QWERTY lay-out keyboard, jewel box CD case are in this group. On the other hand, there are killer products that are opening new categories. They become pervasive with respect to a technology or functionality or a user group they introduced. They are forcing evolution in other words they are **revolutionary** killer products. They are more temporary, short-lived, lose their impact in time. Ford Model T, IBM PC and Sony Walkman are not killer anymore, although they left something to the knowledge of technology, human interactions, and culture. Revolutionary killer products are short-lived because they mainly depend on available new technology. Technological improvements, changes significantly affect the product life cycle.

There are also some killer products neither revolutionary nor persistent. It is also possible that some revolutionary products are also persistent.

1.4 Killer products create new categories

One significant feature of killer products is that they open new categories in the market therefore owners of these products become early leaders.

Bonaccorsi states:

> Radical product innovation can generate entire new industries, as in the case of the PC, low cost airlines, or mobile communication, but also can sustain the competitive advantage of innovative firms in established industries, as in the case of iPod in the entertainment industry, or Geox in footwear (2006:2).

1.5 Killer products make money

Winners get large market shares and high profits for a while. (Evans, Schmalensee, 2002). Table 1 demonstrates top 20 companies ranked by market value in billions of dollars as of December 31, 1970, 1985, and 2000. Regarding this table, it is potential to draw some conclusion representing killer product's success. For instance, having the 1980's killer product, PC, IBM became market leader. However PC lost its killer effect and rivals adapt the technology following IBM lost its position in 2000. Moreover, Cellular Phone technology leads Nokia Corporation, one of the world's best-known brands, to high level of market value. Moreover, at present, every third mobile phone sold in the world is a Nokia (Kuikkaniemi, 2004). In other words it is possible to state that firms that have killer products, have great market value.

	1970		1985	
Rank	Company	Market value	Company	Market value
1	IBM Corp.	$36.4	IBM Corp.	$95.7
2	AT&T Corp.	$26.8	Exxon Corp.	$40.3
3	General Motors Corp.	$23.0	General Electric Co.	$33.2
4	Exxon Corp.	$16.4	AT&T Corp.	$26.7
5	Eastman Kodak Co.	$12.2	General Motors Corp.	$22.3
6	Sears Roebuck & Co.	$11.8	Royal Dutch Pet.	$16.9
7	Texaco Inc.	$9.5	British Telecom	$16.8
8	General Electric Co.	$8.5	Du Pont de Nemours	$16.3
9	Xerox Corp.	$6.8	Toyota Motor Corp.	$16.2
10	Gulf Corp.	$6.7	Amoco Corp.	$16.0
11	Du Pont de Nemours	$6.3	Bellsouth Corp.	$15.0
12	Ford Motor Co.	$6.1	Sears Roebuck & Co.	$14.2
13	Royal Dutch Pet.	$6.0	Chevron Corp.	$13.0
14	Mobil Corp.	$5.8	Mobil Corp	$12.4
15	Minnesota Mining & Mfg Co.	$5.6	American Express	$11.8
16	Avon Products	$5.1	Procter & Gamble Co.	$11.7
17	Coca-Cola Co.	$5.0	Standard Oil Co.	$11.7
18	Procter & Gamble Co.	$4.7	Matsushita Electric	$11.5
19	Chevron Corp.	$4.6	Atlantic Richfield Co.	$11.5
20	ITT Industries	$3.6	Eastman Kodak Co.	$11.4

	2000	
Rank	Company	Market value
1	General Electric Co.	$475.0
2	Exxon Mobil Corp.	$302.2
3	Pfizer Inc.	$290.2
4	Cisco Systems Inc.	$275.0
5	Citigroup Inc.	$256.4
6	Wal-Mart Stores	$237.3
7	Microsoft Corp.	$230.6
8	American International Group	$228.2
9	Vodafone Group	$219.7
10	Merck & Co.	$215.1
11	Nokia Corp.	$202.4
12	Intel Corp.	$202.3
13	GlaxoSmithKline	$201.9
14	Oracle Corp.	$162.2
15	SBC Communications Inc.	$161.6
16	BP Amoco.	$155.5
17	Coca-Cola Co.	$151.1
18	IBM Corp.	$150.8
19	Johnson & Johnson	$146.1
20	EMC Corp.	$145.5

Table 1. Top 20 Companies ranked by Market Value
Source: FactSet Research Systems inc 2001 Fact set collects financial datas from the 10-Qof the firms with out standing securities publicly on all U.S. Markets)

2. SIMILARITIES OF KILLER PRODUCTS AND THE KILLER WEED

The concept of the killer product as itself is difficult to define, offering a method to explain killer products is also a difficult task. On the other hand the market place and ecosystem have common characteristics. The examination of killer products in detail by building an analogy between the killer weed; *Caulerpo Toxifolio* and killer products is promising. Although *Caulerpo Toxifolio* is a weed that is certainly unwanted, harmful to the ecosystem entirely, killer products are often desirable, and their effects are reasonably complex. However the parallel between them are considerably appealing and informative. Mainly, identifying these basic features constitutes a starting point for determining role of design in creating killer products.

2.1 Accidentalness

> Caulerpa Taxifolia, commonly used for aquarium ornamentation, was **accidentally** released to coastal waters of Mediterranean where it turns to killer algae (Meinesz et al, 1993).

Drivers of innovation are sometimes matter of luck and accidents (Geroski, 2004). Changing the environment of a product, its habitat might turn it to an amazingly successful product. Pfizer produced Viagra originally a medicine for heart conditions. Accidentally discovered side effects make it a widely known treatment for male sexual dysfunction. Nevertheless, it is essential to understand the reasons behind this accident: what similarities and differences between environments or intended users that produce something differently. "Post it" notes, Aspartame are also examples of accidentally developed successful products (Geroski, 2004).

2.2 Pervasiveness

*Coulerpa taxifolia is **pervasive**. It is the fastest-growing seaweed in the world and covers the sea bed like a thick blanket. It is capoble of extremely rapid growth; up to 1 cm per day*

Killer products are easily mass produced in large numbers. Moreover distribution channels are powerful, and their growth appears to "snowball". Internet; world-wide network, Microsoft products are used to control virtually all of the world's PCs and laptop computers (albeit smaller shares of mobile phones, hand-held and server computers). Wintel computers, Windows working with Intel computers are ubiquitous. We can describe killer products pervasiveness with positive feedback and network effect.

2.2.1 Positive feedback and network system effect

Positive feedback is a system response sometimes called as snowball effect; reinforce a process, affects even more in the same direction. For instance products attract users, which lead

to an increase in perceived product value, which in turn leads to more users being attracted to the product. One common example of positive feedback is the network effect. Network effect is:

> The phenomenon whereby a service becomes more valuable as more people use it, thereby encouraging ever-increasing numbers of adopters (http://www.marketingterms.com/dictionary/network_effect/).

Where the more people are encouraged to be a part of a system or have the product, the association becomes larger. The result is that the network grows more and more quickly over time that leads to produce higher distortion.

Robert Metcalfe, formulated a law related for network effect, states that the value of a telecommunications network is proportional to the square of the number of users of the system (n^2). First formulated by in regard to Ethernet, Metcalfe's law explains various network effects of communication technologies and networks such as the Internet and World Wide Web.

The example of fax machines is used to illustrate the Metcalfe's law (Figure 1). A single fax machine is useless. However, the potential usefulness of every fax machine increases with the sum of fax machines in the network as the number of people associated with each other as each user may send and receive documents increase.

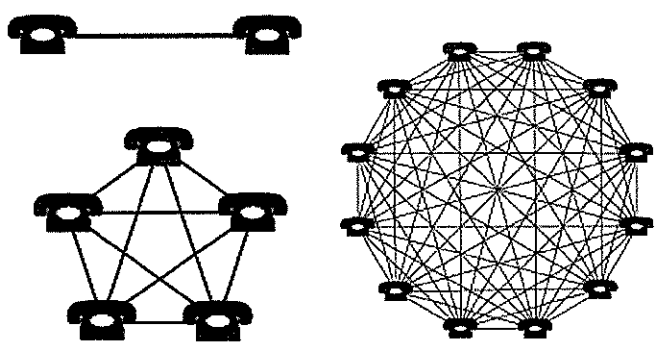


Figure 1: Coetzee, D. (2006)

In all cases the use of common standards plays a critical role in linking network users (Stanborg, 2002:3). In addition, users might easily exchange data, (Word documents, spread sheets) sell the output more easily when there is a common standard. Moreover, design education in schools is affected by this positive feedback. School computers are donated by particular software programmes, as an answer to professional work expectations. Students are educated with these dominant software programmes making them more widespread after they graduate.

Network effect helps to reinforce the leadership position of firms. Software developers tend design programmes for killer brands like software to sell their outputs more easily. Therefore, making it difficult for small firms to survive unless the significant product innovation.

2.3 Invasiveness, suffocating

Caulerpa Taxifolia is invasive, competes for space. First it disorders, then replaces and dominates the flora (Meinesz et al., 1993). Ecologists are worried because the killer weed is choking off food that sustains fish and sea birds, ***forcing*** *many species* ***to leave*** *their home grounds and forage elsewhere (Madl and Yip, 2005).*

2.3.1 Types of innovation

One of the significant features of a killer product is the level of innovation it covers. Innovation is often characterized by its impact on existing markets or businesses. There are two types of innovation: incremental innovation or radical innovation. Incremental innovation a modest type innovation, offers improvement, but a follower innovation of a radical innovation. **Radical innovation** invades a particular market, replacing the older technologies. Killer innovation might be called as radical innovation "disruptive innovation" (Christensen, 2003) or breakthrough innovation".

2.3.2 Disruptive technology

Disruptive technology, was introduced by Harvard Business School professor Clayton Christensen, *The Innovator's Dilemma,* 1997, is defined as: "A new product or service that disrupts an industry and eventually wins most of the market share" (http://www.wordspy.com/words/disruptivetechnology.asp). Companies aimed to resize market share with having disruptive technology. Disruptive innovation often marginalized

or displaced older technology. For instance, Disruptive digital photographing technology is pervasive. It is in the form of digital camera or integrated to the mobile phones. Furthermore, it is easy to use, convenient, simple, cheaper, and quicker. Photographers substitute film-based cameras for digital ones, then chemical photo processing labs go out of business because their services no longer are needed. An example is AgfaPhoto, a chemical film based company, which announced they provide no digital equipment (Harrison, 2001) afterwards they went bankrupt in 2005 (http://www.dpreview.com/news/0510/05102102agfa_end.asp).

2.3.3 Creative Destruction

Killer products are recognized by market-destroying innovations and creative destruction. The economist Schumpeter explains the process of industrial transformation that come with radical innovation. According to his view, innovative entry was the force that sustained long-term economic growth. (Schumpeter, 1942). "Creative destruction occurs when something new kills an old thing. A great example of this is personal computers. The industry, led by Microsoft and Intel, destroyed many mainframe computer companies--but in doing so, entrepreneurs created one of the most important inventions of this century" (http://www.investopedia.com/terms/c/creativedestruction.asp).

Figure 2 (based on Innovators' Dilemma, Christensen, 1997) demonstrates the performance outcome of disruptive technology.

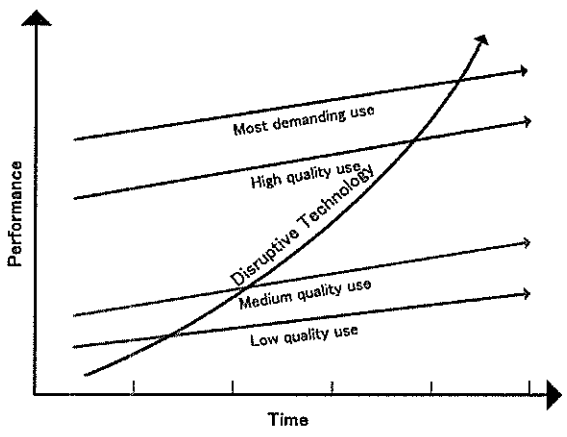


Figure 2: Disruptive technology (1997)

2.4 Particularity

Caulerpa Taxifolia was ***not killer in warm water*** *however it turns into a killer species in colder water like Mediterranean. It has been discovered off the coasts of Australia and the United States, though none of those encroachments are anywhere near the scale of what is happening in the Mediterranean.*

A product is killer in a niche market. "A dominant design needs to be established in a particular market" (Geroski, 2003:127). "The products based on the disruptive technology initially only satisfy a niche market segment, which values dimensions of performance on which the disruptive technology does excel." (Danneels, 2004:247). For example, pervasive mp3 player iPod is very crucial, but only for its target user.

2.5 Dominancy

> Plant and animal diversity and abundance are reduced where Caulerpa Taxifolia has invaded. The aquarium strain of it has been documented to displace native vegetation, particularly sea grass beds, and become the dominant plant life (Madl and Yip, 2005).

"Dominant products are an important part of the story evolution of new markets because they are the result of a process of standardization which drastically reduces product variety" (Geroski, 2003:122). Their success might be harmful to market ecosystem. An explanatory example might be from QWERTY keyboard. The computer keyboard originated from the typewriter. The standard typewriter keyboard (nicknamed QWERTY) was designed over a century ago. The type-bar system and the universal keyboard were the machine's novelty, but the keys jammed easily. To solve the jamming problem, another business associate, James Densmore, suggested splitting up keys for letters commonly used together to slow down typing (http://www.sciencemuseum.org.uk/online/typewriters/page4.asp). This became today's standard "QWERTY" keyboard and now is used for to write fast. "QWERTY has become a controversial issue, because many individuals feel that the sequential keyboard market is being monopolized by a sub-optimum layout" (Noyes, 1983:266).

QWERTY introduces the concept of layout design. On the other hand, now it does not let any lay-out design to grow in the market because it covers everywhere becoming the standard. Today's technological availability, it is meaningful to design a keyboard depending on language; in terms of mostly used letters arranged closely. "F keyboard" is a Turkish keyboard layout designed for efficient typing in Turkish language, a general winner of typing contest (http://www.interstenoturk.com/ihsanyener.html). The keyboard was designed over resolution of which letters combined together, and how often. However; it is hardly find even in Turkey since QWERTY keyboard is so pervasive. There are few F keyboards for desktop computers, but hardly any for laptop computers.

2.6 Aggression

> Caulerpa Taxifolia, a highly invasive weed, produces large amounts of toxins give harms to competitors (Ruesink, Collado-Vide, 2004).

Killer products limit the growth in a system by fixing prices or preventing competitors from distributing their products. Certainly, there has to be antitrust regulations to prevent market domination by a single firm. For example, in 2006 Microsoft released an Mp3 player;"Zune" with such aggression that they advertise it as "new enemy" and "iPod killer" (www.zunescene.com).

Microsoft also does not let new entrants in the market. There exists a big battle in the operating system arena between MS Windows and Linux. Microsoft products are specifically made not to be compatible with Free Software. Moreover, Microsoft cooperates with other software giants to make their software compatible only with MS Windows.

Unlike many other media players, iPod was designed not to play music files from other competing music stores. Napster or MSN Music uses rival DRM technologies like Microsoft's protected WMA or RealNetworks' Helix DRM. Moreover alternative royalty free audio formats, such as Ogg Vorbis and FLAC, are not supported, possibly because they are developed by media standards bodies of which Apple is not a member. No support for particular formats is actually a way of releasing toxins. Furthermore iPod offers a converter for non-DRM WMA files, which is provided with the Windows version of iTunes. This is called displacement.

3. PRODUCT-USER RELATIONSHIP, CULTURAL EFFECTS OF KILLER PRODUCTS

3.1 Redefining human interactions, habits

A killer product has potential to reshape human interactions, habits from bottom to the top. These products have big impact on target users' life. Besides they quickly become necessary for their users. For example "e-mail" was purposely a network of scientists' computers. Now redefines human interactions, communication habits. Cellular phones, PC, television and internet are first coming examples that work nearly the same. A killer product becomes central to its specific user and creates a novel category her/his life similar impact as in the marketplace.

Wright and McCarthy argue that the implementation of technology is rebuilt by designer in terms of experience and culture (2004). For instance; with the introduction of mp3 technology users gained a new ability "Randomness" which is not available before. The 'iPod Shuffle' cleverly integrates this new technology to re-construct user experience. "Life is random" is the design concept of 'iPod Shuffle' which has no LCD display or play list offers options for regular play or random order with shuffle button.

3.2 Becoming indispensable

A killer product offers or seems to offer pleasure, satisfaction and fulfilment to its user. It is presented as virtually indispensable or much superior to rival products; also in extended use. A user, who purposefully or non-purposefully buys the product, appears unable to avoid it later.

A product has to be personalized in order to become **indispensable** to its user. In iPod success, personalization might also be achieved because of its simplicity, "In a society of mass customization, only the simple can become the "my" (Wallace, 2006:20).

Because the killer products become indispensable in our life, users lacking these products are marginalized. Not only many of us

cannot imagine life without some killer products, but also we are having difficulties to understand a person without a killer product. Moreover their unavoidable characteristic such as mobile phones, e-mails assumed as a mandatory in contemporary life. Lacking these facilities and resistance to them such as turning mobile phones off (let alone not having any) or not checking e-mails daily become unusual. Internet and mobile technologies create many opportunities, solve problems; nonetheless, pervasiveness and their dominancy dictating human interactions and attacking individuality as being constantly "on call" both at work and in free time. Expectations from human pace increase with increase in speed that is technologically available.

In short, in 90s it was no home without TV, in 2000s; no home without internet, now; none without mobile phones, and no young without portable music player.

3.3 Cultural fabric of society

In our commercialized and entertainment oriented society, catching people's attention to/with pleasurable objects is widespread. Killer products are so pervasive that they become integrated into the cultural fabric of society. Pleasurable objects are movie stars, heroes.

In the following subsections some examples are given about how iPod cleverly and pervasively advertise the product. One can see the pervasiveness of iPod very easily, in daily life, in books and in series etc

3.3.1 Movie; Firewall, kidnapping

In this movie the main character; Father working for a bank is played by Harrison Ford. His family is kidnapped. He needs to transfer money from 1000 thousand accounts to the bad guys' account to save his family. He thinks of using iPod to achieve this task, needs his daughter's iPod. The picture of the related scenes is, father comes to the bed where the mother is looking with big, frightened eyes, and the daughter is sleeping with listening iPod.

The dialogue between father and daughter:

Father: "Honey, I need to borrow your iPod"
Daughter: "Do I get it back?"
Father: "Sure, I promise"

The above dialogue demonstrates the level of importance of the product and intense product attachment. The daughter, who is thinking of her iPod while being kidnapped, is pathetic. In the Following scenes of the movie the father uses iPod to change accounts, saves his family.

3.3.2 Book; Fielding H. (1999) Bridget Jones' Diary. Penguin, London

The Bridget Jones called a person as "Mr iPod". Wright and Blythe state in cultural study of iPod; "The experience of the iPod is made up not just of stories about the songs creation, her (Bridget Jones) own memories and the song itself, but also of her moral and political attitudes to the technology: the experience of the iPod then, is not only social, cultural and aesthetic but also moral and political" (2005:6).

3.3.3 TV serial; Medical Drama House on Fox released 20 September 2005/Tuesday prime

The main character; Dr. House uses his iPod help diagnose a young patient's heart problem. Picture of the serial is "Dr. House and his associates gathered round a table upon which lies his trusty white iPod, hooked up to a speaker. Mr. House touches the click wheel to play the heart sounds he's recorded, and keeps replaying them until one of his associates 'hears' the problem. Then, while they hustle off to deal with the patient, House goes back to listening to classical music." "With the iPod's help, they managed to solve the episode's medical mystery!" (McCunications, 2005).

3.4 Generality, generic products

Because of the powerful impact of killer products on society, they are used as generic terms or renamed the objects. For example, when Wallace states: "Everywhere you look, there is another cleaner, less encumbered user interface. Call it the iPodization of our world" (2006:21). He uses the term "iPodization" for something much broader than the product itself. His description reminds minimalism. Either he perceives minimalism as "iPodization" or at least he uses the name "iPodization" for a movement such as cubism, futurism.

In addition people start to use to iPod as a generic name for mp3 player. The announcement on Australian Airlines plane "Could you please turn off your iPod please?" Rose (2003) calls iPod as "21st-Century Walkman."

The sticky notes that allow removal and reattachment to paper are frequently called "Post-it". "Although Post it" is a registered trademark under the license of 3M, it used as a generic term for any such product. 3M manufactures other products towards the Post-it note concept, leveraging the success of the brand. This ubiquitous originally yellow square spread to the computer software in versions like Stickies or PtiMemo, 3M markets its own software under the name of 'Post-it software note'.

Even though killer products seem to emphasize personalization, user creativity and identity, in turn individuals become predefined typical users being a member of a target user group. Although Wallece introduces "iPodization" to describe simplicity and clean lines, it is possible to redefine "iPodization" as a social and cultural process that iPod build its society. It represents not only a change on how we think about personal audio-entertainment gizmos, but also a change in the way redefining individuality, social interactions with products and technology in our lives.

CONCLUSION

The weed is often an undesirable plant, unwanted and their effects harmful to ecosystem as a whole; however, whether a killer product is a designer's dream or fear is unclear. In a sense, killer products are like beautiful monsters. *Caulerpa Taxifolia* offers a great opportunity to understand killer products, with regard to the parallel between marketplace and ecosystem. Companies are well positioned to eliminate their rivals through discovering killer products produced by radical innovation. Many other firms are trying to predict and act accordingly to the next killer product in the market. However, because of the uncertainties and risks associated with killer products, it is difficult to create, select and introduce such products. There is no pattern to the nature of successive innovations in a particular sector, or in the speed at which they follow each other (Geroski, 2004). In this regard killer products are unpredictable. They create new categories and improve the product quality. Killer products reduce some of the transaction costs (money and time) for buyers and sellers including search costs, information costs and decision costs.

In this paper we have assumed that designer's role in creating a killer product is the interpretation of new technology, its application in the development of new products, and in identifying opportunities for radical innovation, for its particular sector via understanding the user's broader needs and expectations. The process of creating a killer product calls for realizing the product attachment, market dynamics, and technology.

Designing a pervasive product to its passionate user needs crucial design criterions like providing user-centred functionality, integrating insight with advanced technology and implementing the details well. Enriching the experience of fullness in ones mind with forms and functionality is the designer touch to the product.

The impact of killer products might be harmful to the design process. They are dominating the marketplace therefore it becomes difficult to design new products. They limit the product range and variety of design. Besides, they dominate a kind of aesthetic, and the coming products starts to look like killer products (an example of this was when Apple first introduced the i-mac with a brightly-coloured, translucent plastic case - soon lots of other products, not just computers, started to adopt the same aesthetic). Unfortunately, users sometimes unintentionally make inappropriate purchase decision since killer products limit the choices.

Killer products influence human relations, communication habits and expectations. Arguably, their dominant characteristic and pervasiveness have a harmful, suffocating effect on us as individuals (choice, identity, freedom) and on society. It is obvious that killer products largely affect the society therefore my further research will seek for answers to the questions like whether killer products are ethical or moral to design a killer product. How it affects humanity in terms of globalization and personalization. Moreover, further studies might look for the idea of refusing and resisting killer products, and will discuss whether the killer products are actually killer or fad.

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PERIODIZATION IN A RESEARCH ON THE HISTORY OF DESIGN IN TURKEY

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Abstract

This paper first shortly discusses when the concept of "everyday life" entered the field of design historiography and then relates "history of design" to a "periodization proposal" constructed for a research on the history of design in Turkey focusing on the everyday life. The proposal presented here is a narration of author's own experience related to her ongoing PhD research in Art History Programme of ITU Institute of Social Sciences.

Before going into detail, it is necessary to tell that "design" refers to industrial design and "Design History" refers to the literature on the history of industrial design through out this paper.[1]

The Challenge of Periodization in Design History and the "Everyday Life"

Design historians and researchers practice the same basic methodological, theoretical and ontological problems as do any historian (Walker, 1989). Historians from different specific areas have been reflecting on the discipline for a long time. The study of the problems and the way history has been and is written is "Historiography" (Furay and Salevouris, 1988). Therefore, as we study 'historiography', we do not study the events of the past directly, but the changing interpretations of those events in the works of individual historians. Design historians in the 1990s had fiery discussions on design historiography and the discipline itself.[2]

Design Historiography is a field where changes in practice, methodology, philosophical theories and definition of 'design' and of 'history' play a principal role. Therefore "What is design?" and "What is history?" is an issue of the literature of Design History. The introductive parts of most volume in Design History literature usually try to handle the definition problems and the whole writing practice is inevitably constructed according to the accepted definitions of the historians (Özdemir, 2002). So, Design History could be the "history of design theory" and "design research" in paralel to the discussions of the relationship between history and theory. But it won't be wrong to say that Design History up to now, with its exceptions, stayed far from being reflections of design theory and research. This is understandable to some point. The studies labeled as design history and published as commercial books are targeted to a wide group of people from diverse background who are unfamiliar with design theory and research. So, change in the design of industrially produced products in terms of physical appearance and meaning seem to be more appealing than the reflections of the change in design theory and research. On the other hand it is inevitable that these reflections lay somewhere in between lines of those texts for the ones who want to trace them, and who are already familiar with design theory and research.

Development of Design History as an independent field of research is still arguable. In my opinion Design History has been more under the effect of Social History and Material Culture Studies in the past twenty five years. One of the prominent areas of exploration driven from History introducing new sources is the concept of "the everyday life". Everyday life has become an established subject matter of history a few decades

[1] Meta Meta Discourse as J. Walker puts it in his "Design History and the History of Design".
[2] Special Issue of Design Issues on Design History, 1995, Volumue 11, No.1.

before than it did for design history.[3] Retrodiction of historical experiences and ways of the life of the ordinary were of the main distinctions of the triumph of the Annales School. The history of the everyday life became a more important arena following the texts like Lefebvre's "Everyday Life in the Modern World" in 1968, Zimmermann and Pollner's "The Attitude of the Everyday Life" in 1970, Heller's "The Heterogeneity of the Everyday Life" in 1970, Bourdieu's "Class Tastes and Lifestyles: the culture of the necessary" in 1979 and de Certeau's "The Practice of Everyday Life" in 1984. In 1995, Lüdtke acted as the editor of "the History of Everyday Life: Reconstructing Historical Experiences and Ways of Life". While attention of historians were directed to the everyday, the definition of design in design history literature shifted from tactile artefact and visual attributes that rooted in art history perspective into a more profound understanding of design partly following design theory, design research and new paradigms in historiography. "The inclusion of the everyday life in the literature of design history" has its roots both in history and design theory.

What could be expected afterwards may be a set of new methodologies in studying the history of design in the everyday life, new approaches of periodization and classification as well as introduction of new sources. As the subject matter of design history broadened itself intersecting the realm of consumption studies, anthropology and ethnography through the seminal texts in the 1980s new methodologies and sources were introduced. But the periodization approaches stayed somehow static and parallel to the previous approaches. Meanwhile historians from diverse research areas have been criticizing the periodization approaches and terminology they have been using (see Georg G. Iggers, 2004).

Periodization as subdivisions of historical time is a product of the human mind to be able to study the past and to assign to the present its place within the stream of history. It is a general attitude to divide the passage of time into past, present and future. Although certain things about time do remain static, time is to be viewed as a relative phenomenon, a flexible and a changeable entity (Black and MacRaild, 1997). "The past" in a certain research may be "the today" of a different one, or "the today" of a research may include "the past" of others. Periodization does not block time segments to flow into each other. Historical research focus on a segment of time in which periodization serves to limit the extent of time studied. Since design historical research tends to focus upon the industrial design of the modern age, it mostly deals with the present and the recent past (Walker, 1989). But when does this recent past begin? The number of the different correct answers to this question makes past and present distinction somehow arbitrary. But on the other hand this distinction makes the researcher situate herself/himself in an a-historical vantage point, the present, from where she/he can observe the historical realm of the past (Walker, 1989).

The everyday life as an area of research opens new ways to the concept of "routine". The everyday life consists of routines. The change in these routines asks for new patterns of periodization. Is setting up a case specific periodization system for certain subjects like "the history of design in the Turkish everyday life" mapping the change in the routines via design possible? It is not necessary to have a *certain* periodization system for a subject that can be approached from a vast majority of viewpoints? What is important here is to set the period blocks into right places in the design of the research project. The periodization pattern is to change according to the level and detail of research and the conceptual frame of the study. What the historian needs to be conscious of are the differences which separate one period from the other and continuities which link the two according to the concepts being focused.

Probes to Set the Periodizing Blocks – The Case for the History of Design in Turkey

The conceptual frame in the beginnig of my PhD research was the historical relationship between Turkish modernization and industrial design in the *everyday life*. This was a wide frame and for a more focused study the limitation of the everyday life to "the domestic everyday life" and "the change in the design of domestic household products" in parallel to "the Turkish Republican Modernization" was a decision taken after accumulation of new data.

The historian periodizes the time section he is studying according to the detail and importance of changes he wants

[3] After Braudel, most of the historians of today are on the wing of the inclusion of "everyday life" into history (see Jenkins, K, 2003).

to focus on. If the historian wants to study the time section he has chosen in a macro level, then the periods he determines will be of longer time. The periods he determines has to be of shorter time if he wants to chase the changes in detail. The importance of a change or event differs according to the extents of the period being studied (Tekeli, 1998). The historian has to periodize the time section he wants to study coherent with the aims and objectives of the research in order to make reasoned inclusions and exclusions. Each branch of history writing tends to periodize the past differently according to the posibilities of their chosen subject. When the subject matter is the history of industrial design -stressing different aspects like the physical appearance of goods, ideologies, consumption, production, individual designers or firms etc.- the earliest dates commonly taken in the literature is the beginning of the industrial revolution namely the second half of the 18th century. A telling volume of Design History literature starts with the industrial revolution, division of labour, and say something on Wedgwood, the Great Exhibition, Thonet and then design ideologies like Arts and Crafts and Art Nouveau confronting the general production of the 19th century constituting a similar infrastructure. The end extent of the time period varies according to the scope and the conceptual frame of the author, where even the year of the publishing may be the arbitrary end of time studied. The traditionally set "umbrella period" of Design History in the western sense has been the period between the 1750s and the end of the 20th Century. This makes 250 years which is periodized into many sub-periods according to the researcher's subject and detail he aims to focus onto. The time section of my research inevitably overlaps with a certain period of the umbrella period of Design History in general.

If the subject is the history of industrial design in Turkey, "when to begin" is a hard one to deal with than "when to end". In the beginning of my research I started reading on the late 18th century which is a period parallel to the European Industrial Revolution as well as the early established structural changes in the Ottoman Turkey. A large number of Turkish and foreign historians have been studying these changes in detail and published work in terms of economy, technology, politics and etc is high qualified. Cultural history fn the 18th and 19th century Ottoman Turkey have been a neglected area for sometime, although the past 20 years witnessed a series research and publication on the Ottoman daily life and culture. For an early design history research, begining with the second half of the 19th century as a starting point seemed convenient. The end of the 1950s seemed to be a fitting ending time as my further reading on the existing design history and the general history of Turkey supported. These years were accepted as the initial guidelines for the beginning which was to change when necessary within the course of the research.

Certain patterns promising to act either as "period blocks" or as characteristics of periods to fix the guideline dates of the "umbrella period" to be used in the research, which are exemplified later below, were mapped. Setting 1850 as the beginning period block may seem to be arbitrary when we ask if a period of time have a specific beginning and/or an end?"No matter if a period has a beginning and an end, historical studies include strong temptation to impose neat storylines (Walker, 1989). Setting the first "period block" on 1850 served as a good point to start the story. If industrial design is accepted as a phenomenon of the modern times, modernization in Turkish national economic system, governmental structure, industry and the life of the Turkish society all points to the second half of the 19th century as in certain countries falling to the east of Europe. Starting to trace evidence of design in the modern sense, in a comparative approach with the west, makes the second half of the 19th century a fruitful place to start with. But it is a hard one to relate it to the life of the Turkish everyday because of the lack of archival data.

1950 is not an exact extent for the end of the research, as 1850 is not. Historical studies on the 20th century Turkey point to certain changes that took place in the social structure and everyday life after 1950[4]. The period between 1920 and 1950 is named "the early republican period" in economic, social and political histories of Turkey. Setting the "initial period block" on 1850 and "end period block" on 1950, was a search for the patterns that led to the modernization of the Turkish daily life and its reflection on the design and use of household products. *"Period probe"* is a phrase that I use for the pattern search to fix the period blocks to the right points and intervals.

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[4] Alan Duben's Works on the life of the Turkish family gives deep information on these changes.

When "*the umbrella period*" is decided then come the sub-periods. These periods may be regular units of time such as decades which are random decisions, or be irregular segments of time their beginning and end decided according to the material of history. This material of history can differ according to the subject and the conceptual framework of the study. Natural disasters, economic crises, political changes or new developments in manufacturing systems can be materials fixing end and beginning of a period (Tekeli, 1998). The design historian can elect either to use general economic/ technological/ political segments such as 'the era of capitalism', 'the epoch of the industrial revolution', 'The Victorain age', or to use boundaries more specific to design itself (Walker, 1989).

Historical studies include certain periods like introductory and afterwards since it is usually necessary to review what preceded and what followed the chosen period. But how backwards and forwards should they range? In the following sub-periods proposal, the first period acts as a means of understanding structural changes in the everyday life and domestic use of household products of the following period. The umbrella period 1850-1950 is divided into two sub-periods:

- Pre-Republican Era 1850-1920 as an introductory chapter to the main period of study,

- Early Republican Era 1920-1950, main period of study.

Why "1920" is accepted as a period block is explained later in the following lines. Period probes to decide on these intervals were close to each other for both periods since they were for the same conceptual frame and the same society, but were not the same.

Pre-Republican Period 1850-1923

1850-1923 period acts as an introductory part that helps to make an understanding of the following the Early Republican Era constituting the main period of the research. As I stated above, my aim was to study the historical relationship between Turkish modernization and industrial design in the everyday life. The results of the probes do not maintain the researcher with "professional design activity" but these are the situations that have led to professional design activity in west, and tracing them in eastern as an introductive part is promising and abundant.

Period probes searching patterns of proto-industrial design in the everyday life household products in order to the beginning block time for the umbrella period on 1850:

1- Commercial treaties with western countries of the industrial revolution, and new regulations of commerce and production: New regulations of commerce and manufacture were clearly figured in the second half of the 19th century. Turkey was undergoing a phase of new structural development in terms of military, monetary and governmental system since the second half of the 18th century. By the new reformations of 1839 called "*Tanzimat*,"[5] and the commercial treaties of the first half of the 19th century, "change" versus "inertia" has rapidly taken its place in the industrialization and commodification of Turkey in the modern western sense.[6] Many of the new central institutions of the second half of the 19th century were means of leading the way to the establishment of the Turkish Republic and still have their impact in the social institutional structure.

At the end of the 18th century and in the beginning of the 19th century, the commercial trade with Middle and Eastern Europe in Turkey was more important than the one with Western Europe.[7] The tableau was in a rapid change during the ten

[5] The term means reorganization resembling a period of reformation that lasted from 1839 to 1876.

[6] The ultra nationalist economic approach to the Ottoman history has always blamed the 19th century commercial treaties signed with European powers as the reason for the "under-development" of the "dependency". This scenario with a xenophobic hint and backed by dependency paradigm of Marxism as well as nationalist historiography have been finding the scapegoat of Modern Middle Eastern history in the commercial treaties of the mid-nineteenth century, and mainly the 1838 Anglo-Ottoman Commercial Convention. See Zafer Toprak, "The Ottoman Realities And Economic Mind In The Age Of Nation State (1839-1914)," The University of Athens Doctoral Program in Economics Monday Economic History Seminars 2004/2005, http://www.econ.uoa.gr/UA/files/811318924..pdf (accessed August 18, 2006).

[7] The Empire extended to the Balkans, Anatolia, Syria, Tunisia, and Egypt in the end of the 18th century. Greece already had her independence in 1832 although some regions that belong to Greece today were still under the rule of the Ottomans; such as Thessalonica from where many manufacturers exhibited their products.

decades period between the end of Napoleon wars in Europe and the First World War. Commercial relationship between the Western Europe and Turkey got stronger with commercial treaty conventions. The Ottoman economy was exporting raw material, food substance and alimentary products while importing manufactured goods and certain alimentary products. Hand-woven rugs and carpets are worth of noting as exported manufactured goods. After "*the Commercial Treaty of Balta Limani*" in 1838, Britain had the privilege to export her product into the Ottoman market with a very low duty. Turkish market as a foreign liberal trade arena started to develop after the Crimean War.[8] One of the main Turkish industries was textiles. The local weavers started to use cheaper English fibers and yarns. However, the change in the origin of cotton fibers did not affect weaving industry as one might think of. The English design did not attract local people who went on consuming fabrics with local taste (Pamuk, 1988). The number of the looms increased rather than decreased in the wake of liberal foreign trade (Toprak, 2004). This is arguably due to the traditional consuming habits allocating certain amounts of the market to local manufactures with local taste in general.

2- First domestic industrial manufactures: State supported manufactures and inauguration of imperial factories such as Imperial Beykoz Porcelain and Glass Factory (Beykoz Fabrika-i Hümayun), the Imperial Hereke Rug Factory (Hereke Fabrika-i Hümayun), The Imperial Feshane Garment Factory (Feshane Fabrika-i Hümayun). Products stamped "Eser-i Istanbul" as the first Turkish Trade Mark.

3-Standardization and mechanization: manufactures for military, in garments and the products of the imperial factories.

4- Industrial exhibitions on national and international level: In the second half of the 19th century Turkey participated into world exhibitions first participating in the Great Exhibition of 1851. The reflections of these exhibitions in the mainland took place as the new national exhibitions of industry and commerce beginning with "Sergi-i Umumi Osmani".

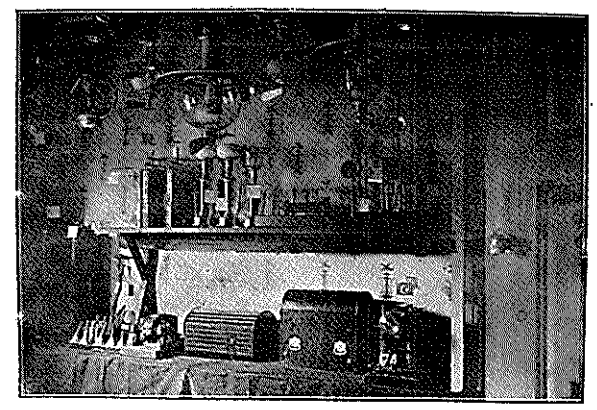


Figure 1. Industrial products of Uşaklıyan Efendi in Bursa Exposition of 1909.

5- Periodical issues on house, home, decoration, appliances etc.

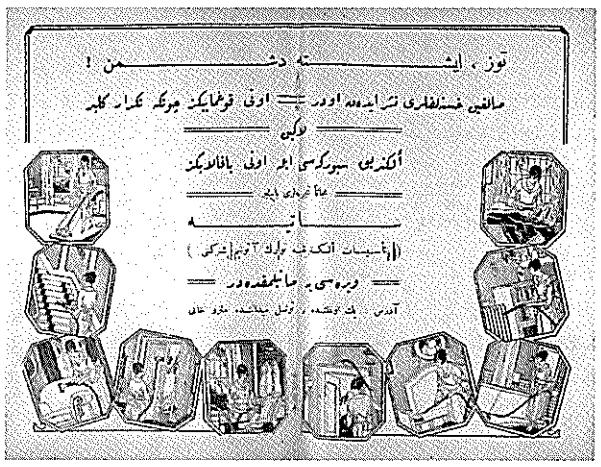


Figure 2. Amel-i Elektrik, 1917, Istanbul.

[8] The Crimean War lasted from March 1853 until April 1856 and was fought between Imperial Russia on one side and an alliance of the United Kingdom, Ireland, the Second French Empire, the Kingdom of Sardinia, and the Ottoman Empire on the other. The majority of the conflict took place on the Crimean peninsula in the Black Sea, with military conflicts also occurring in western Turkey, the Baltic Sea region and in the Pacific Ocean.

6- Advertisements of household products

7- Critics on products by professional e.g. In publications and periodicals of professional institutions.



Figure 3. Amel-i Elektrik, 1917, Istanbul.

8- New architecture and housing policies: New palaces and interior decoration in the western sense. Neo-classical **kargir** houses due to the regulations after the Hoca Paşa Fire in Istanbul in 1865. Introduction of new furniture pieces and related furniture workshops.

Early Republican Era: 1923-1950

The periods of time seem to get shorter in the twentieth century, as the developments of any kind in the realm of design have gained acceleration. "Decades Approach" in historical has been common and Walker (1989) find this 'decades' approach problematical since the historians feel compelled to detect a unique style or spirit of the age in each decade whether there was one or not. In my periodization proposal sub-periods for 1923-1950 is not proposed.

The first period proposed ends with 1923 that is the establishment of the Turkish Republic and the end of the Ottoman rule in Turkey. As stated above periods may end or begin with certain political change. 1923 is not fixed as a period block of the study just because a very important political change has occured. The 1923-1950 is the period when profound changes with the establishment of modern Turkey took place in the society and when 'design' served as one of the agencies in this modernization ideology. A new nation started to be designed with a new Turkish identity. The Turkish Language foundation and Turkish History Foundation were inaugurated serving to form the new identity. Latin alphabet instead of Arabic was started to be used. The literacy of Turkish people with the new education system introduced accelerated. Women got their rights for voting and election while special schools for educating woman as "the modern republican woman" were established. The education system in Turkey was unified under one ministry. New vocational schools for boys and girls were established. The way to dress in western sense was stabilized with laws. Another important point that deserves attetion is that the period of 1923-1950 is also parallel to the western "modernism" in design. Academicians, and professionals who left national socialist Germany started to work in the academies of Turkey in this period.

Period probes searching patterns of industrial design and its relation to the everyday household, for fixing the main period of study extents under the umbrella period:

1. New industry and development plans and laws supporting domestic production.

2. Campaigns and propaganda on the use of domestic products.

3. Design education in fine arts faculties.



Figure 4. Ceramic teaset by İsmail Hakkı Bey, Yedigün 1933, No. 47

4. New housing plans and policies.

5. The gender politics of the Republic.

6. The idea of "hygiene" supported with official campaigns.

7. Change in the use of kitchens.

8. Increase in the periodicals related to "home", "women" and "family". Introduction of modern design through media.

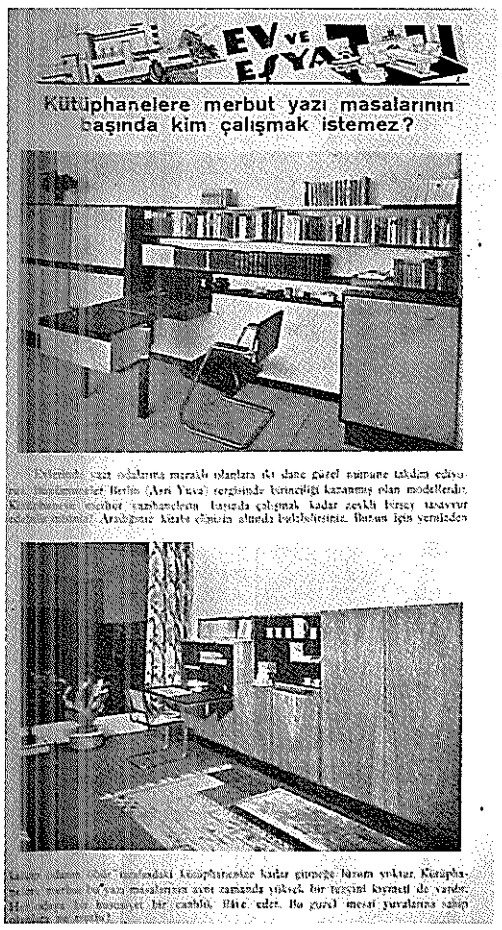


Figure 5. Design news from abroad, Yedigün 1933, No.52

9. Critics on the design of products and advertisements focusing on the physical appearance of the goods.

10. Translations of texts on design.

Conclusion

Here I tried to present the two main periods of my research and depict the story of how I reached this periodization schema. Time periods can not be accounted as an explanatory variant that leads to 'historicism', which is highly unwanted in this research. But periods are needed in order to tell a clear story line. The case of design history in Turkey, does not have very case specific time intervals. The change in the routines is in parallel to the European peripherak countries. The proposed two periods have many similarities with the existing Design History literature (order). On the other hand, the two main periods proposed heredoes not truly fit the general periodization in official national histories and Turkish art history, but offers a new periodization for the early design history of Turkey.

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THE PARODY OF THE MOTLEY CADAVER: DISPLAYING THE FUNERAL OF FASHION

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Abstract

This paper considers the ephemeral, fugitive nature of fashion in the context of documenting and presenting the history of design. Garments breaking down physically defy their original functions of wearability, the ideal image of attractiveness and overt display. Extending the ephemeral, confronts the issues about the very nature of fashion, the design ideas that relate to a time and place.

I propose a parallel exhibition dialogue and witness experience, which considers the detritus. This approach would perhaps create a path leading away from the traditional vista of the museum spectacle or the department store gaze. Within this context the deterioration of a garment is read other than a conservation issue. The radical and irreversible changes that occur through decay propose a framework to consider design the continuing breakdown creates a disorder that cannot be contained, one that symbolically challenges the authority of the museum itself.

The nature of fashion

> "For fashion was never anything other than the parody of the motley cadaver, provocation of death through the woman, and bitter colloquy with decay whispered between shrill bursts of mechanical laughter. That is fashion. And that is why she changes so quickly; she titillates death and is already something different, something new, as he casts about to crush her...' (Benjamin 2004:63).

Benjamin's caustic depiction of fashion[1] opens this discourse, to consider the physical nature of things, the idea of renewal, the object of desire, absence and presence; addressing the radical changes and irreversible transformations that occur in the inevitable funeral of fashion. Referencing the satirical work of Leopardi, Benjamin brings forth sisters Fashion and Death, mythically related through their mother Decay. In the original dialogue their similarities are clearly laid out, the sisters are united through their family trait of destruction and their innate ability to change the world (Leopardi 19B3: 51). In this potent yet rather outrageous association, fashion plays forever with death, her continuing attraction presenting the 'new' 'the very latest' stylish offerings relying on her ephemeral nature and ensuing speedy death. The seduction of fashion's original appeal is rapidly disfigured into a decayed and rotting corpse.

This paper considers the ephemeral, fugitive nature of fashion in the context of documenting and presenting the history of design. Garments breaking down physically defy their original functions of wearability, an ideal image of attractiveness, overt display, commodity value and representation of the latest style. Attempting to reconsider the philosophical, political, aesthetic and commercial values placed on fashion and investigate how these readings impact on the placement of fashion in the museum, this paper gives pause for reflection about the experience of clothing when it is no longer 'fashionable' or pristine. [2]

[1] The incomplete study by Walter Benjamin on the subject of the Paris arcades, see Lehmann for a detailed discussion concerning Benjamin's writing about fashion.

[2] The research for this paper is based on a curatorial project developed for the National Trust of Victoria (Australia) entitled *Noble Rot: an alternate history of fashion* displayed at Como Historic House and Garden, Melbourne Australia from 16 February to 7 May 2006.

Exhibiting fashion in public institutions

The act of collecting, selecting, preserving and in turn displaying fashion, within the context of a public collection, provides a form of immortality for the 'dated'. Extending the ephemeral, confronts the issues about the very nature of fashion, the design ideas that relate to a time and place. However, if fashion exhibitions can only offer a random sampling of the best condition garments, unfortunately then the most used and perhaps the most successful, are discarded due to a lack of newness, these examples are then destined to languish in storage awaiting conservation, or perhaps remain in permanent incarceration, are therefore totally dismissed, never seen. In calling forth these absent histories, it is my intention to invite an alternate view, a transgression to invoke the poetics of decay, the vicissitudes of transformation, the remnants of destruction into the display spaces of a public museum, to question the politics of appearance and the experience of fashion.

Over the past decade the fashion exhibition has become a major cultural phenomenon. Popularity generated through a mixture of slick marketing, extensive conservation, styling, and theatrical and multimedia effects, producing an extraordinary experience, well-attended exhibitions making substantial revenue for museums worldwide[3]. Here the missing pieces are described or replaced, petticoats are remade, clothes are padded and preened, accessories are assembled, and to further create a sense of completeness garments are dressed on mannequins. However the gloss and a constructed or imposed newness placed on objects to look good in an exhibition, understandably bestows these garments a seductive veneer eventually provides a bland offering where everything starts to look the same. The expectation of the museum experience to resurrect fashion is articulated through the continual reliance and identification with a body, to animate the garment and perhaps recall a living memory. The cabinet of curiosities 'a storehouse of knowledge', that formed the basic model for the Museum, where a range of exotic objects were collected in a purpose built cabinet did not include clothing. Instead early references to accumulations of fashion are listed in household inventories, assets that were named and housed in the Wardrobe. (Roche 1994: 73) However the clothing display vernacular is based around the glass showcase and mannequin form, rather than the storage chest, thereby appropriating devices deriving from a retail experience- the world of trade fairs, the dressmaking atelier and the department store. Interestingly the waxworks exhibition provided an influential model, establishing a tableaux format, and defining fashion as an essential temporal mechanism. The waxworks spectacle democratized celebrity culture, introducing effigies based upon the accurate likeness of dignitaries and famous people. These figures were appropriately dressed in sophisticated replica clothing and accoutrements, or in many cases original historical pieces were procured to offer a potent degree of authenticity, and consequently invite a popular experience of time and place (Pilbeam 2003).[4]

As fashion acts as 'an expression of the times', 'measuring the essence of its time', 'capturing the spirit' and perhaps in this most simplistic form, museum collections provide a sequential time line by decade or century. However the adoption of mannequins for the display of clothes and accessories introduces a supplementary element that can be disturbing or inappropriate. Some museums resist the temptation to dress-up mannequins with make-up and wigs in an attempt to evoke another era, and as a result select the simple 'headless' and 'limbless' tailor's form to fill in the costume void. The use of mannequins introduces a further debate about clothing and the relationship to the body and the methods employed to simulate this representation.

Ephemeral

Following a Derridean approach this paper studies the transformational possibilities offered by proposing a parallel exhibition dialogue and witness experience, which examines the detritus and the absent body. This approach would perhaps create a path leading away from the traditional vista

[3] For example *Chanel* staged at the Metropolitan Museum of Art, New York 5/5/05-7/08/05 drew crowds of 463,603. Listed in *The Art Newspaper* annual listing of the world's top exhibition attendance figures at thirteen. CHANEL sponsored the exhibition.

[4] The first waxworks exhibition is recorded in 1756.

of the museum spectacle or the department store gaze. Within this context the deterioration of a garment is read outside the conservation parameters. The radical and irreversible changes that occur through decay propose a framework to consider design and the culture of dress, the continuing breakdown creates a disorder that cannot be contained, one that symbolically challenges the authority of the museum itself.

Standard museological practice selects and parades only the best, curators abiding to strict collection briefs and ethical guidelines.[5] Works in the best condition are preferred, pieces that have survived ravages of time, whims in fashionable taste, are periodically exhibited in a place where the endless process of decay is retarded, where time on display is restricted and lights are turned down low. Yet even in this environment the aging process and the act of disintegration continues, which destroys the original appearance; the ideal new image, the aura of attractiveness progressively fades, dies and morphs into something else. In a museum condition reports document this progress through a language of vulnerability and loss, with descriptions of shattered silk, degraded fibres, disfiguring stains, and insect attacks. When discussing museum collections and the ephemeral nature and vulnerability of the actual fashion objects, it is necessary to address the perhaps obvious questions of selection and survival-'What is preserved and what can be preserved' (Roche 1994: 7) and the rather random, and incomplete selection of items that have survived (Blau 1999: 33-34). The sampling of clothes that have somehow survived and are selected for a museum, provide only a hint of dressing complexities, the fashionable layering of these confections or their arrangement, with the common occurrence of various pieces missing, unfortunately the most used, the most loved are worn out, sometimes discarded, lost forever, leaving only the remains.

> For clothes are so much part of our living, moving selves that, frozen on display in the mausoleums of culture, they hint at something only half understood, sinister, threatening; the atrophy of the body, and the evanescence of life. ...clothes without a wearer, whether on a second-hand stall, in a glass case, or merely a lover's garments strewn on the floor, can affect us unpleasantly, as if a snake had shed its skin (Wilson 1985: 1).

Clothing can cause apprehension, which is not experienced through the viewing of other artefacts. In the context of a museum the absent body, provides quite different readings from fashionable dress observed worn on the streets, marketed in the media, merchandised in a shop, or hung in a private wardrobe. In a public setting like an exhibition where wearing is no longer the rationale, and clothes are no longer a dressed composition, we are left with something else, an abstraction, an object haunted, and the threat of transformation. Consequently in this state of 'absented presence', is where we examine the meaning of what is not represented, the conditions of representation itself. (Heidegger 2004).

Clothing metaphors

Fashions incremental and inevitable decay, the concomitant changing aesthetics of appearance brought on by time and use is something that is charged with potent symbolism. Throughout history clothing is metaphorically appropriated, Lehmann (2000:82) noted throughout the 19th century clothing represented 'beauty, open or repressed sexuality, social aspiration, or moral deviation'. Wilson (2004) identifies fashion's 'magical dimension', the extraordinary element that ignites the imagination, the irrational, and the extreme elements that inspired the Surrealists to translate clothing in a metaphoric way. While clothing representing an allegory for humanity is drawn from the characteristics associated with masquerade or camouflage such as the implication of a deception, a covering up, the secretive, the veil and multiple layers of meaning (Hollander 1993: 446). Another source for poetic inspiration is distilled from the clothing industry itself, drawing from the economic and social structures including the circulation of new clothes to the second hand clothing trade and the collection of rags, imparting a poignant imagery

[5] ICOM (International Council of Museums) 'sets minimum standards of professional practice and performance of museums and staff'. http//icom.museum/ethics.html
Costume guidelines formulated by the Costume committee offer basic standards of care, and display ethics that are adopted by museums worldwide. The intention of the document, which was last updated in 1998, is to assist curators and museum management dealing with fragile costumes.

which documents a trail running from luxury to'abject misery'. (Roche 1994: 367) The rag picker is discussed by 8enjamin (1989: 79), to epitomise the motif of the down trodden yet picturesque scavenger, who wandered the streets seeking out materials for recycling and revival, picking through the cultural detritus left behind by capitalist societies. Marx employed the clothing metaphor in his theory of commodity fetishism and the hieroglyph of value. The story of the linen seller and the coat wearer illustrates the veneration which industrial society has towards the product, over the alienation of the worker who laboured over its production (Roche 1994: 518).

Of particular interest from this genre is the satirical novel *Sartor Resartus* or the Tailor patched (Carlyle 1948: iv), which is cleverly structured around the history and vernacular of clothing cultures, suggesting that the fabric of life is reflected through this construct. In the character of the make-believe Professor Teufelsdrockh (Professor Devil's dust)[6], Carlyle proposes a philosophy of clothing,'the grand Tissue of all Tissues, the only Real Tissue'. Bossche (1991) suggests that Carlyle's clothing metaphor 'represents the fundamental historicity of cultural institutions and the inevitability of periodic revolution. Since nothing can prevent the processes of decay that destroy old clothing. *Sartor's* persuasive organic imagery suggests that revolution and historical change are natural, noncataclysmic processes.' Playfully throughout the novel Carlyle[7] refers to the occurrence of clothing sans a wearer; in these departures he observes the fetish value, and status symbols of particular costume types and engages in the notion of reverence and idolatry. He claims: 'That reverence which cannot act without obstruction and perversion when the clothes are full. May have full course when they are empty' (Carlyle 1948: 180).

As a result of these observations Professor Teufeldrockh's categorizes this displacement from the body, crafting a clothing nomenclature released from the burden of humanity, now a void or a receptacle of memory, subsequently christening these vessels with titles like 'an ornament', 'an architectural idea', 'shells', 'the outer husks of bodies', 'cast clothes', 'past witnesses', 'instruments of Woe and Joy', 'the hollow cloth garment', 'empty clothes' or 'ghosts of life'. (Carlyle 1948)

> What still dignity dwells in a suit of Cast Clothes! How meekly it bears its honours! No haughty looks, no scornful gesture: silent and serene, it fronts the world; neither demanding worship or afraid to miss it. The Hat still carries the physiognomy of its Head: but the vanity and the stupidity, and goosespeech which was the sign of these two, are gone. The Coat-arm is stretched out, but not to strike; the Breeches, in modest simplicity, depend at ease, and now at last have a graceful flow; the Waistcoat hides no evil passion, no riotous desire; hunger or thirst now dwells not in it (Carlyle 1948: 181).

Carlyle's descriptions allude to a state of redundancy where the empty state of the clothes implies dereliction.

Decay aesthetics

The potency of ruins, the aesthetics of decay, and their study and reflection, is an intrinsic part of Western cultural tradition stemming from antiquity (Lyons 1997, Woodward 2001). Buildings devastated by human interventions or lack of intervention, or the degrading forces of nature over time, elicit an emotional charge generated by a nostalgic longing for that which is lost, a sense of abandonment and a blurring and redefinement of visual boundaries describing beauty and value. To Western sensibilities ruins reveal the susceptibility and impermanency of civilization. In contrast to this view the Japanese aesthetic concepts of *wabi* and *sabi* which also draw on the vestiges that time produces, conceive time as a cycle of natural flux: the beauty found in the patina of the worn, the surfaces of the decaying or the absence in the imperfect are admired (Crowley: 3-4).

The ephemeral nature of fashion is intrinsically related to its fugitive construction - as soon as it is made it starts to

[6] Devil's dust was produced by the woollen manufacturers when they converted old clothing rags into cloth called shoddy, the process created clouds of dust, which consequently caused a major health problem, an aftermath of the industrial revolution. Carter suggests a possibility for the origin of this insidious name is found in Engels, The Condition of the Working class in England 1844 (London: 1892).

[7] For an intensive study of Carlyle's work in the context of Dress studies refer to Keenan and Carter.

disintegrate, to age, to change colour. Surfaces distort and perhaps break down. Eventually everything falls apart!

The reaction and response to the breakdown of fashion can range from keeping items from view, discarding, or conservation. Garments breaking down physically defy their original functions of wearability and overt display. In its place these objects can convey the abject, and the picturesque concurrently through the act of transformation and disfigurement. Studying language and the application of particular terms used to articulate ideal or unfavourable personal attributes, shows that these are intrinsically linked to condition. The term *respectable*, for instance is connected to dressing in a proper way. Clothes well maintained and tidy are a reflection of the body within. The fashion vernacular aligns negative associations with a change in condition, an altered condition or a less than perfect one. Phrases 'dressed in rags' or 'in tatters'[8] are maligned states, in which clothing and its deteriorating condition is linked, historically, to the morals of man. The word *stain* brings into play the most extreme cultural standards (Douglas 1980) relating not only to hygiene, but purity, moral and social order. Historically fine clothing is a marker of social status and morality. A stain is provocative in the way it disturbs, the way it mars a surface. Dirt has long been viewed as an enemy. It threatens appearances and the status of respectability. It causes work, and effort through the duty of care. Freud (1995: 734) has suggested in regards to this obsession with eradication of dirt that " we are not surprised in setting up the use of soap as an actual yardstick for civilization.' Fashion's dark secret is the continual struggle with and demands for an ideal image; looking good, maintaining the best condition through cleaning and storage- prolonging an aesthetic of beauty that demands the control and continuance of pristine fashion surfaces. A garment's condition is impregnated with responsibility and value. Donations to a museum collection for example are often generated through the moral obligations experienced by the family who feel overwhelmed by the duty of care placed upon them and the threat of neglect, consequently gifting an item, in anticipation that the institution will return it to it's former glory. The Miss Havisham scenario introducing the withered and yellowed wedding dress coordinating successfully with the occupant is a ghastly reminder of the fate of old clothes.

Haunting device

However the concept of clothing as a haunting device (Jones: 14) serves to represent the previous wearers even though they have long departed and reveal the 'spirits of the past'. (Derrida: 26) The 'cast-off clothing', 'empty dress', 'ghosts of life' are no longer connected to the living but bear their marks. The interior of a garment is a privileged surface, which offers an aspect of familiarity known only to the maker, the cleaner, and the wearer and perhaps the curator. It is the most intimate surface of clothing, touching the body. It is a façade that conceals and reveals the mysteries of construction, and knowledge of the lining, guards the maker's label, protects the visible stitching trails, the repair secrets and alterations, and shrouds the stains and signs of wear. The interior has the intimacy and breath of the wearer upon it. A garment inside out or outside in can reveal how a shape is formed, why fabric falls in a particular way. Its complexity can be quite astounding, contrasting a modest aesthetic rendered through humble materials and colours drained by wear and washing, that often contradict the impressive exterior.

By contrast museum condition reports document a garment or accessory within the criteria of degradation, damage, previous repairs, alteration, soiling (surface) and staining (penetrating) with degrees of severity from minor to major, good, fair or bad.

There are listed activities to stabilise these conditions, proposals to make the work strong again, revive it, to restore its appearance. Yet these maligned states also mark out other activities or events, histories that recall past textile technologies, the essence of fragility and record the way a garment wears.

Naturally there are many signs, traces of a former use are left behind which imbues the garment with the presence of the wearer: staining caused by splashed champagne, tea or rain; mud engrained on hems; jam dribbled on a child's dress turns black with age, while smoke eventually rots through a 19th century skirt. Coloured dyes morph into bizarre hues exacerbated by heat, damp or strange chemical breakdowns. Black follows a faded journey, white withers, spots, and yellows. Rubber perishes and gelatine sequins dissolve.

[8] Tatters, refers to torn and ragged clothing. Atatterdemalion was a ragged child, person dressed in old clothes, in use from 1608.

Coloured dyes morph into bizarre hues brought on by heat, damp or strange chemical breakdowns. Skirt trains trap mud from the streets, keeping it away from the finer materials. Inside delicate nineteenth century silk bodices rubber sweat pads protect the fashionable garment from bodily fluids, and the horror of underarm discolouration.

The darned, patched, recycled, dyed and worn document the cycle of clothing culture as garments are revived, clobbered and translated over again to renew. The Second-hand, the Third-hand and so it goes on...

Inevitably the care and maintenance of clothes is critical to achieving standards of appearance, longevity of material assets, and sustaining the 'new' look. This certainly is no simple undertaking. Historically it involved complex, time consuming processes; cleaning, mending, plus putting clothes correctly away, in and out of storage (Walkley 1978). Contemporary care labels list stoically the fibre content and recommended cleaning and preening methods, while wardrobe and storage specialists offer efficient systems for packing clothing away or discarding unwanted items.

Contemporary design and referencing the worn-out

A garment's shifting surface and construction can create extraordinary compositions from the formulation of shredded silk surfaces to the patterning formed by ironmould.

Fashion designers have responded to the process of aging and the transformation of fashion as an aesthetic device but also one that can be appropriated to charge an item with political and social meaning by unsettling the status quo. In response to the fetishist desire for new clothes and the status of appearance for instance Malcolm McLaren and Vivienne Westwood in the late 1970s concocted an anti-establishment aesthetic based around the irregular and the worn out, selling t-shirts and trousers that were soiled, ripped and decorated with worthless objects or out-of-date trims. The 'destroy' shirt is perhaps the most recognized example of this genre, best remembered as the uniform of the notorious Sid Vicious in the punk music group the Sex Pistols.

Contemporary designers continue to exploit the aesthetics of decay for example Rei Kawakubo of Comme Des Garcons, Hussein Chalayan, John Galliano, Martin Margiela and Jun Takahashi, seeking the patina and palette of the worn and the discarded.

Evans (257) has observed that' rather than simply configuring images of dereliction, these designers introduce the idea of narrative and history into their clothes.'

Perhaps the most interesting response to the organic and ephemeral is from Martin Margiela[9] working with a microbiologist he created a museum installation where clothes modelled from recycled 'old' clothes were sprayed with various types of mould spores, and placed in conditions to encourage their growth. Consequently the garments were installed outdoors and continued to evolve throughout the course of the exhibition- resulting in the creation of 'living' garments.

Artefact experience

Warhol's interventions in the Museum environment, offered a controversial stance against conventional institutional policies relating to display and conservation through his preference to present things to 'look as they are'. His personal collection displayed in the *Folk and Funk exhibition*[10] documented an eccentric preference for accumulating artefacts that revealed signs of use, misadventure, or even a fabrication fault. (Ostrow 1969) In the exhibition *Raid the Icebox 1*[11], his predictably

[9] Martin Margiela: 9/4/1615 Museum Boijmans Van Beuningen, Rotterdam June 6-August 17 1997. For details of the exhibition and a critique of Margeila's work see Caroline Evans, The Golden Dustman: A critical evaluation of the work of Martin Margiela: Exhibition (9/4/1615), Fashion Theory, volume 2, issue 1, 73-94.

[10] Andy Warhol's " Folk and Funk" staged at the Museum of American Folk Art 20/9-19/11 1977.

[11] *Raid the Icebox 1* staged at the Museum of Art of the Rhode Island School of Design in 1969, selected by Andy Warhol from basement storage. The exhibition included the holdings of the entire shoe collection, housed in the original museum storage vessel, all shoes were displayed in situ with no special preparation, and visitors were invited to open the door of the cabinet and peer inside. Warhol insisted that full cataloguing details were researched and published for all exhibits, making no distinction between entries for the rubber galoshes or the Cézanne painting, ignoring traditional hierarchies of artistic practice.

unconventional approach and sometimes overtly subversive choices, confronted the practise of the expert and museum professional (Bright 2001: 280). By selecting entire collections of objects including their storage vessels, acknowledged fakes, multiples of the same object, items of varying condition, and 'value' Warhol proposed another trajectory for museum artefacts to be observed. Forging a narrative outside the usual hype surrounding classification, and labelling, where significance is oversimplified by referencing bland descriptive terms like masterpiece, priceless, rare, and treasures, instead Warhol's curation placed emphasis on the evidence of experience (Bright 2001: 288).

When reconsidering the scope of public dress collections in regards to content, access and approach, it is perhaps pertinent to consider what is missing?

Maynard (1994: 4) has argued that everyday dress is not well represented, and that collections contain a predominance of the more expensive, high fashion garments. My argument in this paper is not simply about institutional collection policies but to further investigate how the collections are presented, prepared and consequently perceived. For instance in current practice the acquisition rationale aligns with condition, 'value' aesthetics, which favours identifying garments which consequently reveal the minimum signs of wear or aging or can respond well to remedial work within a restricted financial and time regime. This established doctrine of best condition, is further articulated and reinforced through consistent use of mannequin display, which relies on clothing in a premium state. A strategy, which further emulates the shopping environment, and the window display of a new product, in contrast to Warhol's museum philosophy, where an object was recognized for it's worn patina or irregular characteristics.

Conclusion

My purpose by placing fashion in the museum outside of the body is to negate the demands of appearance that the body commands, which potentially positions 'past' 'old' fashion in an anti-fashion role, where clothing can age and the traces of experience are exposed. Why not view garments splayed on the floor, lying in a drawer, inside out, or positioned in a dishevelled state? In my alternate narrative the well-preserved exquisitely crafted are juxtaposed with items that are darned, patched, recycled or worn out. In this scenario possibly the consideration of fashion's funeral proposes a pathway to present metamorphosis? My subversive methodology attempts to further examine the guidelines and protocols underlying the museum experience, to re-imagine the conventional vision of historic fashion, from the choice of artefacts, exhibition design and their display. In this dialogue it is my purpose to broaden the presentation of fashion cultures, explore notions relating to image and reality, the seen and the unseen.

My intention outlined in this paper is to set the modishness of fashion against the ephemerality and wear and tear of the clothes themselves and provide a crucial intervention in the usual expectations and presentations of fashion and museology itself.

'Clothing is a worn world: a world of social relations put upon the wearer's body...clothing reminds' (Jones 2000: 3).

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HOW OFTEN DO YOU WASH YOUR HAIR? DESIGN AS DISORDERING: EVERYDAY ROUTINES, HUMAN OBJECT THEORIES, PROBES AND SUSTAINABILITY

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Abstract

New objects can create disorder in our lives - particularly when we try to appropriate and make sense of newly developed products that do not fit our routines. Ultimately, through exploring objects' affordances, our relationship to them develops into a routinised practice - we no longer reflect on them. Hair care is universal and (often) an 'ordinary' part of our daily routines. Our cleanliness routines consume resources and therefore are implicated in the issue of environmental sustainability. However, routines are complex and difficult to change when they are set in a culture of individual consumer choice. The disorder inherent in the process of appropriation raises the possibility that design might deliberately create a useful 'disorder' in routinised practices to facilitate sustainable strategies in everyday life.

The paper proposes an approach of investigating routinised practices in relation to deliberately creating disorder in everyday routines and practice theory. Further, it outlines a pilot study that uses the design-led method of 'probes' and considers its potentials in generating disorder. It identifies creative disorder in the process of designers developing the probes, participants interacting with them to finally designers receiving the results. Thinking about the process in terms of disorder is seen to be valuable in facilitating, applying and developing probes, not only to inspire the designer but also to sensitise the designer to private and intimate areas of everyday life such as hair care.

Introduction

Hair care is universal - even deciding never to wash, cut or style your hair is a form of 'caring' that is defined by conventional practices. Hair care is also (often) an unspectacular and 'ordinary', part of our daily routine.

> *My hair care diary entry: Wednesday 29.03.06*
> *Round one: A clean day? Getting out of bed - straight into the shower. I turn it on. Still with my eyes half closed, tumbling from one foot to the other, I am trying to get my hair wet without falling asleep. Grabbing for the big tube and squeeze - a big blurb of cleaning product on my hands - uncontrollable in the morning. Washing my hair and body once, twice (this time I watch out and actually can control the liquid coming out of the bottle). I am somebody who needs two towels in the morning: one around my head, the other bigger one to dry myself and keep my body warm. End of round one.*

In doing these routines we interact with a variety of tools, facilities and fluids whilst carrying out a variety of activities in relationship to particular parts of our body.

Questions such as 'what are my tools for hair care?', 'when should I care for my hair?', 'what hair should I care for?', 'why should I care for my hair?', 'how do I do my hair care?' are often

unconsciously answered, as they 'go under' in our daily routines (Shove 2002). However, when something in the context for our hair changes, a special occasion, a visit to a friend, perhaps even a trip to the supermarket, these questions may come back into people's consciousness and can create 'disorder' in people's hair care routines.

Such questions may also need to be answered when using unfamiliar bathrooms:

> *My hoir core diory entry: Monday 23.08.06*
> *Hoir care in Germony: Bothrooms in Europe look the some so I should be oble to do my morning routine of looking after myself quite easily. More than once, I had to learn that this is not the case. More than once, I had to learn this the hard woy: does the top need turning to the right or to the left, will the woter come stroight at me or will it flow out of the bothroom top first, will the water be hot or cold, what needs to be turned, pushed or squeezed in order to channel the water through the showerhead ond not through the bathroom tap?*

Trial and error, tacit knowledge, former experience and immediate feedback mechanisms such as a cold jet of water on the back guide people in the process of 'getting to know' a new environment, or new appliances and objects. An unfamiliar place that causes a 'disorder' of our hair care routines may force an adjustment and a re-think of the daily routine in order to accomplish at least part of the routine of having a shower and washing our hair.

This paper builds on research with Boots the Chemist UK to develop an understanding of the multi-relational elements that constitute the practice of hair care and explore opportunities for changed practices linked to sustainable design. Our cleanliness routines consume resources and therefore are implicated in the issue of environmental sustainability. Showering and bathing accounts for 17%-18% of the daily domestic water consumption in the UK. On average people spend seven to eight minutes under the shower whilst power showers pump out between twenty and fifty litres a minute. These figures for the water consumed in showering account for only part of the resources consumed in hair care as, among other environmental impacts, they omit the energy consumed to heat the water or to power hair care appliances and the waste produced from used packaging or unwanted appliances. Whatever its precise level, the amount of resources used in hair care is not a 'given', indeed, trends such as daily showering and the use of power showers have displaced traditional British bathing habits (Shove 2003).

Sustainable design strategies often disregard the significant environmental and social implications of products in the use phase (Sherwin et al 1998). The Demi website (Fletcher et al 2001) documents design for sustainability principles, strategies and ideas, noting that the principle of efficiency, which emphasises improving the environmental profile of products and processes such as design for disassembly, recycling and dematerialisation, choice of material and designing life cycle efficiencies should not be the only focus of design for sustainability. These approaches concentrate on technical innovations that try to reduce the environmental impacts of manufacturing and disposal, but ignore the more slippery phase of use. To design for sustainability in the use phase requires a change of emphasise from manufacturing processes to everyday behaviour and routines. However, routines are complex and difficult to understand and in principle difficult to change when they are set in a culture of individual consumer choice.

We do share routines, in hair care among other activities, by virtue of the ideas we share, the technical systems we buy into and the equipment that is available to us (Shove 2003). These routines decrease improbabilities and order our lives, for good or ill. According to Ilmonen (2001:17), people are 'imprisoned by learned routines,' that accrue over a long period of time until they are conducted unconsciously and non-reflexively. The notion of disorder runs through the paper. The first section of the paper proposes an approach to exploring routinised practices in which design might deliberately generate a creative 'disorder' in routinised practices to explore the potential for sustainable design in hair care, concentrating particularly on Ilmonen's (2004) model of appropriation and on the 'practice theory' laid out by Reckwitz (2002). Further, it reviews the literature on 'cultural probes', especially Gaver et al (1999, 2004) and integrates discussions of concepts relating to everyday routine. The second section draws on the notion of disorder and Gaver's et al (2004:55) 'multi-layered process

of expression and interpretation' to evaluate a pilot study that is inspired by the principles of participant-completed probe packs[1] to explore ways of doing hair care at home and reflect on the probe design to aid the development of future probes.

To conclude, the paper identifies useful disorder in a number of respects. The designer's drawings or graphics within the probe intentionally disorder the participant's routinised thinking about hair care. The participant's response to the probe is also disorderly in that their activity cannot be predicted or controlled and the returned probe may create disorder in the researcher's assumptions about the subject.

Besides this broadly empirical aspect of the process, there is a further emphasis on recognising the potentials of using probes as creative 'disorder' to move from designing the probes to gaining information and/or inspiration from the returns, as discussed in Mattelmaeki et al 2002, Westerlund et al 2003, Graham et al 2005, Gaver et al 1999, 2004.

Disorder, routines and practice theory

dISoRdEr - a lack of order can relate to people, situations, and/or objects and the environment they live in. People can be disordered, create disorder or be disordered by their surroundings. Being disordered might be associated with feelings of confusion, disarray, and uncertainty. Disorderly people could be described as being untidy, chaotic, without restraint, unruly, undisciplined. Finally, people can be involved in communal disorder for example in riots or revolution. People can also 'disorder' objects by deranging or dismantling them and can disorder other people, themselves and situations by being unpredictable, behaving out of the norm or against the law. To summarise, people can create disorder, be part of disorder and be disordered.

Objects can play a part in creating disorder. Whereas the sociology of consumption has often stressed objects' symbolic value as a mediator in people's relationships, particularly for social distinction (Ilmonen 2004), the materiality of objects and their arrangement can play a more active role in their relationships with humans. Work on human object relationships has invoked concepts such as domestication (Silverstone 1992), scripting (Akrich 1992) and affordances (Fisher 2004) to discuss the active and passive role of people and objects in these processes, as well as Ilmonen's writings on the process whereby objects are appropriated. This appropriation can trigger disorder. This paper concentrates on states of routine and disorder by drawing on a simplified version of Ilmonen's model of appropriation and noting ways in which objects can be irregular, unfamiliar, disarranged, and unpredictable.

Ilmonen's model has four stages. The first stage involves acquiring an object from the market and in the second people actively appropriate new objects and fit them into their existing ways of life. It is in this stage that new objects can create disorder, as people make sense of them and adapt them to their routines. After fully appropriating the object in our lives during the third stage people are able to routinely use them and start to learn how to apply them in new ways. Finally, in the fourth stage people are capable of inventing new use situations. This process of appropriation can influence our relationship to object – they become ours and additionally they can alter the practices, the ways of doing and saying, in which we are active.

According to Reckwitz (2002:252), people 'carry' practices, in other words practices exist through people's routinised bodily and mental activities, their understanding, know how and desiring. This implies that people are neither self-directed and rational nor 'judgmental dopes who conform to norms' (2002:256). Practice theory adds detail and subtlety to the analysis of the dynamics and changing patterns of everyday life and may provide a useful vocabulary and framework through which to understand existing routines, ideas, objects and actions such as hair care. To use an analysis based on a practice theory approach in designing and developing strategies for sustainability seems exciting and appropriate. Firstly, in practice theory subject-object relations are seen

[1] Probes packs are packages of open-ended, creative activities that participants engage with on their own terms and in their own time, including creative tasks such as maps to complete or cards to fill in, as well as cameras, photo-albums and postcards. Ultimately, the ambition is to develop new areas for design by provoking 'inspirational responses' from people (Gaver et al 1999).

to be as significant as subject-subject relations. Secondly, it recognises the significance of ordinary, unconscious and unreflective interaction with objects within practices. Thirdly, the theory of practice combines an ability to account for both reproduction and innovation of practices that may lead to a practice changing. This last would invoke the principle that Reckwitz identifies whereby practices change through the "'breaking' or 'shifting' of structures" through "everyday crises of routines". Reckwitz emphasises the role that lack of knowledge or 'interpretive indeterminacy' plays in such crises (2002:255).

Disorder, cultural probes and practice change

The disorder inherent in the process of appropriation raises the possibility that design might deliberately bring about a creative 'disorder' in routinised practices and that this might have particular merit in the context of sustainable design in the use stage. This 'disorder' in routinised behaviour may cause an adjustment and re-think of our daily cleanliness routines. Over the last years the design academy has developed new methods of design research as aids in the design process. These methods attempt to reveal insights into lived experiences and opportunities for design. In the second part of the paper the authors consider the design-led method of cultural probes and its potentials in generating disorder.

Cultural probes have opened up new ways of thinking about design-led research methods that can work alongside, or contest, more reductive science and engineering based approaches to designing and research. Cultural probes are packages of open-ended, creative activities that participants engage with on their own terms and in their own time, including creative tasks such as maps to complete or cards to fill in, as well as cameras, photo-albums and postcards. Bill Gaver and colleagues at the Royal College of Art invented cultural probes to challenge traditional methods in their potential firstly to question preconceptions of technology itself and its definition through culture, function, aesthetics and politics and secondly the 'dubious stereotypes' that exist when designing for unfamiliar groups (Gaver et al 1999, 2004:54).

Sociologist and designers have adapted and re-interpreted probes for a variety of settings and design/research projects to understand something of people's lives, values and aspirations (Joensson 2004). However, there are clear distinctions between Gaver's et al work and these adaptations. For instance, Graham et al (2005), Mattelmaeki et al (2002), Westerlund et al (2003) highlight the potential of gaining informational data by combining probes with interviews and criticise the 'lack of formal analysis' in the probe technique (Mattelmaeki et al 2002). The more instrumental use of the probe method in the adapted approaches has led to Gaver et al (1999, 2004) emphasising the uncertain, ambiguous, and subjective nature of probes, criticizing this 'tendency to rationalise' the method (2004:53). Fundamentally, Gaver's et al (2004:53) approach to probes emphasises 'the notion that knowledge has limits'. The returned probes provide 'fragmentary clues' about the participant's lives, experiences and routines and as such inspire and offer opportunities to discover new design.



Figure 1. The dream recorder (Gaver et al 2004)

The notion of disorder relates to the idea of applying probes in the design process in two ways. The concept of inspiration and the ability to enable people to become aware of and transcend their usual way of thinking and living seem to go along with possible interpretations of disorder, for instance lack of order, abnormality as well as being unfamiliar, disarranged and unpredictable. This idea points to a question that Gaver answers himself concerning the reason for 'deliberately confusing' people and the designer. He reasons that the purpose of this confusion is 'to prevent ourselves from believing we can look into their heads' (Gaver et al 2004:55). Furthermore, he illustrates in the model of 'expression and interpretation' the process of creating complex meaning through the merging and separation of meanings between the designer and the participant.

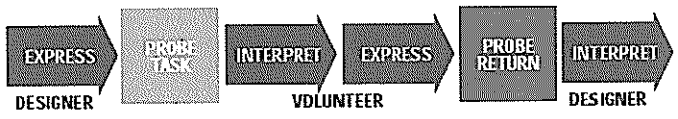


Figure 2. 'Multi-layered process of expression and interpretation' (Gaver et al 2004)

Carefully designed probe tasks reflect an articulation of the designer's thoughts and ideas. The participants have to interpret the designer's form of expression and by undertaking the tasks they express theirs. These interpretations and reflections are finally reflected in the returned probes often challenging the designer's own perceptions. In the process, it might be difficult to take apart who or what is actually disordering who or what. To emphasise this, Joensson (2004:24) draws attention to the 'friction' included in the probes that potentially can encourage participants to view their environments, situations and objects in a new light 'with new glasses'.

A pilot study – disorder in hair care

There follows an outline of a pilot study into hair care that adopts the design-led method sketched out above. It explores the dynamics of disorder between the participant, designer and probe – who or what is actually disordering who or what. In other words, it examines the activity of people or objects creating disorder, as well as being part of the disorder and being disordered by the process. This reveals that these aspects of the process do overlap and this analysis might simply provide a way of thinking about the process that aids the development of future probes. Further, there is an emphasis on recognising the potential benefits of using a creative 'disorder' to gain information and/or inspiration from the returned probes. The outline draws on Gaver's model of 'expression and interpretation' to examine what is happing in the process of designers developing the probes, participants interacting with them and finally the designers receiving the results.

The pilot study so far has involved introspection, keeping a personal hair care diary interviews and probes.[2] The process of designing the probes was influenced by Reckwitz's (2002) theory of practice and Shove's (2002) work on laundering as a system innovation. Shove particularly highlights the integrative nature of materials, conventions and temporal arrangements and further the evolution of ideas, actions, and provisions in everyday routines. While trying to keep the aesthetics of the probes true to their origin of Gaver's et al work, the pilot study attempted to freely run through their several interpretations, using probes as informational data, as inspirations for design or as a transcending method to enable people to go beyond their usual way of thinking about hair care. As a result, the probes were somewhat innocent and experimental.

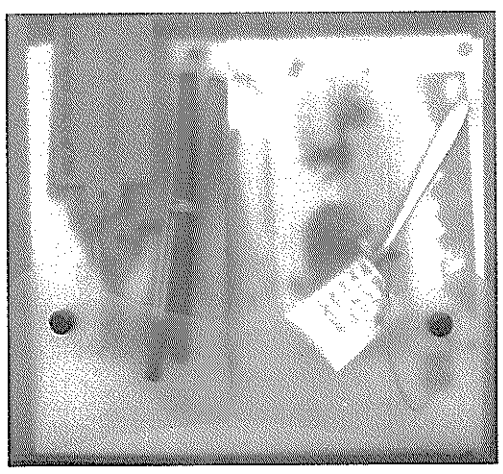


Figure 3. Probes pack

Expressions of the designer - the designer intentionally disorders participants

In the pilot study some of the design 'expressions' comprised the material of the probes, which consisted of different formats of paper (cut into shape, folded, in different sizes, textures and colours) and objects such as cameras, postcards and labels. In order to engage in the tasks - the participants had to use the probes during their everyday routines of hair care, comment on images, use their imagination to draw ideas, take pictures in their

[2] The sample of the pilot study for the interviews so far consisted of six non-experts of hair care: three male and three female between the ages of 25-50 and one hair care expert of the formulation team from Boots the Chemist. The sample of the probe study consisted of six participants: two male and four female between the ages of 25-35. One participant out of the six did not return the probe pack.

home, and write stories. Each task included a short description of what it involved, the information kept short and open to leave room for interpretation. The probes in the projects outlined above varied from collections of coloured pens, glue, drawing pads and post-it notes in the probe packs and an approach that valued and emphasised the aesthetic used (Gaver et al 1999, 2004). The reasoning for the designed aesthetic in Gaver's et al (1999:25) probes was that it not only made them more 'appealing and motivating' but also in presenting the probes informally the design team 'opened up' a quasi subjectivity to the participants to encourage them to reveal their own.

The pilot study's graphics and formats were inspired by the object of study and varied from being informal and illustrative to representing recognisable visuals and symbols. Gaver's et al (1999, 2004) approach to probes draws on the traditions of the art and design world, for instance using allusions to surrealist art that emphasises the unconscious mind, dream-states and absurd juxtapositions. The probes were kept 'abstract' to help trigger the participants into taking a new view of everyday life (Gaver et al 1999, 2004). One of Gaver's et al probes exemplifies this. The participants were meant to produce a diagram that represented their individual relationship to their family members and instead of simply listing these relationships, they were presented with the graphic of 'a cricket pitch' (Gaver et al 2004). The ambivalence between the graphic and the family relationships caused by the designer's 'expression' in the probe has the potential to create disorder by creating a rupture in the participant's un-reflective day-to-day thinking. Similarly, in the pilot study the probe related to visualising the position of private and public activities of hair care in a 'castle and keep' illustration that created disorder or rather confusion in the participant's usual way of thinking.

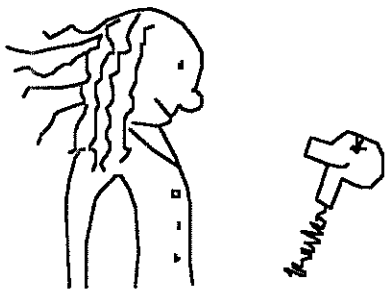


Figure 4. Drawings



Figure 5. Familiar images

Visualise the position of private and public activities of hair care in the 'castle and keep' illustration!

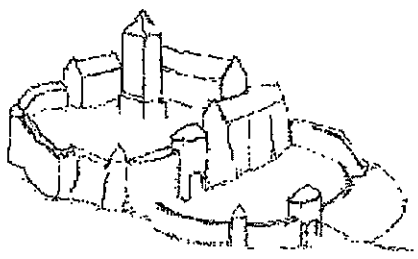


Figure 6. Probe: Example of an ambivalence between graphic and context within the probe intentionally disorders the participant

In addition to creating ambivalence between graphic and context in the pilot study, the designer provided an already invented situation in the form of a drawing or a fictional scenario. Here, disorder might be caused by the fictional nature of the invented situation. The participants had to interpret the sometimes obscure visuals imaginatively to write a story giving their view. These fictional scenarios have some similarities to vignettes used in some interview-based research. These fragmentary short stories about imaginary characters in specified situations help to elicit normative statements due to interviewees commenting on an external situation rather than on themselves (Finch 1987). The interplay between real and fiction represented in the probes seems very important. On the one hand, in using recognisable symbols the participants could relate to the context of the fictional representation whilst providing a space to transcend their usual ways of thinking and elicit norms about hair care. However, some of the returns were left empty, indicating that the participants may have lost interest or found the task too ambiguous to engage with. This demonstrates either a need for the support that can be provided in interviews where vignettes are used or the need to develop more engaging probes.

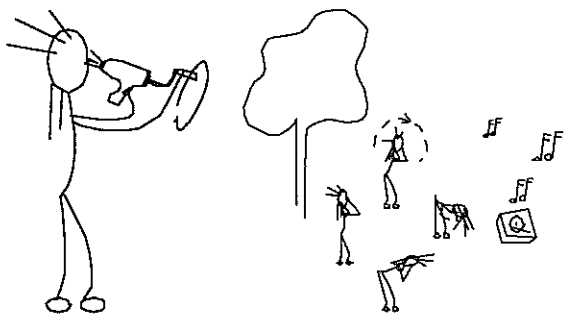


Figure 7. Fictional drawings

Imagine you are on a tent holiday! Write a card to a friend – describing your hair care experience!

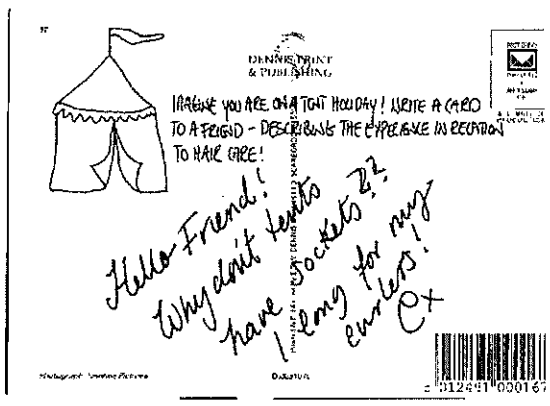


Figure 8. Probe: Example of the designer's graphics within the probe intentionally disorder the participant

Participants interact with probes – interactions cause disorder

In the above probe developments the dynamics of disorder, the potential to confuse the participant productively, are represented in the 'disorder within the probe' expressed through the designer's drawings or graphics. These drawings and graphics might represent fictional scenarios or create ambivalences between context and graphic. The aim is to encourage the participant to view their routinised hair care practices in a new light. This consideration is expressed in the probe returns and finally inspires the designer. Further, the interaction between participant and probes can be part of the disorder. The designer creates a probe for the participant to consider and use in an everyday activity such as a 'once a week shampoo' that was applied in the pilot study or a 'listening glass' that is held to the wall to listen and record what is heard (Gaver et al 1999).

A new revolutionary product – use this shampoo and you only have to wash your hair once a week.

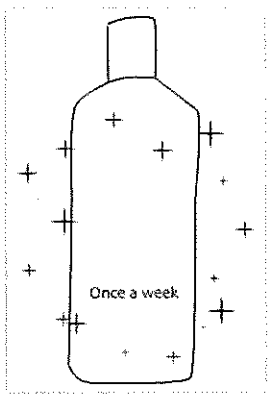


Figure 9. Probe: Example of the participant response to the probe is disorderly in that their activity can't be predicted

The probe is used as an object to disorder the participant's usual ways of doing things - hair care in this case. Indeed, the probe creates the kind of disorder that has similarities to the second stage of Ilmonen's (2004) model of appropriation and has the potential to create what Reckwitz's describes as times of 'crises of everyday routines' (2002:255). Here, the probe presents a new product that people actively try to 'fit' into existing ways of knowing, conventions, temporal arrangements and the 'complex' of objects used to realise the practice of hair care. As a result, the interaction with the 'probe object' creates disorder, or a potential crisis of everyday routine. In the process it provokes routinised behaviour to rise to a state of consciousness. These patterns of behaviour embodied in practices rely on 'expert' knowledge that is literally 'scripted' into the objects involved – instructions on the bottles and mechanical configuration of devices for instance. Reckwitz emphasises the role that lack of knowledge -'interpretive indeterminacy' - plays in such 'crises' (2002:255). Probes may be useful to the extent that they are designed to be unpredictable and 'irregular'. A familiar object might be used in an unfamiliar way (the listening glass) or might offer

unfamiliar qualities (once a week shampoo). These dynamics raise questions that may be helpful in identifying ways by which hair care practices might change, providing potential for sustainable design.

Expressions of the participants - returned probes cause disorder in the designer

The returned probes provided several informational insights into the participants' routines, ideas and ways of doing hair care. The probes designed to facilitate the examination of information acquisition were provided with clear instructions for the task in hand, asking the participants to record for example the steps and stages of washing their hair or to list their hair care rules.

For Participant One these rules include a number of practical and time-related actions:

> *Wear it down when its clean, wear it up when it needs washing, leave it to dry naturally in the day, use curling tongs when going out, wash hair every other day, comb through before rinsing off conditioner, use conditioning treatment once a fortnight, shave under arms every other day, shave legs if wearing a skirt, don't bother shaving legs in winter.*

For Participant Two, hair care rules gave a view more orientated towards display:

> *Wash every day, keep it nice and groomed, make sure I go out with it styled and not like a haystack!!*

The rules Participant Three mentioned stressed convenience and lack of effort:

> *Having to styling as less as possible = easy haircut, use as less products as possible due to allergy to certain soaps and shampoos and eco-freakiness, don't over style unless mad party is on.*

This probe indicated ideas about the cycles and flows of hair care ('wash everyday') and the steps and stages of practicing hair care ('comb through before rinsing off conditioner'). It revealed a number of conventions in hair care ('shave legs if wearing a skirt'), reasoning for hair care ('easy haircut uses less products'), standards of hair care ('keep it nice and groomed') and pathologies such as 'freakiness', 'natural' and 'allergy'. Comparing the three sets of rules makes visible variables that relate to the appearances of hair and practices of hair care influenced by the effort expended and perceptions of acceptability in relation to presentation inside and outside the home. Participant Three does not seem to be too concerned with hair care – the easier the better, unless there is a party, an occasion that implies ideas of a 'carnival' where no rules apply. Participant One uses a domestic/functional language to describe her hair care rules and utilizes a variety of specialised hair care tools that might signify special competence and efficiency in practicing hair care. The acceptability of the self to others underlies 'shave legs if wearing skirt' – but only these facts are provided, not justifications. In contrast, Participant Two appears to reflect on his behaviour and justifies it according to the outside world: 'I go out with it styled and not like a haystack'.

Please, write down your hair care rules.

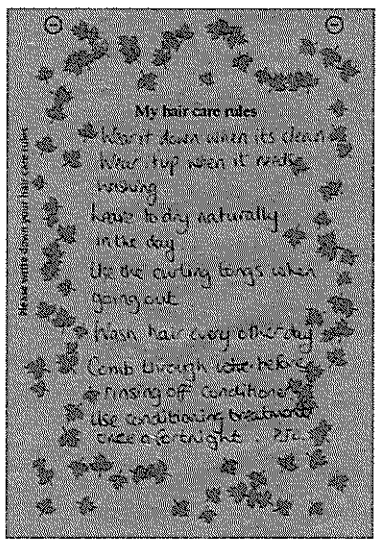


Figure 10. Probe: Example 'informational probe'

To summarise, several insights derive from the returned probes, but these provide only glimpses of the participants' hair care routines. Deeper and more systematic understanding might be gained through in-depth interviews based on real-

time interactions where the interviewer is able to prompt and clarify the context. The possibility of gaining informational 'facts' within the returned probes is somewhat frustrating in the context of this research project. As Gaver et al (2004) points out the returned probes cannot simply be translated or even less analysed. The continuous process of expression and interpretation creates a complex layer of meanings resulting in a vague and subjective picture of the participants.

Indeed, this is particularly exemplified in some cases of the returned probes within the pilot study. These caused disorder - they mystified the designer. For example, on the 'hair care products have a conversation' probe, the design of the probe was innocent, wondering how participants would react to such a 'play writing' task with fictional characters and what the themes of the dialogue would consist of. The returns of these probes were startling in that the participants were able to create a conflict between fact and reality. On the one hand the participants might have included real life information relating to the everyday interaction with hair care products, but on the other they might have had simply a bit of fun in creating a tale with characters that resemble the teapot or the playing cards in 'Alice in Wonderland'. This raises questions about the reliability and value of the tasks.

Your hairdryer, shampoo, scissors and razor are having a conversation – what would they say? Please fill in the conversation!

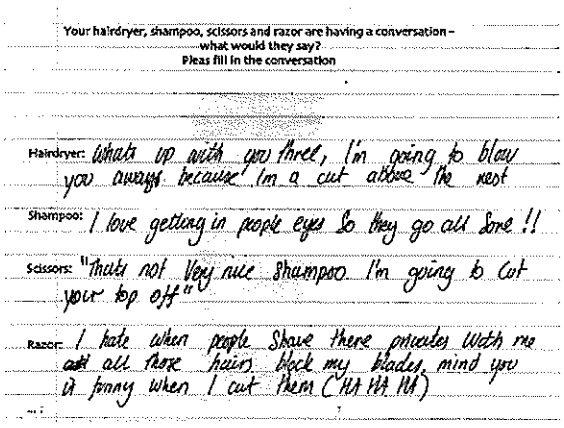


Figure 11. Probe: Example of returned probe creates disorder in the designer

However, leaving these questions and the seeming conflict aside, the probe data contained more inspirational aspects. The participants were able to humanise hair care products, demonstrating their thoughts, reflections and feelings such as 'I love getting in people's eyes so they go all sore!!' (see figure 11). The returned probes provided inspirations for thinking about possible relationships people may create with their hair care products. People might develop emotional bonds with hair care products, for example 'my razor is my friend', and having a relationship to them that is not only practical but also symbolic. As well as thinking 'my razor shaves my beard' some may also think 'my Gillette razor is a symbol of my manhood'. This combination of practical and symbolic potentials exists in many products, for example cars are practical - they get us from A to B - but they also provide a sense of identity. People develop emotional bonds with cars and they become so cherished that we modify them and call them by made up names. Hair care products might become loaded with people's personal, subjective and emotional experience in a similar way. Such propositions are beyond the subject of this paper but demonstrate how probes can sensitise the designer to private and intimate areas of life such as hair care and can inspire their creative thinking by helping them challenge accepted categorisations.

Overall, the continuous process of expression and interpretation and the potential for disorder create a complex layer of meanings resulting in a vague and subjective picture of the participants. Instead of analysing the probes, Gaver et al (2004) advocate a reading of the probes that values their ambiguity and mystery. This approach emphasises the sympathetic understanding of participants and leads to design proposals inspired by probe responses in forms of sketches and collages, paying attention even to small and bizarre things.

The process of attempting to categorise and analyse the returned probes in the pilot study generated laughter, discussion and confusion in response to wordings such as 'haystack', 'doggy style' and 'grimy', the drawings produced and stories told. The thought of coming up with design proposals seemed ambitious; however, playful re-drawings and brainstorms aided the process of creating spin-off ideas and added visualisation. The longing for electricity on tent holidays to be able to use curlers sparked off memories of Glastonbury, a three day UK outdoor concert

event famous for its rainy weather and flooding of tents, where style is important and the dampness normally creates wild curly hairstyles. This can lead to ideas of using some of the equipment of the tent to create 'controlled' curls. Instead of applying the idea of dampness and a 'thing that can be rolled into hair' to the tent holiday, it might be used to spark off ideas for the home. Slowly, design proposals have appeared that, on reflection, inspired potential ideas for sustainable hair care practices and, most significantly, sensitised the designer to the very intimate complexities of hair care.

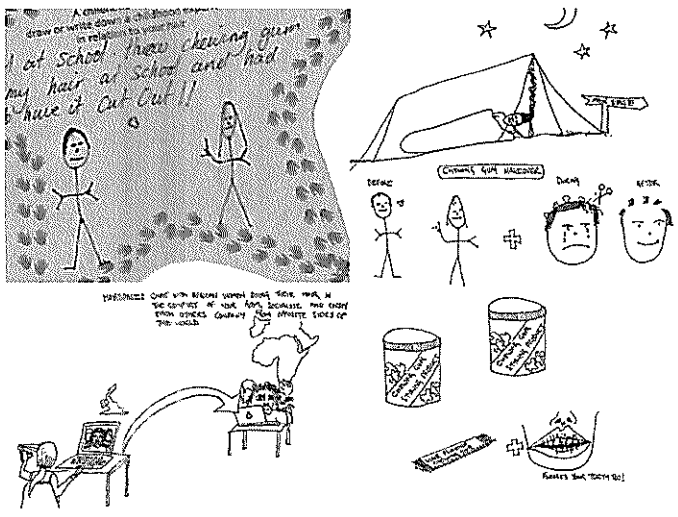


Figure 12. The first sketches arriving from the probes

Summary and conclusion

The paper has provided insights into the theory of practice and the use of cultural probes within a context of creative disorder. The authors propose that practice theory provides a useful framework to develop a multi-relational understanding of the complexities of everyday routines. More significantly, practice theory allows room for practice change through 'crises of everyday routines', indicating a potential to use the theory in examinations into sustainable design that are concerned with the product use phase, everyday behaviour and routines.

The paper has considered the notion of disorder that is potentially created by the design-led method of probes as an aid when reflecting on the probes process in numerous ways. Firstly, the designer's drawings or graphics within the probe intentionally disorder the participant's routinised thinking about hair care. Secondly, the participant's response to the probe is also disorderly in that their activity can't be predicted or controlled. The probe interferes with the lived experience of the participant's routines, ideas and conventions, which could provide starting points for changes in practice. Finally, the returned probe may create disorder in the design researcher's assumptions about the subject an in the process sensitise the designer to the complexities of everyday behaviour in ways that may raise unforeseen questions and even open up opportunities for sustainable design.

The authors do not advocate separating these elements of disorder when applying the probes, as they overlap. The differences can be valuable in facilitating and thinking about the process of developing and applying the probes and may be even when using the returned probes as inspirations.

The paper builds on the first author's PhD programme that is in the pilot study stage. Indications for sustainable design and evidence for the significance of practice theory will be explored as part of the wider research study and was not the intention of this paper. This research seeks to develop novel strategies for sustainable design by exploring a multi-relational understanding of the practice of hair care. The research will explore approaches to sustainable design that uses design-led methods not to gain factual information (for which other methods such as interviews seemed more appropriate) but to inspire and sensitise the designer when thinking about hair care and sustainable design. Indeed, it aims not only to inspire the designer but also to be challenged by participants to identify opportunities for changed practices.

While some designers tried to keep faithful to the craft ideal like Henry van de Velde, others tried to reconcile industrialization with the qualities of good design and saw the effects of mechanization as an opportunity to create better standards of living for the masses like Hermann Muthesius, the main figure behind the foundation of the Deutsche Werkbund and later the founders and followers of the Bauhaus school.

In the 1930s and 1940s, similar to Europe, American industrial designers were also considering social responsibility. As Whiteley (1993) states: *"The first generation of American industrial designers such as Norman Bel Geddes, Henry Dreyfuss, Walter Dorwin Teague and Raymond Loewy often sought to justify their activities in terms of creating a better world by making products more efficient, easier to operate and more (in today's language) 'user-friendly'".* Their work however became the symbols of the mass production and consumption ethos of the capitalist development.

A radical critique of the practice of design came from Victor Papanek, an Austrian born designer based in the US. The majority of his work criticizes consumerism and obsolescence. In his best known book, *Design for the Real World (1971)*, Papanek's main argument is that designers are harmful regarding their present function but that they can make a difference by using design to solve the "real" problems faced by human populations (Papanek, 1971; 1984). Papanek worked to make design accessible for the Third World by designing low tech products. Following *Design for the Real World, The Green Imperative* served to elevate green design in professional practice (Margolin, 2003).

In the 1980s when Papanek had written his influential book *Design for the Real World*, International Council of the Society of Industrial Designers (ICSID) chose "Design, Society and the Future" as the theme of its sixth Conference. Designers and planners addressed many issues about the trauma of the industrial society in this conference.

Also, in the mid 1980s environmental problems have been widely recognized by scientists and intellectuals. Social concerns and environmental issues were conceptualized and were introduced to public. As a response to this, the concepts of green design, eco-design and bio-design emerged. The increased awareness of the social and environmental problems of the World thanks to the works and activism of individuals such as Ralph Nader or organizations such as Greenpeace and the Friends of the Earth helped in the appearance of ethical consumption preferences and habits. The severity of the dangers that the World is faced with, has led many people in the advanced countries including the design thinkers to work with alternative concepts and business models.

Contemporary Examples of Alternative Movements for Social Responsibility in Design: PSS, Hacking, Parasitism

Product Service Systems (PSS) is one of these concepts. The Product-Service Systems (PSS) concept promoting a shift in the focus from selling just products to selling the utility, through a mix of products and services, has been embraced by design thinkers and educators in the developed countries and became subjects of individual courses in design schools. Sharing the life-cycle thinking promoted by the United Nations Environment Programme and the ideal of reaching sustainable production and consumption, the PSS concept was followed by the slow design and solution oriented partnership concepts (Manzini, Vezzoli and Clark, 2001; Manzini, Collina and Evans, 2004; Fuad-Luke, 2006).

The social impact of design has also been an issue for Massive Change founded by Bruce Mau and the Institute without Boundaries. Massive Change explores paradigm-shifting events, ideas, and people, investigating the capacities and ethical dilemmas of design in manufacturing, transportation, urbanism, warfare, health, living, energy, markets, materials, media and information. The outcomes of this exploration take a variety of forms: A traveling exhibition, a book, a series of formal and informal public events, a radio program, an online forum and a blog (Leonard and Mau, 2004).

The possibilities offered by the internet and the overall advancement of the communication technologies brought new and critical practices of design.

At this point it is important to mention the transfer of some concepts such as parasitism, hacking, hijacking and do-it-yourself to design. Hacking, developed as a concept developed in the virtual world, embodies taking over the means of running

a process and using it for another purpose. Having borrowed this idea, several design initiatives have been hacking fashion shows, production lines, design stores, etc.

As an example of hacking in design, six Norwegian designers came together in a three days workshop to hack a shoe factory called Dale Sko in Norway in April 2006 and the outcome appeared in the London Fashion Week 2006. The aim of this project was to take over the production line to question the post industrial situation in mass production where there is no room for spontaneity, co-operation, involvement of crafts and happy accidents. According to the co-organiser of the project Otto von Busch this project breaks the determined line of a system to make room for creativity, authorship and flexibility:

"Using the metaphor of hacking the workshop was aspiring to widen the understanding on how to change the way systems work, not submitting to the fixed machine configuration of production but instead bending and modulating it into a better fitting form. That is to creatively tinker and manipulate the flows and collection of functions between the design and materialization processes and open them for collaborative interventions, but also to reclaim authorship and breaking the pre-programmed intentions of a system. In the analogue practice of shoe hacking this technique conducted experiments with the software production instead of altered the machine hardware in the factory, instead challenged technical innovation through operational misuse (Von Busch, 2006).

Initiated by Rudiger Schloemer, the characteristics of parasitism were borrowed by Additional to create parasitic textiles to subvert by design. According to the Encyclopedia Britannica parasitism is the relationship between two species of plants or animals in which one benefits at the expense of the other, without kiling it. Similarly, in this project Additional an independent red seam lives on other surfaces and adds new layers of meaning about authorship, brands and mass production (Figure 1). Designers of Additional hold workshops and hack fashion shows to spread the idea of Additional and parasitism. Besides, a cookbook is available via the internet to teach people how to hack clothes the Additonal style (www.additional02.net).

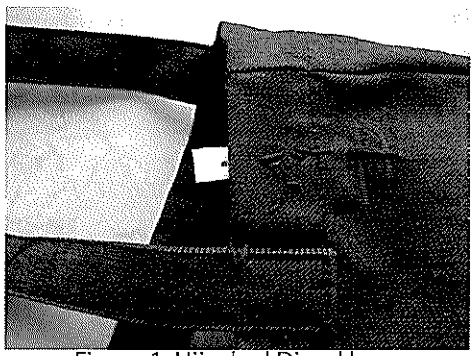


Figure 1. Hijacked Diesel logo

Berlin based designer Zoe Sheehan duplicates mass produced items from Wal-Mart by hand and takes them back to the store to sell them for the same price. The original tags and labels are moved to the copy. The copy is replaced in the store and waits to be bought whereas the original Wal-Mart piece is exhibited in a gallery and is sold as an art piece. With this project, although not having a business dimension, Sheehan asks questions about the capitalistic understanding of mass production and its value as a ready-made in the world of creativity. The socio-economical aspects of hand craftsmanship, mass production and marketing are brought into question with her artistic intervention (www.zoesheehan.com).

San Francisco based collaborative called Counterfeit Crochet borrows forms from designer items of established brands and copies them with knitting; again to ask the above questions of linear, mass production and moreover to state the possibility that you can make a designer item on your own (Figure 2) (www.stephaniesyjuco.com).

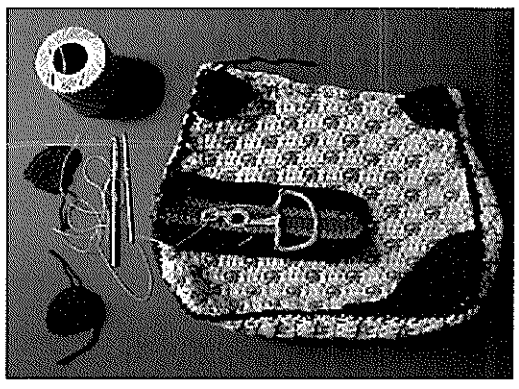


Figure 2. A Gucci bag reproduced by crochet

New York based Cat Mazza choses to use the internet for her microRevolt projects. One of her tools knitPro translates digital input to knit, crochet, needlepoint and cross stitch patterns. When an image is uploaded, knitPro translates it into fabric to subvert "*corporate hegemony*" (www.microrevolt.org).

Hacking couture is a workshop based by Giana Gonzales from Panama. During the workshops participants research and evaluate certain codes and characteristics of major fashion designers like Chanel, Ralph Lauren, Yves Saint Laurent. These codes are then used in re-making workshops to build clothes with the analysed designers' visual language. The post-production is presented to public as open source for codes to be commonly used (http://www.hacking-couture.com/).

These projects address the post-industrial symptoms of the meaning and the role of design both in the market system and in the society. The essential aspect of these projects are that they require almost no investment to be realized. Most of them are lead by individuals and most of them are side activities done in the left over time of professional practice. Having a hand-made and home-made quality, they foster possibilities to intervene for all of us.

One of the first critical design collectives Droog Design's product designers respond to social issues. The Netherlands based Droog Design have been working on design for emergency, cooperation with local manufacturers and questions like what makes consumers chose a product, what determines the price of a product, can objects influence social behavior, how can users make a personal mark on products. One of the Droog projects that has focused on re-use, memory and how to intervene in a product's life cycle is their collaboration with Franck Bragigand (Figure 3). In this project, called *Restoring Daily Life*, Bragigand painted the objects that visitors brought to give them a new life. Another product: *Anapurna* commissioned by Italian door handle manufacturer Valli&Valli was developed by Ronald Rewelissa with the intention of reducing parts in laser cutting (Figure 4 and 5). Held in 2005 Milan and developed by Niels Vam Eijk and Miriam Van der Lubbe, *Value for Money* is an installation that asks visitors the following questions: What determines the price of a product? The amount of raw material? The value of the material? Production time? Labor costs? Edition? Uniqueness? The name and reputation of the designer or the brand? (www.droogdesign.nl).

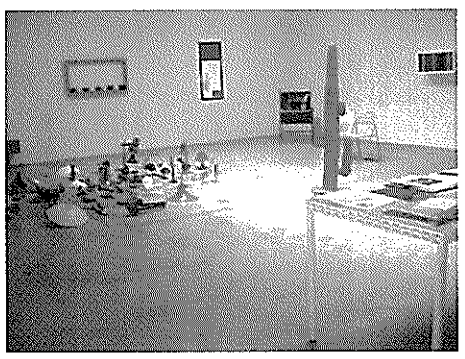


Figure 3. Franck Bragigand's work

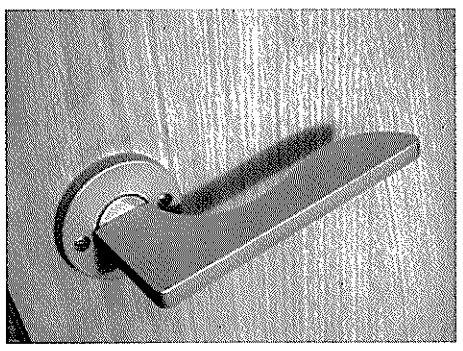


Figure 4. *Anapurna*

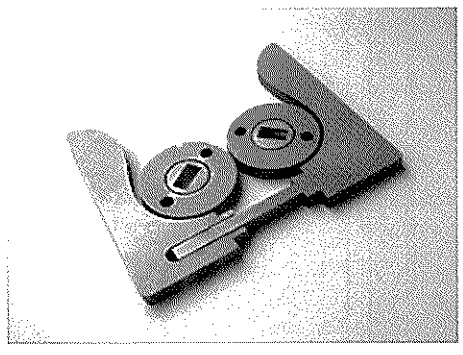


Figure 5. the minimization for laser cutting

The influence of Droog Design spread to design practitioners and design educators and was enriched by other designers who subvert product design such as Dunne&Raby, Marti Guixe, Krzystof Wodicko, Michael Rakowitz, Lucy Orta and Front Design. According to the founders of Dunne & Raby; Anthony

and Fiona: *"Dunne & Raby use products and services as a medium to stimulate discussion and debate amongst designers, industry and the public about the social, cultural and ethical implications of emerging technologies. Many of their projects are collaborative, working with industrial research labs, academia and cultural institutions to design both speculative products and services."*

Placebo, one of their projects is a conceptual experiment to explore people's interactions with electromagnetism. A Placebo product Electro-draught Excluder, made out of conductive foam provides an electromagnetic free space to create a comfort zone (Figure 6) (www.dunneandraby.co.uk).

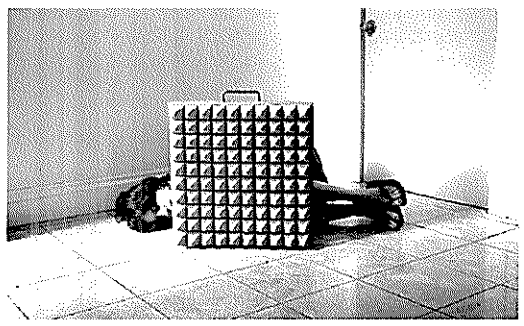


Figure 6. Electro-draught Excluder

For Design Tide 2006, Front Design a Swedish design collective chose the world's most commonly used plastic chair to intervene. The anonymously designed -2 Euro- white plastic chair was re-interpreted by Front by transforming it to an exquisite armchair by adding a leather cushion (Figure 7) (www.frontdesign.se).

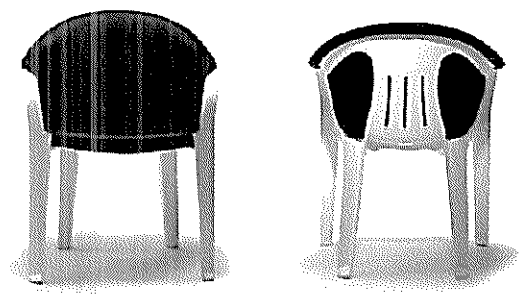


Figure 7. leather and plastic Front chair

In the crochet bags, Front's armchair, Dunne&Raby's Electro-draught Excluder it is noticed that democratizing innovation demands an amateur spirit rather than the sleekness of professionalism. Thus, designers find room to express themselves in the looseness of amateurship. In the above examples one of the advancements that liberated both the designers and the customers was technological plurality. With the help of technological plurality information started to be distributed rapidly; providing access to the majority of people. Technological plurality broke the cartels in various areas.

Besides the interventions mentioned above, the design practice has been sensitive to theoretical suggestions of design thinkers. Some concepts suggested by Manzini in 2006 have the potential to create great impact for designers who want to follow alternative paths for better well-being.

For social innovation in design, Manzini's suggestion for joining creative communities and collaborative networks is an applicable model. According to Manzini social innovation emerges from new behaviors, new forms of organization and new ways of living as in the simplistically transformative way of thinking in Front's armchair. Thus, a new way of thinking is essential beyond all other necessary investments. This approach suggests people to reconsider their lives, their society, and their work from a different perspective not to build new forms from scratch but to re-organize the existing patterns for more sustainable results. This is the basic idea in the formation of creative communities (Manzini, 2006). Building creative communities requires smart planning instead of economical power. For this reason, this model is socially and economically appropriate to developing countries where people already have adopted to think in a way of making an economy of materials, goods and food. Manzini defines creative communities as: *"groups of innovative citizens organizing themselves to solve a problem or to open a new possibility, and doing so as a positive step in the social learning process towards social and environmental sustainability" (Manzini, 2006).*

Besides creative communities building collaborative networks is another opportunity that designers can use extensively. For instance, open source movement creates a base for everybody to contribute and share free from geography or country.

As in the example of *Additional* many designers and design groups use the opportunities of the internet to spread the

alternative approaches of design as much as possible to create a social impact. Internet has not only brought the means to publish cookbooks so that users can learn how to do things themselves but also houses the opportunities of the open source movement.

Open source movement has enabled to create a common knowledge source like Wikipedia and new platforms for people to get together to share design knowledge that can be necessary to start alternative paths of doing things.

Challenging the copyright system leads several different end products to be developed based on the primary input. Designers use the internet as a base of sharing via developing softwares for designers. These free softwares are primarily used as vehicles for visualization such as drawing, modelling and animating. The variety of such alternative open source programs enable designers to break the linear mode of professional practice bound to major professional softwares.

Besides, the open source movement has encouraged designers to share the result of their projects. For instance, although not using the open source on the run, Cameron Sinclair contributes to the open source movement by opening the designs he gets done for the countries in need to public.

Finally, one of the latest concepts in socially responsible design is the idea of being distributed. The development of the idea of being distributed has been implemented in design for sustainable development. According to Manzini (2006) *"the term distributed adds to substantive to which it is related, is the idea that it has to be considered as a web of interconnectedness, autonomous elements, i.e. elements that are capable to operate autonomously, being, at the same time, highly connected with the other elements of the system."*

Being distributed enables partners to function independently yet in an interconnected manner. The dispersed partners can be anywhere. Thus, it supports the local development by accepting local production as part of a bigger network (Manzini 2006).

Up to this point, we tried to make a brief review of the ideas and the movements that were developed or followed by the designers or design educators in the advanced countries.

These lines of thinking or movements have been followed with interest and looked upon by the design circles situated in the developing countries. However, these countries are usually not the source of them or they are not fully embraced by designers or design education in these countries. An exception to this may be cited as the Indian case. Having a vast population, Indian designers or design educators developed ideas dealing with their needs and problems specifically.

'Design for Development' Conference organized jointly by ICSID and UNIDO in 1979 at the National Institute of Design in Ahmedabad, India constituted an historical platform for Indian designers or thinkers to share their ideas with prominent designers of the World at that time.

Romesh Thapar, a keynote speaker at this Conference stated that: "To raise so many (people) to recognized levels of healthy and creative living poses problems which have no parallels in lands which have already developed and advanced. The design needs of "development" and affluence are different. The Indian designer cannot afford to be fanciful, sensational, 'expressive' or indulge in art for art's sake. He cannot, through his design, overspend scarce materials and money. Unlike many industrialized countries, the investment in India should be considered in terms of the unskilled many and not money... The India of today cannot be a "few-decades-ago" Italy. Today's global concerns of environment, energy crisis, pollution, the desired life of a product, side effects during its life and effects after its life, should be equally important considerations for the Indian designer as they are for his counterpart in any industrialized country" (quoted in Balaram, 1998).

In line with the views of Thapar, Balaram (1998) also mentioned the need for the Indian product designer to understand and base his designs in his own context while at the same time looking at and taking inspiration from design developments all over the world.

Balaram's proposal for designers as to turn to service design rather than concentrating on consumption oriented objects and to design strategies are very much in line with the sustainable design and the latest thinking developed in the field of design management. According to Balaram "the designers of today should offer creative solutions to problems

on a variety of issues rather than create more and more varieties of objects. Design would then become a mission instead of what it is today- a commission".

The experience of Turkey on the other hand differs from the Indian case in the sense that neither the Turkish design education nor the Turkish designers were forthcoming with original approaches addressing specifically the needs of the local people or the industry.

This observation constituted the starting point for our paper. In the following section we will put forward our ideas for the reasons of this observation on the Turkish situation.

The Turkish Situation: The Reasons for the Mental Barrier

Although there are some recent examples of original thinking developed in the Turkish context on the questions of how design can contribute to the Turkish industry and industrial regeneration and what the nature of the design management education should be with a local and global appeal (Er and Er, H.A., 1999; Er and Er, H. A., 2003; Er, H. A., 2004; Er, 2005; Yasak, 2006), the Turkish design scene has not been a productive one in terms of developing novel ideas specifically addressing the local needs. Below, we will mention some possible reasons for this situation.

Like most of the developing countries, Turkey started her industrialization process on the basis of imported technologies. Like the technologies, design education was also imported as part of a "modernist development paradigm" (Bonsiepe, 1991; Er, 1994). As stated elsewhere (Er, 1991; Er, H. A., 1994; Er and Er, H. A., 2006), "long before the new product design needs of the Turkish industry materialized, industrial design schools had been planned in order to meet the future demand which was expected to emerge as a result of the import substituting industrialization strategies implemented in Turkey in the 60s and 70s".

Latecomer industrialization, a process that Turkey has gone through as well, based on learning rather than invention or innovation (Amsden, 1989), is sequential in nature aiming finally at catching up with the industrialized countries.

A successful indigenous learning sequence is defined as *"one that enables a firm (or an industry) to create and develop a complete set of 'in-house' engineering skills - that is product design skills, process engineering capabilities, and production planning and organizational skills - so as to be able to compete on its own both in domestic and in international markets"* (Katz, 1985 in N. Rosenberg and C. Frischtak ed., 1985 quoted in Er, Ö., 1995).

While Latin American countries, Turkey and India tried going through this sequential process of development by trying to develop their local industries behind protective barriers, other developing countries or city states such as South Korea, Taiwan, Hong Kong and Singapore implemented export oriented industrialization policies (Er, 1994; Er, Ö., 1995).

The process of gradual development although inevitable for acquiring product development capabilities also brought a mentality to the people who live in developing countries that they have to bear the same consequences in terms of social, economic and environmental problems with the advanced nations and they can't deal with them in the same manner with such countries unless they come to the same development level.

The catching up mentality and the ethos of modernization meant that the craft based production; "the traditional means of production" were seen as inferior or simply ignored by the design education. As the design education was imported like the technology itself, its links with the local reality remained weak. The imported model of industrial design education with the expectation that through the process of gradual development, the Turkish industry would need human resources able to come up with original design concepts, has kept graduating industrial designers waiting for the industry to make use of their expertise in the way they do it in the advanced countries. The delay in the materialization of this expectation caused disappointment and a search for alternative design careers mostly in the area of interior decoration and graphic design.

The constant feeling of lagging behind together with the effects of an unsophisticated consumer culture due to the low income level of the majority of the people and limited product offerings became a mental barrier for the designers to create solutions or business models dealing with the local needs and conditions.

The fact that industrial designers have reached a critical mass in Turkey and that they are much more connected to the World either through the possibilities offered by the internet or by taking part in international networks of production, this mental barrier seems to be weakening. Already, there are signs of the Turkish design education or designers building links with the local dynamics either in the cultural or industrial scene.

The web portal Dexigner started by a young design graduate in Turkey has built itself as a bilingual platform to have both a local and global appeal. Through its Turkish and English newsletters and discussion forums it provides a platform of knowledge sharing among the Turkish design community and also between the Turkish and the international design communities. Another design portal Designophy tries to build a knowledge base for the Turkish design community. With the possibilities offered by the internet, it creates this knowledge base by making use not only the know-how of the local experts but also the leading figures of design all over the World.

A project focusing on the regeneration of a local industrial district with the help of design is Made in Şishane, coordinated by Aslı Kıyak Ingin. Şishane of Istanbul, being famous for its small lighting manufacturing workshops, was a district in need of redefining itself to keep its existence in the face of rough competition from China. Ingin brought designers, architects and artists together and matched them with the lighting manufacturers of the district to redefine the local manufacturing base by design and maintain a sustainable future for it (Yasak, 2006).

The Design for SMEs project inititated by the Department of Industrial Product Design at ITU in collaboration with the Istanbul Chamber of Industry is another example of design education tailoring itself to the particular needs of the Turkish industry (Er and Er, 2003). The project has been implemented successfully since 2003.

Another such example came from Izmir University of Economics as for the first time a Turkish design school organized a scientific conference focusing on a theme valid in its geographical context namely design for agricultural industries with a particular focus on wine and olive oil (Izmir, 2005).

These examples are enough to show that the design community in Turkey tries to break through with the mental barrier created by the particular industrialization and the accompanying modernization process that the country has gone through. This mental barrier involves the feeling of being late, sometimes inadequate too. The hyper modernist idea that developing countries should first catch the advanced ones has made many designers' thinking limited to traditional models of development.

The above discussions suggest examples of alternative design models, mainly in developed countries and starting slowly in developing countries. Relying on these, it can be suggested the depending on the advancement of communication technologies, the internet and the open source movement, designers can create alternative ways of existence genuine to their roots if they can overcome the mental barrier.

Let us finish with a quote from Balaram:

"First of all, a country must define for itself, development related to its own needs: socioeconomic, political, cultural, and appropriate to its resource. This will decide the articulation of the type of policies for design or those having a bearing on design. Imitating the successful policies of others may be easy but in the long run may be wasteful and harmful... It must be realized that development is not "catching up with yestarday's West or East". It is developing one's own capabilities to the maximum. Not only that, true development is to realize one's best and to use it to become a pace-setter in some areas, to stand with dignity in a competitive world" (Balaram, 1998).

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HARNESSING DISORDER AND DISASTER IN RESPONSIVE NARRATIVE SYSTEMS

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Abstract:

Harnessing Disorder and Disaster in Responsive Narrative Systems.

The premise of this paper is that the culturally negative attributes of disorder and disaster have purposes when designing interactive/responsive narratives – indeed even a positive role in realising the intended design outcomes. The scope of practice and theory covered in this paper explores:

- the visual opposed to textual,
- screen-based opposed to physical,
- responsive opposed to linear.

An intrinsic part of non-linear or multi-linear, layered and open-ended systems is the presence of disorder. This is normally structural and is companioned by a struggle in terms of achieving cognitive immersion. Primarily citing doctoral practice, the paper discusses an aesthetic, and details a conceptual treatment that uses duality, dissonance, disorder and disaster in an affirmative manner.

1 Introduction

Post 1960s, our mainstream cultural understanding has been that disorder is bad. It comes hand in hand with the notion of hierarchy and implied order as being good. At a basic level, to create disorder is to be dissident, and deviant from the normal. In today's landscape, being dissident is problematic and often linked with acts of terrorism. Being dissident has not always been so contentious -- there is an interesting and important history of protest movements giving birth to Anti-imperialism, Socialism, Civil Rights, Feminism, to name but a few. In terms of this paper, digital literary interactivity belongs (at least in terms of its origins) to the loosely categorised movement that represented the anti-hierarchical late 1960s and 70s. It is most prominently illustrated in the politic of video art, performance and happenings, where the audience were invited to become participants in art events rather than passive receivers of a generalised or mass communication (such as in film or pulp books). The artist/author/designer lost her fixed control over what would happen and the participant gained more prominence in the events.

The paradigm of clear hierarchy, articulation and concrete outcomes is the prevailing hegemony in responding to most design problems. However, within responsive narrative systems (also known as digital literature) such a mode is proven to be problematic, as one of the defining characteristics of the medium is in resisting unified, all-encompassing, and universally valid explanations. Within responsive non-linear artworks, the participant uses primarily perceptual and explorative actions: looking, listening, selecting and interpreting often simultaneously. These multiple types of communication exchanges are unusual (Aarseth 1997: 64), because perceptual *and* interpretive functions are married with extensive explorative interactions. Understanding signs in an interactive environment demands more perception and more commitment, as the structure and rules of behaviour tend not to be standardized or taught to us at a young age. Part of the author's doctoral practice as discussed within this paper (hitherto called *Deviant*[1]) explores physical (onscreen

[1] Possession of Christian Shaw [Online]. Glasgow School of Art. Available from: http://www.6amhoover.com/xxx/
[Accessed March 2007]

point and click) as well as mental interaction, visual rather than textual signs (as a way to free up more of our cognitive energy to perceive the rules) and amongst others -- questions both the presence of disorder and how the *threat* of disaster acts as a stressor in creating this desirable heightened state of awareness. This is intended to enable viewers to have a meaningful discourse with the expression and become active participants in new modes of exchange and new, unusual and participant-led methods of reading.

Given the multiple permutations, non-linear structures that attempt to attain an explicit articulation or outcome would misalign themselves with existing traditional media. This often results in ersatz rather than appropriately mediated experiences. Such media, which do facsimile existing models, often exude a lack of self-belief. This paper will specifically deal with responsive, visual and narrative artworks whereby the dominant model could be said to be the printed book - as typified by the Bible. Culturally, at least in the West, the printed book is linear, containing orthodox rules and reading procedures such as: formulating the text letter by letter, word by word, left to right, top to bottom. Structurally, the conclusion is found at the back and not midway or at the front and so on. Traditionally the whole premise of the book is to minimize disorder. In contrast, responsive narrative artworks tend to employ non-linear structures, self-reflexivity, cyclical loops and deliberately play with participants' expectancies.

Within *Deviant* an interactive environment, disaster, disorder and their by-product dissonance were fundamental features in the communication of the project. How these aspects function and their importance in terms of its objectives will be detailed in the following sections with reference to how the aesthetic sits within the broader discipline of interaction design. The end sections will go on to discuss how this model of dissonant communication can be harnessed into a positive and what qualities responsive narrative design as an emergent discipline can offer further design specialisms.

2 An overview of Interaction Design

Interactivity is one of the defining characteristics of new media and arguably one that keeps the 'new' alive in the noun, the others being the fusion and remixing of previous media types, freedom in the distribution mechanisms and opportunities for data visualisation[2]. In terms of design it should be recognised that the modes of interactivity available are numerous and that the type(s) deployed are as important as the visual aesthetic or content to be delivered. The mode of interaction can significantly impact on the participants' emotional involvement. More primacy is needed when we as designers conceive of the value of the participants' experience. This is supported by Michael Nitsche who argued that applying the cinematic three-act structure (from Aristotle) would simply suggest "[the] interactive narrative is the product of gluing together a narrative structure with an interactive method". Instead he proposed that the three-act structures can be projected onto the user's experience, that "his/her experience as the plot" (1998: 69-73).

As a discipline, digital narrative design arguably originated in 1952 with Christopher Strachey's *Love Letter* generator for the Manchester Mark 1 computer (Wardrip-Fruin 2005) and as such has yet to reach maturity in terms of best practice. The reader, filmgoer, theatre or radio audience has always mentally 'interacted' with the text (i.e. the message). Within the digital realm the reader/audience often corporally interacts with the message – that is, they actively change the body e.g. looks, sequence or content of the text. This active element is the opposite to the low level mental interactions of watching a formulaic film. In interactive artworks the participant is always aware of her decision-making. Interactivity is not just the space between a click and arriving somewhere else. It's about what happens mentally in-between for example: anxiety, fear, surprise, apathy or confusion?

Models of Experience

* By far the most dominant style of online interaction is *Transactional*: literally buying or selecting access to information or products. In this model very little

[2] Data visualisation examples available from:
Fry, Ben http://benfry.com/ [Accessed March 2007]
Galloway, Alex /RSG collective http://r-s-g.org/carnivore/ [Accessed March 2007]
Jevbratt, Lisa. http://jevbratt.com/ [Accessed March 2007]

interpreting is required, the interface must be clear and intuitive to facilitate an easy purchase or exchange.
(see http://www.amazon.com)

* Transactional, is seconded by what the author terms the *Gaming* model: where the interactivity is orientated towards propping up the win or lose axiom. Through persistent and detailed interaction the participant is rewarded by gaining access or witnessing the goal or occasionally even more explicitly -- given a 'mark.
(see http://www.trevorvanmeter.com/flyguy)

The following are more unorthodox and lesser-seen modes:

* *Consequential*: this model is little used outside the Gaming mode and is normally subservient to the 'ultimate goal'. Consequential interactions are set-up to incite emotion from the participant; often orientated around: Do we care about the character? Can we make their situation better? Are we by our choices to blame for some event? Consequential interactions are often narrative, utilising mystery and drama.
(see: *Kosovo Elf* http://www.futurefarmers.com)

* *Explorative*: where the interaction is more open-ended than the Gaming mode and often is without a clear goal or is goalless and which may contain surprises. In this type of work the participant must bring motivation and normally their own interpretations (unless its an abstract environment). Explorative is normally much more reflective than the Gaming model.
(see: http://www.vectorpark.com)

* *Kinetic*: whereby the experience of interaction is much more immediate and situational -- the simple joy of seeing normally an audio-visual response to the participants onscreen touch. Kinetic interaction is primarily about participation and empowerment (the participant is the driver as much as the designer). Often there are no concrete results or outcomes – it's about the participant feels in the moment of interacting.
(see: http://showstudio.com/projects/031/031_interactive.html)

* Linked to Kinetic due to its emphasis on touch and response but worthy of its own category, is *Quasi-Corporeal* interaction which offers or refers to a virtual human-to-human (or computer) tactility. When onscreen interactivity mimics, intensifies or refers to our 'real' senses.
(see: http://www.entropy8zuper.org/skinonskinonskin/)

* *Creative* interactions offer up new visual combinations, remix or distort existing content. It can be about enjoyment (like Kinetic) and perception – looking at things in a new way. It also covers work that allows the participant to be authorially creative for example: personalise a character applications; add text to a narrative. Creative interactions are about giving at least equal if not more power to the participator.
(see: http://www.impermanenceagent.com/agent/)

* *Destructive*: the primary ideological assumption about technology is that it should work. The term interactivity presupposes a fait accompli -- that links and connections will be successfully made. Faulty or actively destructive interaction sits alongside the notion of the 'post-digital'[3], which refers to works that rejects the hype of the digital revolution. Where purity, pristine sound/images and perfect copies are abandoned in favour of errors, glitches and artefacts that become not whole but decayed. Destructive interaction is the polar opposite to the Transactional mode where confusion and de-powerment of the participant is given primacy .
(see: http://404.jodi.org and
http://www.requiemforadream.com)

* And of course *Hybrid* mixes, where interactivity is essentially eclectic, a mix of the above.

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[3] Post-digital (Cascone 2000) is often linked with the Post-conceptual which refers to work where there is no distinction between works of self-expression and works of social critique e.g. they are part and parcel of the same activity and they stand alone. Post-conceptual is associated with the anti-theory turn in art production of the mid to late 1990s. This paradigm abandons much of post-modernism's practices e.g. of re-use, appropriation, media-critique, re-presentation, cut-up, "deconstruction".

3 Introduction to *Deviant* a Hybrid model

Deviant (Figure 1) is a hybrid (Consequential and Explorative) artwork that deals with life amid the ruins of history and meaning. It alludes to a Scottish witch-trial narrative from the Early Modern period, which is generally unknown outside the academe.[4] As a piece of research it articulates a particular type of dissonant experience for the participant. It also questions and explores duality -- the tension between what is expected and what is offered. In particular, it subverts the conventions of cybertext and hypertext fiction; has no back buttons or easy re-readings; and deliberately lacks the expected Gaming goal orientated 'making a difference' tasks. *Deviant* is presented in a visual and almost entirely non-textual way, although the piece has a textual basis. Its narrative premise uses post-modernist notions such as ambiguity and fragmentation and its defamiliarising or confrontational aspects can easily be felt. Unlike most responsive artworks,[5] the project meaningfully cuts off possibilities. The project communicates in a significantly unconventional manner and as such the narrative content may often be hidden, at least initially. Thus the combined impression of the artwork is decidedly 'other'.[6]

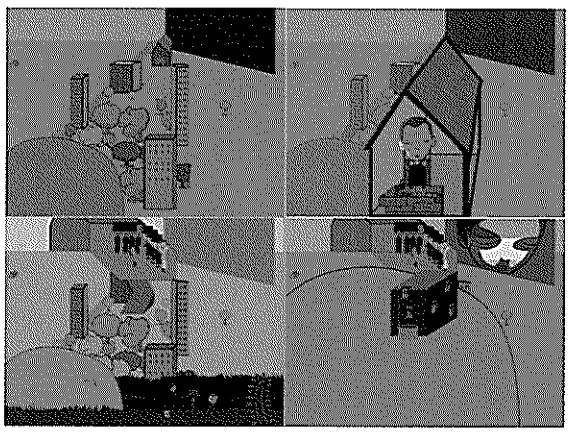


Figure 1. Select screen grabs from Deviant: The Possession of Christian Shaw (Leishman 2004)

A treatment of Disorder

Some disorder is inevitable within responsive narrative artworks if non-linear structures are present -and then, depending on the treatment of the conclusion, i.e., classic dénouement, looping (no end), open-ended or un-conclusive-disorder can be said to be a key feature in the media characteristic. *Deviant* sutures a total disjuncture between narrative immediacy, and the fractures caused by non-linear paths and a confrontational aesthetic, by employing a narrative skeleton -- this is an essentially linear supportive base that creates a type of narrative coherency that still allows for multiplicity of sequence and some ambiguity. Outside this

[4] Base Narrative:
In the year 1696, the 11 year old daughter of John Shaw, the Laird of Balgarran, fell victim to one of the most notable cases of 'demonic possession' in Scottish History. It resulted in a large number of locals being implicated as her tormentors, concluding with three men and three women being put to death on Paisley's Gallow Green on the 10th of June 1697. Through the passing years, and as society became more skeptical and atheist about the likes of witches and demons, the character of Christian has come under close scrutiny, in particular the possible motivations that drove her actions and caused her 'condition'. Recently, using a feminist angle, scholars have investigated the first-hand documentation of the case (McLachlan & Swales 2002). They uncovered a decisive fact that these original documents were written by an anonymous author. To cast further aspersions on the truth of these historical artefacts -- the documents contained many striking resemblances, in tone, and language, to the more famous Salem witchcraft outbreak in New England in 1692 just 4 years earlier (Rosenthal 1993). With such capricious origins and being recently placed in the hinterland of 'true' history the text was ideal for mapping onto a multi-linear structure and exploring hybridism.

[5] Examples where the interaction is interwoven or 'open' enabling the participant to revisit either intentionally or randomly previously visited areas available from: Fisher, Caitlin, (2001) These Waves of Girls. http://www.yorku.ca/caitlin/waves/ [Accessed March 2007]
Jugovic, Alexandria & Schmitt, Florian, Requiem For A Dream. http://www.requiemforadream.com [Accessed March 2007]
Smith, Patrick. Vector Park http://www.vectorpark.com [Accessed March 2007]

[6] 'Other' opposed the 'same'. Emmanuel Levinas's Totality and Infinity: An Essay on Exteriority (1969) describes how subjectivity arises from the idea of infinity, and how infinity is produced in the relationship of the self with the other. Also see Sartre l'Être et le néant (Being and Nothingness) (1943).

narrative skeleton, the narrative in the practice has lost its authority, requiring significant attempts at interpretation from the participant. Narrative flow became a narrative emulsion, a low-charged visual lyricism rather than a traditional narrative. This, combined with the sonorous elements, created an atmosphere of dissonance: a sense of disorder in the world.

The participant's experience of the project does not initially reveal the plot. First is an accumulative experience of atmosphere. Dissonance strikes, but after awhile, although coming from a position of ignorance, the participant absorbs the available narrative content and also actively explores the world, and continuously searches for the hidden.

Secondly, and towards the end of their first reading, participants cognitively construct the information they have experienced in a process similar to Murray's understanding of 'immersion'[7] (1997:181); at this stage they may or may not begin to form an interpretation - create a conceptual order.

Thirdly, once they have reached the epilogue text, and if they re-enter the project, a further round of atmospheric accumulation occurs, fuelled by a better awareness of what is being witnessed.

This is unlike experiencing most other narrative forms. For example, structurally, the participant's experience of the project does not work like games, which often use the model of increasing the difficulty of the participants' tasks as they move through its structure. Nor does it use the conventional beginning, middle and end. Instead, in *Deviant* the participants are required to re-enter the project (preferably multiple times) to gain their own sense of conclusion or a Meta ordering. It is hoped that the feeling of incompleteness fosters an urge to retrace their steps, traverse the narrative again - a common stumbling block in responsive artworks.

The first, second and third steps are repeated until the participant has perceived all the narrative information and is atmospherically replete. At this participant-specific point, they may have achieved 'order' within their understanding of the project or not (they may formalize a different and still valid interpretation).

The threat of Disaster

Disaster as a phenomenon ensures that society has a right to fear it. Various texts through the ages serve to remind us of the cultural impact of the (natural) disaster, such as the Atlantis myth from Plato in *The Critias* and *The Timaeus* (cited by Benjamin 1871), the Great Fire of London from *The Diary of Samuel Pepys* (Pepys 1659-69) and the Black Death from the *Journal of The Plague Year* (Defoe 1722). True to disaster's etymology in astrology (which suggests that when the stars are in a bad position a bad event will happen), disastrous events have long had a transformative impact on culture and philosophy. Notable in this vein was the Lisbon earthquake of 1755. The arbitrariness of surviving the earthquake motivated Voltaire's *Candide* (1759), whereas Jean-Jacques Rousseau (Masters and Kelly 1992) used the earthquake as an argument against cities as part of his desire for a more naturalistic way of life. At a larger scale, attempting comprehension of disaster helped develop debates in Theodicy (disasters as possible illustrations/proof of evil) and the notion of the 'Sublime'.[8]

In the light of modern history at least, making an argument for positive disorder is not radical. As stated in previously, dissidence and rebellion have resulted in positive outcomes. Making an argument for positive disaster clearly hinges around the scale, type and context of disaster discussed (physical or natural verses social or emotional). There is also a particular function of disaster when associated with disorder. Conventionally, having disorder can be a type of disaster for those who control or benefit from

[7] Murray distinguished three main qualities of this new medium: immersion, agency, and transformation. By immersion, she means the power of the medium for helping the user to construct beliefs rather than suspending beliefs. (Murray 1997:181)

[8] Where Schopenhauer in *The World as Will and Representation* (1819:39) listed examples of the transition from the beautiful to the most sublime. For him, the feeling of the beautiful is pleasure in simply seeing a benign object. The feeling of the sublime, however, is pleasure in seeing an overpowering or vast malignant object, one that could destroy the observer.

the order. What is important in *Deviant* is the *threat* of narrative disaster, how the threat affects the participant and how they perceive their role when this threat and other more secondary permutations of disaster can be experienced.

It is well acknowledged in the fields of Immunology, Psychology and Organizational Behaviour that the threat of disaster acts a stressor, which is defined as: "an event or context that elevates adrenaline and triggers the stress response",[9] whereby it throws the body out of balance and forces it to respond. In a serene, un-stimulated state, the part of our brain tasked with responding to stress and panic is on standby. If a new stimulus such as the perception of danger (even fictive) is relayed via our senses, then we become more alert and attentive to the environment, which in turn can aid comprehension in the interactive context (Huitt 2003). Perception of threat is often seen as a negative aspect to be removed. Some associated practices located in the Destructive interactive model perform and often repeat disaster. However Deviant actively seeks give it conceptual weight rather than explicitly enacting disaster. In addition to this threat, Deviant also uses disaster at other levels such as:

* Narrative coherence (Ryan 2001): because the artwork is responsive, the participants will associate their exploration with a win/lose gaming model -- the hegemony in digital literature. This will come in the form of needing to understand either a premise, a conceptual basis or recognising and interpreting a narrative dénouement. Unless the author's goal is contrary to this -- failing to grasp the concept or gain access to and interpret a conclusion would be another type of disaster and a frustrating waste of time for the participant.

* At a literal level: within *Deviant* there is the fabula-based disaster -- the inescapable grisly set pieces the burning of the six accused and the protagonist Christian's physical abuses. In terms of drama, this plot disaster is a partner to the artwork's dissonant tone. Stronger than disorder, the threat of disaster normally creates fear, which in turn fosters a tension. In Deviant this feeling of dissonance or 'wrong' is also co-supported from the anonymity of the historical author.

Dramatologically and applying convention, disaster is placed just before the dénouement and subsequent conclusion, where all loose ends are tied up and the participant ends the project satisfied. Often all prior narrative events work to build up this tension, this curiosity and immersive fear of the imminent disaster. As detailed above, in terms of *Deviant's* internal chronology, first the participant visually and aurally experiences a sense of something wrong. They have to make inroads in exploring the various pathways and gain an awareness of routes not taken to feel that structurally the project does not offer traditional immediacy -- that there are limited or hidden areas within the artwork. This becomes clear when the participants move forward and cannot move back. As the narrative is unknown to most, the plot disaster rears up unexpectedly and thus perhaps shockingly, with only the tangible sense of dissonance as priming. Then, the traditional un-ravelling and re-ordering of meaning is withheld past the conclusion. Once, or *if*, the participant reaches the explanatory text at the end the project, they are then pointed towards another re-reading to explore avenues not yet travelled. This end-text reveals that the project is a not a fictive narrative and that it is based on a historical series of events. It is hoped that surprise occurs at this point, playing on a common assumption that most narrative artworks are fictitious, especially likely in this case, as some of the events visually depicted seem to be wildly impossible or farcical. This adds resonance to the participants' experiences in the project (further discussed in section 6).

The re-readings give the fixed plot disasters in the linear skeleton an iterative or cyclic quality. Repetition, linearity, and a feeling of being trapped in history are both the state of the female subject and the architecture of the project.

Within *Deviant*, the participant cannot alter the narrative sequence, even though there is a high level of interaction with the environment. This is designed to induce an uncommon feeling of disempowerment.

[9] At a more acute level the response to stressors yields an impressive array of physical reactions: acceleration of heart and lung action, pupil and blood dilation -- extra nutrients to muscles. It affects the stomach, intestines, tear glands, our ability to produce salvia -- to name but a few. Available from The Franklin Institute Online: http://www.fi.edu/brain/stress.htm [Accessed March 2007]

6 By Practice as a method

As an area of study, responsive narratives given its digital and narrative concerns problematically spans a number of fields -- Hyperfiction, Narratology, Games Studies, Human Computer Interaction to name but a few. In the early part of the Millennium it has been acknowledged that as an emergent field it suffered from being over theorized given its links to deconstruction and poststructuralist ideologies with scant few master-texts rich enough in terms of transparency in authorial process. Joyce (1987), Moulthrop (1991) and Jackson (1995) being the exceptions (Douglas 2000). Typical of this early period was with critique and theorizing of these artworks without the insight of producing the practice. This problem was also recognised in the early years of Game Studies where many theorists did not have sufficient insights into neither playing nor creating games (Frasca 2001).

This practical knowledge is especially key epistemologically, as creating responsive narrative is a complex and emergent process in itself. Much of the articulation of expression comes 'hardwired' from the very decisions of the designer who controls the imagery, structure and narrative content, by programming and creative acts. Then additionally, once the non-linear structure comes into effect the text generates expressions that the designer may not have comprehended or intended, at this stage the imagery, structure or narrative content is again edited, trimmed and reworked by the designer until the project articulates in an open non-linear but as desired manner.

Critical to offsetting the inherent subjective qualities in creating research by practice the author used a group of eleven experts[10] to reflectively review *Deviant* (2004: Chp 2.2). This group was invited on the basis of their interdisciplinary abilities, personal voice and commitment to the research area, and comprises a mix of digital artists (cybertext, hypertext fiction and media), designers (website, applied computing and games), writers (academic and journalistic), a poet and a curator. The strategy they employed to achieve a reading was not prescribed. This, it was felt, would allow for a naturalistic experience for both the participant and the author. The only specific outcome required was a typed and emailed description of their journey. Their responses helped further clarify the role and experience of the participant within Deviant.

Findings: given the disorder, how does the designer keep the participant on board?

Visuality: the first unanimously held opinion about the project was that, in visual terms, it is successfully compelling. The design choices, such as the depiction of the protagonist and the large level of detail within the drawings, were unanimously valued. The latter was the most mentioned, not only in rendering terms but also in the way in which the project moved, a common analogy being that it was at 'pixel' level detail. This resulted in

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[10] The Expert Participants

Prof Mark Amerika is Professor of Digital Art at the University of Colorado in the US.

Mr George Fifield is a media arts curator, writer, teacher and artist. He is the founder and director of Boston Cyberarts Inc., a nonprofit arts organization which produces the Boston Cyberarts Festival.

PhD candidate Gonzalo Frasca is a videogame researcher and developer, currently working at the Center for Computer Games Research at the IT University in Copenhagen. He's co-founder and senior producer of Powerful Robot Games, a videogame development studio.

Dr Raine Koskimaa has published four monographs and some forty articles, reviews, and essays dealing with digital literature, hypermedia, cyberpunk fiction, postmodernist fiction, narratology, and empirical participant-response studies.

Ms. Cynthia Lawson is an Assistant Professor & Director of the Integrated Design curriculum at Parsons the New School for Design. She is also the project manager on Salman Rushdie's Midnight's Children multimedia study environment.

PhD Candidate Nick Montfort is an author and programmer of interactive fiction and co-author of several Internet based electronic literature projects including The New Media Reader (2003, MIT Press).

Dr Anja Rau is an independent scholar who writes on the aesthetics of digital literature and is the editor of Tekka.net.

Dr Roberto Simanowski is an assistant professor in the department of German Studies at Brown University. He is also the founder of Dichtung-Digital.de an online journal on digital aesthetics.

Ms. Stephanie Strickland is a poet, writer and academic.

Dr Jill Walker is an assistant professor of Humanistic Informatics at the University of Bergen in Norway.

Dr Noah Wardrip-Fruin writes e-literature, and produces evaluative articles about it.

a feeling of having to observe the project in a unique manner, looking at the unusual subtleties -- looking 'very closely' at how it moved and how it visually changed.

Allure of dissonance: following on from the compelling nature of the visuals and in conjunction with the sound effects, the next successful and broadly revealed issue was the sense of a particular atmosphere within the project, namely a sense of dissonance. This feeling of disquiet, of narrative mystery, was seen to help encourage the participants' onscreen and mental enquiry. The threat of disaster and the presence of disorder created a context in which the expert group described emotions such as excitement, fear, curiosity, and, most importantly, a need to seek out the root cause of the dissonance -- to either put a stop to the unease or simply to understand why it existed. This illustrated the larger belief that a disturbed environment is negative and the order of things should be balanced.

Specifically within *Deviant*, this sense of disorder is from the inherent structural difficulty of understanding the project, how it functions, what its narrative is and what the position as participant will be. This component of the aesthetic was eased (in terms of ability to immerse) by the visual choices such as the hand-drawn line art of the representational style. For some of the experts the rendering was linked to a childlike worldview (Koskimaa, Fifield), and this combined with the threatening tone of the artwork and then by the narrative clarity on any second or more readings, created a stronger sense of dissonance.

The desire to uncover the reasons why *Deviant* had an uncomfortable or 'wrong' atmosphere was a useful and compelling tool in driving the participants' commitment to reaching the end of the project (traditionally when all is revealed). This as mentioned by some of the experts (Simanowski, Walker) was akin to being an active and exposed participant in a mystery novel. The need to know helped embolden some of the participants' resolve when faced with the inevitable frustration and confusion, driving them on to reach the end. In terms of the project's goals, this re-readability is a success.

Immersion & emotional attachment: some of the expert readers (Fifield, Walker) found that the portrayed threatening environment helped sharply focus awareness of their role. This focus was needed as they found themselves in shifting multiple roles opposed to a singular one: voyeur, concurrent bystander, witness, identifying with the protagonist(s) and a passive viewer unable to alter the cyclical events. It was found that re-presenting a real disaster, and after the first reading, re-living the imminent tragedy, adds resonance and a feeling of complicity to the participants' own experiences. Re-reading gave a fuller or altered opinion to some participants as they found themselves becoming more involved cognitively with the protagonists' suffering. Others enjoyed using the non-linear offshoots, which offered them new character based perspectives (resulting in different narrative understanding(s)), and others found pleasure in exploring more of the visual details (note this was a interesting memory and attention issue as the detailing was always there to be seen from the first visit).

7 Conclusion & Vistas

Importance of complicity, multiple and uncomfortable roles

As articulated within the experience of Deviant, disaster, disorder and their by-product dissonance were fundamental features in the communication of the project. Dissonant communication was harnessed into a positive in terms of achieving the projects goals, namely:

- re-reading(s).
- a level of emotional attachment and immediacy within a responsive environment.
- personalised interpretations.

However, consideration must be given to keeping participants committed to the discourse, as for most, disorder and disaster are actively avoided or at least unpractised phenomena. It was evidenced via the expert readers that an alluring visual aesthetic could do much to offset the fractures caused by inevitable non-linear disorder, thus enabling the disorder and disaster to be grown more fully in the design of the participant's experience. Within *Deviant* the overarching concept was: like the protagonist and her community the participant is trapped within a cyclical and disturbed historical text with multiple

possibilities in terms of conclusion. 'Freedom' can only come from a personal interpretation generated through exploration and interactions.

Deviant takes a gamble with frustration, as it requires intensive interactions to move chronologically forward. However, once the participant has passed a branching intersection, they are cut off from this until another re-reading; they have to move forward. In this sense, *Deviant* has to be significantly attractive and or playful in sustaining interest. Using the tropes of mystery and the stressor sensation associated with the threat of disaster -- the participants where propelled forward by their curiosity, excitement and fear (for both themselves and for the narrative protagonist). This stressor helped provide more cognitive attention in 'reading' the environment and being more perceptive of paths not taken.

One of the strengths of responsive media is the ability to generate multiple outcomes and experiences. Depending on the brief at hand this layering of meaning can be valuable – especially when complex ideas or situations need to be reflected upon. As part of the author's reflective analysis and comments from the expert readers the need for conceptual rigor over the various elements that make up the sum total of the participants 'take-away' experience was highlighted. Otherwise, a negative disaster can occur where the participant has no desire to invest in the dialogue (a problem in high-concept experimental artworks where the visuality is either niche or intentionally abrasive). Within *Deviant*, disorder was developed into 'otherness' and rooted, supported and fed by the source text. This conceptual depth or roundness is essential given the inevitable volume of effects from disorder and dissonance. The participants' struggle to create meaning (order) creates a more individual and original experience than possible in most other linear media.

At least currently when disorder and disaster exist, so does a state of 'otherness' and its subsequent dichotomies: other/self, different/same, new/old, truth/lie etc. This offers a way to highlight what is normal, hegemonic, expected -- the status quo. Concreteness, universally valid explanations or immovable 'order' should be questioned and revisited, and singular truths depending on context can be problematic. Responsive artworks are particularly rich for exploring the approach to narrative as laid out in this paper – as often multiple positions exist simultaneously, and this offers the valuable ability to interrogate differing positions and at a more individual or un-dialectical manner.

Transferable Elements:

* The key tenet of responsive narrative design is that conceptualising and orchestrating the participants experience is a core element to the brief. Following Nitsche (1998), Deviant treated and applied it as a 'plot' in its own right complete with escalations, non-sequitars and unconventional dénouement.

* An understanding that interaction design can offer more approaches than the Transactional or Gaming model. Unconventional methods of communication have much to offer in a marketplace where mass passive methods and standardisation are wide spread.

* The possibilities of exploring the dramatic tension associated with the threat of disaster as a way of creating better attention and perception. Fuelled by the correct position of (natural) disasters as being negative, the threat of disaster will always act as a stressor. Considering and offsetting this condition can allow the designer to harness the participants' focus and nervous energy, which in turn can be used for a close reading. Being more attentive in a dialogue can create an opportunity to reframe, comment and reflect on the multiple or complex issues contained within.

Vistas resident in *Deviant*:

* Exploring the feeling of complicity as a tonic to passivity and societal malaise. Creating experiences that make the participant more aware of their roles in society.

* The potential in re-presenting historical or non-fictive disasters, and imagining concurrent witnesses with a view to eliciting: change of perspective, cautionary tale for the present and a better awareness of history.

Responsive narrative as a practice is currently emergent and may be emergent for some time given the opportunities driven by technologies and the scope available in the various interaction models as detailed above. This process of emergence is in itself full of disorder, experimental, containing testing and theoretical analysis alike.

The models and approaches being tested and generated can offer fruitful insights for other design fields where the users/ participant experience is of value.

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DESIGN AGAINST AND FOR CRIME IN URBAN LIFE:
Crime Prevention through Environmental Design (CPTED) versus Design for Crime

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Abstract

Crime is a daily occurrence of the contemporary urban life. Particularly in urban environments, people experience crime in different and varied formats. It is also believed that particular types of crime can be reduced by a better design and maintenance of the built environment as well as public and personal safety tools. Using design to reduce opportunities for crime is known as Crime Prevention through Environmental Design (CPTED). CPTED advocates that a better design and an effective use of the built environment can lead to a decrease in crime and the fear of crime, as well as an improvement of the quality of life. Although CPTED has been effectively used for more than 40 years to reduce crime and improve a community's quality of life, it has been criticized for its limitations. As the main argument of this particular study, design as a tool does not serve in one, and a positive way. Any design move brings about a counter design reaction especially in conflicting situations where opposing parties like criminal-victim or offender-defender exist.

Keywords: crime, design, crime prevention through environmental design, design for crime.

1. Introduction

Crime is a daily occurrence of the contemporary urban life. In urban environments, people experience crime or fear of crime in public places that diminishes people's quality of life. Especially, there are increasing rates of street crimes and violence against persons, in every major city. That is why increasing attention is being paid to crime prevention through design.

It is obvious that particular types of crime and fear of crime can be reduced by a better design and maintenance of the built environment. In this case, in areas where opportunities for crime and fear of crime are high, environmental design can play a crucial role in reducing opportunities for crime and improving perceived safety.

Although CPTED has been effectively used for more than 40 years to reduce crime and improve a community's quality of life, it has been criticized for its limitations. Design as a tool does not serve in one, and a positive way. Any design move brings about a counter design reaction especially in conflicting situations where opposing parties like criminal-victim or offender-defender exist. In this study, the main purpose is while examining the relationship between crime and the spatial built environment by measuring the principles of CPTED to analyse and present also the ANTI-CPTED design tools of the offending parties.

2. Different Approaches to Crime and Crime Prevention through Design

2.1. Understanding Crime and Fear of Crime

Although the question -what is crime- seems to have a simple answer, it does not have a clearly defined answer. People have differing views of what is considered as a criminal act and what is not. Unfortunately, crime and the fear of crime are getting one of the most serious problems of cities and today there are increasing rates of street crimes and violence against persons. It is obvious that particular types of crime and fear of crime can be reduced by a better design and maintenance of the built environment. Crime and anti-social behaviour are more likely to occur if the design of the built environment is unsuccessful. Briefly, every person who lives in cities is potential victims for any crime incidents.

2.2. Crime Prevention through Environmental Design

CPTED is an approach combining psychology, behavioural and learning theory that focuses attention on the physical environment, rather than the social environment and also primarily tackles crimes such as street robbery and vandalism, as well as fear of crime in public places. CPTED advocates that the proper design and effective use of the built environment can lead to a decrease in crime and the fear of crime, as well as an improvement of the quality of life.

CPTED strategies mainly fall into four broad categories; territorial reinforcement, surveillance, access control and space management. Territorial reinforcement is one of the crucial points in the concept of CPTED. Community ownership of public space sends positive signals to the community. In other words, places that feel owned and cared for are likely to be used and revisited. People are also more likely to be protective of places with which they feel some connection. At that point, effective design, planning and space management help to stimulate natural community policing.

People feel safe in public areas when they can see and interact with others, particularly when they are connected with that space. Criminals are often hesitated from committing crime in places that are well-supervised. In this case, natural surveillance can be achieved by creating effective sightlines between public and private space which include access ways and meeting places. On the other hand, matching lighting types with crime risk and using attractive landscaping are also crucial.

Access control is another point that physical and symbolic barriers can be used to attract, orientate or restrict pedestrian and vehicle movement. They minimise opportunities for crime and increase the effort required to commit crime. By making it clear where people can and cannot go, it becomes difficult for criminals to reach potential victims and targets. Effective access control can be achieved by creating landscapes and physical locations that channel and group pedestrians into areas.

Finally, space management is linked to the principle of territorial reinforcement. It ensures that space is well used and maintained. Strategies include activity coordination, site cleanliness, rapid repair of vandalism and graffiti and the refurbishment of decayed physical elements (McCamley, 2001).

2.3. Crime Prevention through Product Design

If designers can prevent an object or a place being targeted by manipulating opportunities via design planning and details, it is possible to prevent the crime occurrence. Crime Prevention through Product Design involves integrating protective features into products in order to reduce their potential to become targets of criminal activity, as well as preventing their use as instruments of crime. It also emphasizes integration between a product and its protective features, which is a more effective and efficient approach than later relying on standard target-hardening measures for security (Clarke, 1999).

In addition to the physical features of the spatial built environment, furnishing and the details of designed street furniture are also crucial in order to prevent crime and the fear of crime in public places. Products or any details may sometimes increase the possibility of crime by encouraging criminals or potential offenders.

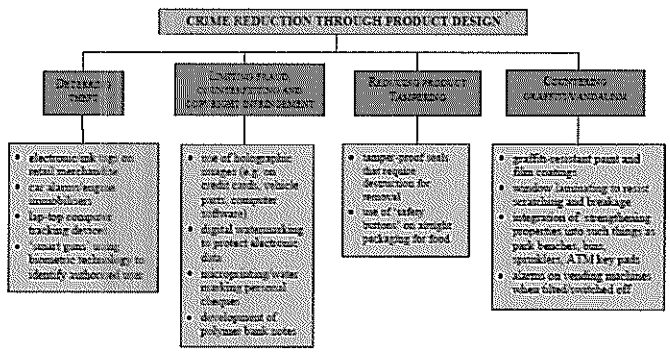


Figure 1. Crime Reduction through Product Design (Lester, A., "Crime Reduction through Product Design", Trends and Issues in Crime and Criminal Justice, no. 206, Australian Institute of Criminology, Canberra).

3. Measuring the principles of CPTED

In this study, design features of the area and whether or not it has any impacts on crime and the fear of crime have been considered in the light of the official crime data, systematic observation and user questionnaire. In order to clarify whether there are relationships between design and crime or not, users of Konak Square have been asked detailed questions about usage and design characteristics of the area in addition to the systematic observations.

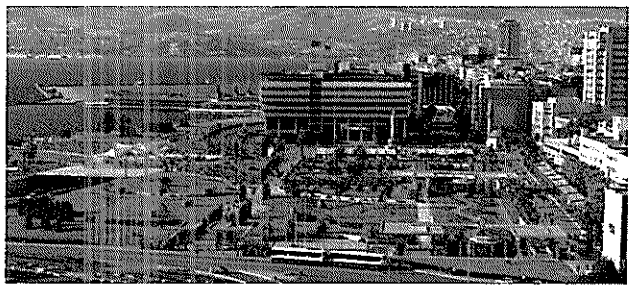


Figure 2. General view from Konak Square

3.1. Crime Characteristics of the Study Area

Considering the official crime records, the types of crime in case area are classified as; pickpocketing, snatching, wounding, theft from shop and forgery. In addition to the recorded crimes, there are another types of crime or anti-social behaviour which are not recorded but existed in study area; such as physical or verbal harassment or vandalism have been considered according to the results of the questionnaire and interviews with police officers.

At that point, the safety questionnaire has consistently reported that there are specific differences between recorded incidents of crime and the fear of crime of the respondents. In other words, users of Konak Square perceive their risk to be significantly higher and therefore discourage people from using the area, particularly at night. Another crucial point is that users of the study area, particularly women, feel insecure and vulnerable to crime especially after dark and the perceived fear of crime discourages them from using the area.

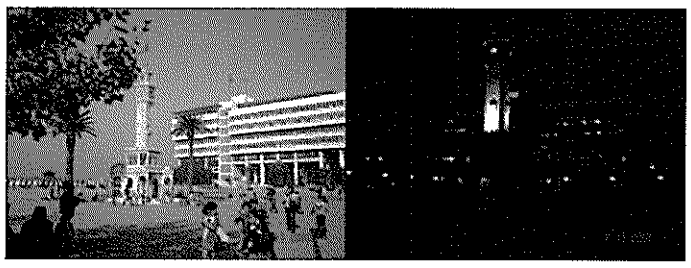


Figure 3. Konak Square-2006

3.2. Design Characteristics of the Study Area

In order to measure the principles of CPTED, Konak Square has been selected as a study area as being one of the most important and recently redesigned public space of İzmir. One of the main problem of the area is its incompatible activities that make the area crowded, disordered and thus, dangerous in many ways. However, considering the public spaces, the area should have been overlooked by surrounding activities in order to be safer.

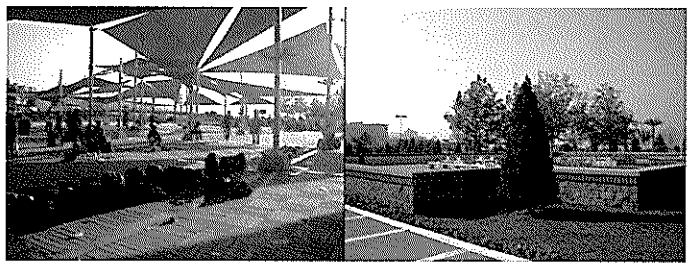


Figure 4. Design details from Konak Square

In addition, poorly lighted areas such as pedestrian routes or around quay or potential concealment areas such as public toilets or in and around of subway provide hiding chance for potential offenders and also increase fear of crime of the users of the area. On the other hand, because of several ways into and out of an area, there are potential escape routes for potential criminals. It has also been considered that, criminal activities are more likely to occur if spaces are unwelcoming.

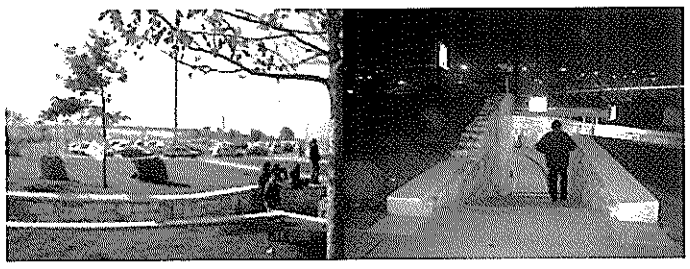


Figure 5. Design details from Konak Square

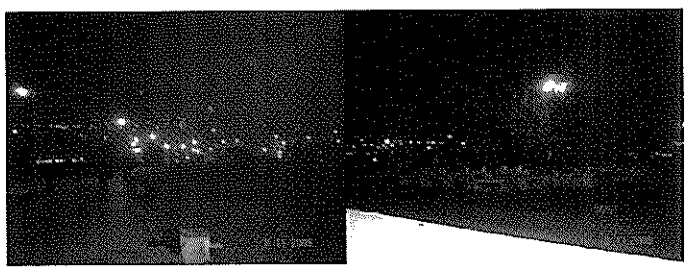


Figure 6. Night views

4. Results

In this study, the respondents have provided a rich source of data, concerning their personal safety concerns in and around of the study area. Although the findings support Crime Prevention through Environmental Design theory in many aspects, it also highlights the positive and negative effects of design on crime. The study area has been analyzed in the light of these principles; lighting, sightlines, concealment and entrapment spots, surveillance and visibility by others, land use mix and sense of ownership. At that point, the safety questionnaire has consistently reported that there are specific differences between recorded incidents of crime and fear of crime of the respondents.

Although the recent design of Konak Square does not completely adjust to the principles of CPTED, it can be accepted as "developed" when the former design of the area has been considered. The first specific finding is that the numbers of crimes in Konak Square have decreased after redesign of the area. Konak Square includes varied user profiles that use the area for many purposes. The area is an over-crowded public space during day time, because of being the intersection point for public transportation, and having official buildings, commercial places and shopping possibilities.

It is obvious that complicated situation of the area creates some security problems in Konak Square. In this case, limiting some of these incompatible activities may help to reduce the population of the area and thus, it makes the area more identified. In order to do that, some activities could have been kept away from the area. These kinds of precautions which limit the activities reduce and control the population of the area; it may also help to be more stable and secure.

The results of the safety questionnaire also have shown that users of Konak Square have not been satisfied with the security precautions of the area. In this case, they need additional security precautions in order to feel safe in Konak Square, such as better design features, compatible mixed uses that encourage activity and provide informal surveillance, in addition to better lighting which are included in the principles of CPTED.

5. Conclusion

The study has shown that there are close relationships between crime and design of the built environment. However, it has also been considered that design as a tool does not always serve in one, and a positive way. It sometimes becomes a problem as itself. That is why, planning and design features of the built environments, and also products should have been considered by thinking the positive as well as the negative impacts of design decisions.

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CITIES AND THE DESTRUCTION OF HUMAN IDENTITY

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Abstract

The next 20 to 25 years will see unprecedented growth in the size and scale of our cities. 2007 marks the first time in history that those living within an urban context outnumber those living in rural environments; by 2030 this will reach a staggering 5 billion (or 70%) of the world's population. The world stands on the brink of cities facing societal collapse, chaos and conflict. Architecture has always been considered to reflect its political, economic, social and cultural context, nowhere is this more evident than within the city. A call to democratise environments in line with a new global political ethos seems to favour a notion of non-identity as our cities become increasingly homogenised to meet the needs of diverse populations. Conflict theory contends that protection of our human identity is so profound that a threat to that identity will lead to conflict. This raises concerns about the destruction of human identity within our cities and the inevitable conflict that this will perpetuate, exposing the irony of democratising environments where the very notions they strive to uphold become the greatest threats to human agency. This paper poses questions vital for design and designers in the 21st Century.

CITIES AND THE DESTRUCTION OF HUMAN IDENTITY

This paper looks forward suggesting a scenario of megacities on the brink of societal collapse, chaos and conflict. While the issues and concerns facing these cities of the future are profound, this work focuses on issues of human identity, where a fundamental human need to establish the sense of who we are is compromised by a global political ethos which dictates its manifestation through environmental democratisation. Along the way, it raises vital questions for design and designers in the 21st Century: How does, or can the city respond to changing contexts and in so doing, provide a sense of identity?

Half of the world's population now live in an urban context with 2007 marking the first time in the history of our planet that urban residents outnumber those in rural areas. Estimates suggest that this will rise to over 70%, or 5 billion of the world's population by 2030. The speed and scale of this growth will however be more rapid in less developed communities. Developed regions will account for between 8% and 11% of the increase while developing regions see a rise of between 89% and 92% living within urbanised contexts. A 2005 report commissioned by the World Bank on Global Urban Expansion suggests that by 2030 the built up area of developing country cities will treble (from 200 000 sq km to over 600 000 sq km). Additionally, while population densities generally are showing a declining trend due to rising incomes, the density in developing regions will be expected to reach over 8000 inhabitants per square kilometre, while that of developed countries will increase by two and half times with a population density of 3000 per square kilometre (World Bank, Report on Dynamics of Global Urban Expansion). The global population presently stands at between 6.5 and 7 billion (having more than doubled in the last 40 years of the 20th Century – from 3 billion in 1959 to over 6 billion by the close of that Century). By 2030 slum dwellers will account for around 2 billion of the world's global population which is estimated to reach 8.1 billion. Reports also suggest that the rural population will stabilise at around 3 or 3.1 billion. The slum population will form part of

the urban context accounting for 2 in every 5 people (Figures taken from United Nations statistical databases). Previously derived social and cultural human frames of reference will no longer be relevant. What are therefore the new frames of reference likely to be? What sort of human identities are these likely to project? What responsibility do designers of the 21st Century have for creating the reference points? Or even do designers have some sort of perceived moral or ethical responsibility in this? Is there a conflict between sustainability and commodification driven by increased income levels? How do these questions relate to global mass urbanisation?

By 2005, over 3 per cent of the world's population lived outside their country of origin. Economic migrants are the world's fastest growing group of migrants and additionally, about half of these migrants are women. England now ranks fourth in the world for population density, with city densities higher than those of China, India or Japan. 2006 research by the Optimum Population Trust think-tank warns that while governments globally have tended to focus on the economic impact of migration, they have significantly failed to grasp potentially devastating environmental impacts. They urgently warn of massive resource and energy shortages facing even developed regions; concerns which so far appear substantially ignored (Optimum Population Trust). London currently boasts a resident population which represents each of the 192 countries on earth.

Hundreds of thousands of people continue to be uprooted by war, human rights abuse and natural disaster (some 19 million people currently fall within this category); these movements often occur between or within the poorest or least stable countries and consequently those which are least equipped to deal with the issues this causes. Notions of identity and the establishment of the sense of who we are can no longer be, if it ever was, geographically contained. As a consequence, our human identity and relationship to place seems to become increasingly fragile in the face of these global and global urbanisation trends.

The city, as it has stood through time, is a place of marked contrast. A signification of the kaleidoscopic political, economic, social and cultural images of hope, power, leadership and wealth, simultaneous manifestation of utter despair, poverty, isolation, hopelessness, crime, corruption and violence, add to this a colliding symphony of odour and sound and the vision of the city becomes whole. Architecture has always been considered to reflect its political, economic, social and cultural context; arguably nowhere is this more evident than within the city. However it would also seem that increasingly, while cities continue to reflect political and economic images, those images that reflect social and cultural contexts are becoming less evident, or at the very least, the social and cultural images which are reflected bear little relevance to notions of place or 'traditionally held' cultural identity symbols.

Architecturally, the discipline acknowledges the human being's relationship with their environment, recognising that the architectural landscape provides a built context for its people. Constructions of our experiences and understandings, are conditioned by the environmental images that surround us. The sense of who we are is intertwined with our environmental contexts. Consequently the city, and the architectural landscape that it presents, form vital elements in the development of our sense of self.

Increasingly there is a call to democratise our environments in line with a global political ethos. In parallel our cities are set to experience unprecedented growth and expansion not only in size, but also in the diversity of urban population, the scale of which does not yet seem to have been widely acknowledged within mainstream design discourse. With this comes a notion of spiralling anonymity and non-identity as traditionally held frames of reference for identity construction are threatened or rendered irrelevant. Bevan suggests that 'architecture has become a proxy by which ideological, ethnic and nationalist battles are ... fought' (2006:9). Whilst he relates this to conflict, speaking of the repression of architecture as symbolic of the repression of people, he also adds into this the destruction of buildings in the name of progress; 'as cities evolve and change, so structures become redundant' (11). This does not however diminish the ideological or political act which as a consequence is manifest architecturally. From an architectural position structures may become 'redundant' in terms what the new environmental context strives to express, but how an environment contributes to notions of human identity cannot so easily be consigned to redundancy. Issues of identity bound up with nationhood and culture, for example, national identity,

cultural identity and so on are brought into focus. The term global identity emerges perhaps as an alternative, however this is tainted with the elitism born of globalisation, and in a world where notionally 40% of urban residents, certainly within developing regions, will be living in slum conditions, as outlined previously, this seems to be at odds with itself before it begins. Conflict theory contends that protection of our human identity is so profound that a threat to that identity will lead to conflict; establishing and protecting the sense of who we are is non-negotiable. This contribution warns of the consequences of the destruction of human identity within our cities in terms of the inevitable conflict that this will perpetuate. The work also points out the irony contained within the concepts of control, authority and order in the name of democratisation, and consequently demonstrated through environmental manifestation, but which in themselves pose some of the greatest threats to human agency and the human capacity of choice in the development of sense of self, of identity.

The obvious question which is posed here is how cities work in terms of breeding conflict. Allied to that it is necessary to identify a methodology that will provide a useful frame within which to address this question. As suggested, increasingly emergent is a call to democratise environments in line with the global political ethos of democratisation, a term which is also ever more being used to replace the much maligned one of 'globalisation'. While the former concept would seem to engender notions of empowerment, protection of human rights and the rights of individuals, human equality and human identity, freedom of self-determination, along with cultural and social agency, it also, and equally, would seem to contradict this. Environmental democratisation seems conversely also to favour the creation of environments that are homogenised, sterilised, synchronised and ordered to accommodate the growing diversity within and range of cultures, gender, races, religions and creeds that are set to become part of and form our 21st Century urban societies. Add to this the unprecedented growth in the size of cities and number of inhabitants of those cities. What emerges is a global vision of megacities striving to uphold a semblance of political, economic and social order whilst simultaneously struggling to maintain even a basic infrastructure that will accommodate and facilitate the provision of the resources, goods and services to support the growing and potentially ever increasingly diverse population. Mexico City is a current example of a megacity. Its almost 12 million inhabitants suffer from appalling levels of pollution, traffic congestion, inadequate water supplies, social problems and endemic crime. Johannesburg and its satellite towns – satellite in name only – (with a total population of around 10 million) is not far off this either with estimates suggesting that by 2015 Johannesburg will become the 12th largest city in the world.

With the massive increase in urban populations, one of the most crucial issues facing developing countries will be the property rights system and the rights to property ownership as ways of overcoming poverty. De Soto (2000) makes a compelling case which aligns property rights with creation/ generation of capital, suggesting that the differences between advanced nations and the rest of the world 'largely' parallels property rights systems. Essentially De Soto argues that those not integrated or 'legalised' into formal property systems are not connected into economic systems and are thus not accountable to, nor can they be accountable within, governmental economic process, thus they neither contribute to, nor benefit from the advantages this can bring. Whilst this may currently hold true for developing regions, the expansion of urban centres in developed countries will not be immune from this concern either. Already growing property demand pushes the opportunity of property ownership beyond the financial reach of many, and with it the capital generating opportunity created through property ownership.

Conflict Theory and Conflict Resolution Theory

However, let us set these issues aside for a moment and consider what conflict theory brings to the fore. This contends that the establishment and protection of our human identity is so profound that a threat to that identity will lead to conflict; establishing and protecting the sense of who we are is non-negotiable. Conflict theory and human need theory are closely allied and agree on what are termed basic human needs, or BHNs: These are the need for recognition, security and identity. Work in conflict theory extends this contending that the former (recognition and security) are predeterminants for the latter; i.e. establishment and protection of the self (measured through recognition along with the security to establish who we are, as well as the right to make choices in this in terms of our human agency) are necessary for a sense of identity to be achieved.

Proponents of conflict theory and human need theory (for example, beginning with the early work of Burton in 1962 through to 2001, and including key individuals in the field such as Deng and Zartman 1991, Doyle and Gough 1991, Druckman 1993, Fisher 1990, Sandole 1990-93, van der Merwe 1989-93, Galtung 1976-96, Mitchell through 1990-2002 and Dunn 2001-05 – the body of literature is vast and well established) all agree on the fundamental position that conflict arises when identity is threatened. Furthermore, in terms of conflict resolution theory whereas as wants are negotiable, needs are not; the need to establish the sense of who we are, our identity, and the right to choose this, is a fundamental and profound human need which cannot be negotiated. Human need theory also deals with issues of human rights suggesting that human rights are associated with particular systems of government and are therefore distinguishable from BHNs. Conflict resolution theory however acknowledges that just as the human need to establish our identity is non-negotiable, where human rights become constitutionally entrenched these become a *de facto* need and are therefore equally non-negotiable (Doyle and Gough 1991).

Conflicts range from minor disagreement through to violent confrontation or expression. At the core of conflict, almost without exception, challenges to identity can be identified as either the sole or significantly contributory underpinning cause or influence which, if not addressed, will result in an escalation of the conflict. Conflicts over identity are frequently difficult to determine in the first instance as the outward expression often, or even generally, masks the actual cause. These conflicts are also particularly difficult to resolve because 'what might work' in terms of conflict resolution is not considered to be something which can be negotiated. Conflicts about identity which are permitted to escalate can ultimately become so complex that they may never truly achieve lasting resolution because of the necessity to resort to a negotiated position at best, or where systems of power and authority override the individual identity need. Identity conflict can be found in every sphere of society and at every scale of confrontation.

Key elements of identity construction from the position of BHNs and conflict theory are reflected in the complex interrelationship between recognition, security and identity along with the right to make choices regarding our identity Complex conflicts over identity, and those which are consequently exceptionally difficult to resolve, normally occur when individual components relating to identity construction are either thwarted or threatened in different and often opposing ways.

Phenomenology as methodology; its relationship to the environmental context and conflict theory

Phenomenology provides the frame for an ontological epistemology which relates the sense of who we are, our identity, to the environmental context explaining that our identity is constructed through the lived experience and that this lived experience occurs within an environmental context. Since the work by Husserl in 1931, *Ideas: General Introduction to Pure Phenomenology*, and subsequently developed through the 1954 and 1978 texts by Heidegger concerning the study of the nature of being, which linked notions of building, dwelling and thinking as fundamental to the human concept of experience and existence, the nature of being has been considered to be concerned with experiences and the expression of those experiences in defining the human being's comprehension of their beingness. Heidegger (in translation from his text *Vortrage und Aufsatze, Bauen Wohnen Denken,* 1954) develops the relationship between the Old German for build, "buan", (also meaning "to dwell"), and "bin", (or "am"), deriving from "to build" thus uniting the conceptions of build and "being" ("am") through the act of dwelling (living), and recognising the outcome, the existence or state of "being", as the process of the performance of being.

Architecture as a discipline recognises phenomenology as a methodological frame by which to not only derive an understanding of the human nature of beingness, but to understand the nature of that beingness as a relationship to architectural concepts such as place and space. The sense of who we are is inextricably intertwined with our environmental context. Some 50 years since the work of Husserl, Norberg-Schulz (1971, 1980, 1988) employed a phenomenological frame to suggest that architectural space provides an environmental context and images which guide human experiences and understanding of the world in which we find ourselves. This has also been explored and

developed by others such as Merleau-Ponty (1960s), Satre (1958) and Casey in the 1990s. Phenomenology has been used architecturally to provide the methodological frame that endeavours to reconcile the esoteric nature of space with a 'lived-in' space which acts as a frame of human experience in its full complexity. The architectural landscape contains us as human beings, providing the context for and of our experiences. The link can then be made of the synchronicity between the architectural context and the contribution of this towards establishment of the human inhabitant's sense of identity.

While the nexus between phenomenology and the architectural context is well established; the relationship between phenomenology and conflict theory as well as that between the architectural context and conflict theory are less so for these require a cross disciplinary engagement between architecture and international relations' enduring concerns with peace and conflict. The relationship between phenomenology and conflict theory works as follows. Conflict theory asserts that if identity is threatened then conflict is the likely and inevitably result. However conflict theory largely relies on human need theory (which identifies as BHNs the need for recognition, security and identity – with the former being subsumed into the latter) for its description of identity construction. What precisely is being threatened remains unclear. Both these theoretical areas lack an ontological epistemology within their discourse or at the core of their assertions about the nature of identity. Phenomenology posits that human identity, how we develop and attain the sense of who we are, is bound up with the lived experience and that this is part of a synchronicity and continuum of experience that is contained within a particular context at least part of which is related to the environmental.

Empirical research conducted in squatter camps in South Africa between 1996 and 2004, principally around the migration of rural inhabitants to urban centres and the subsequent violence which occurred as a result of forced removal or the threat of removal of squatters from shacks to townships on the outskirts of the urban centres, supports the assertions of those such as Bremner (1998), an eminent South African architect and critic of apartheid architecture. Additionally research also suggests that the ontological epistemology presented in the phenomenological discourse holds true within the context of conflict and human need theory. Rural migrants had moved to urban centres to join the perceived urban economy. However the frames of reference held by these people in no way prepared them for the changed contexts that they were about to encounter. Contrary to many perceptions, work opportunities were limited and where those did exist, the skills and experiences of the migrants did not prepare them for entry into the labour market. People were rendered jobless and homeless and consigned to join swelling squatter numbers with very little real prospect of emerging from this. Their entire sense of self was under threat as they were forced to absolute poverty and living conditions of total human degradation. In a country of eleven 'official' languages (and others not rendered as 'official'), even basic communication was frequently problematic. Squatter numbers exploded and still migrants continued to besiege areas already hopelessly over crowded. Illegal migrants from neighbouring countries contribute to the problems. To compound matters even further governmental obfuscation over the status of homeless people (homelessness was a term used to describe those rendered homeless due to political structures under the apartheid system) post 1992 consigned the squatters to become 'informally housed communities'. The violence that erupts in these areas is fast, anonymous and unaccounted. These areas remain largely no-go areas, and violent conflict is endemic. Not only had these people had their identity stripped in terms of human dignity, they had and continue to be totally marginalised, and in consequence segregated, through the simple act of reclassification. The text by Cohen and Deng supports this finding, suggesting that the South African Government fails to recognise the millions of 'black' South Africans who lack land or adequate housing due to 'displacement' under the apartheid system (see Cohen and Deng 1998). While many describe themselves as homeless, their plight of homelessness is now unrecognised. Bremner describes a new landscape whose properties are associated with the fear begotten of endemic crime that transcend the spatial; 'new urban spaces, new divisions of power, new urban cultures, whose primary properties are segregation, marginalisation, privatisation, militarization and fortification are emerging' (1998:B2). The irony of this statement is that it is made within the context of a newly 'democratic society'.

How do cities work to create conflict

In simple terms, because the environmental context fails to provide reference points for its human inhabitant, it (the environment) fails to support a concretisation of identity. As a consequence conflict resides between the human inhabitant and their environment. That outward demonstration of conflict subsequently manifests itself in different ways does not diminish that its root cause lies over issues of identity.

Architectural discourse recognises the relationship between the human inhabitant and the environmental context and extends this through phenomenological methodology to contend that the environmental context, the architectural context that is, becomes integral to the development of human identity. The role played by the environmental image becomes a profound contributor in the process of "beingness". In this delicately orchestrated synchronicity the objects and events of our lives are elevated to signs and symbols of greater understanding and significance. The architectural landscape emerges as more than merely a built form. Architecture can, for example reflect a political ethos, a national identity, regional identity, cultural identity, the home becomes an outward concretised manifestation of its inhabitant and so on. In other words the architectural context is inextricably intertwined with the sense of who we are.

Conflict theory is brought to the fore as a mechanism by or through which to explain the conflict which results from a threat, or challenge to, the environmental context. Equally, conversely, and perhaps more commonly understandable, the environmental context may be changed to reflect a changed status, such as political status, or new 'identity' of inhabitant. For example buildings and streets, even cities are often renamed following the overthrow of political regimes; monuments acquire new meaning, street gangs will 'tag' a physical environment to demarcate the area with a particular identity, and physical landmarks may be forced to make way in the name of progress. In other words as a result of the need to establish an externalised manifestation of identity, the environment is manipulated in some way to become a reflection of this. This process of changed identification can result in anything from minor resentment to violent confrontation as the inhabitants of that environment struggle to regain or bring their sense of identity in alignment with a sense of identification with their environment. Environmental fortification is often an attempt to preserve a particular status quo ultimately leading to segregation and/or marginalisation. Many European cities have for some time now been adopting compact city policies in an endeavour to limit urban expansion and balance environmental impact. These policies foster increased population density through infill and intensification of existing urban settlements simply leading to different environmental concerns. There is a greater mix in demographic profile leading often to either a sense of isolation one the one hand or a type of cultural 'ghettoism' on the other. Clashes between the dominant community group and the 'infill' result as a consequence of the destabilisation occurring within the existing urban structure.

Our relationship to place emerges as more vital perhaps than ever before, yet equally that relationship now seems set to come under greater threat than ever previously experienced. Initially the work posed a series of questions vital to designers in the 21st Century: about cities and changing contexts, about human frames of reference, even about perceived moral or ethical standpoints, about sustainability and commodification. These are essentially questions about the role of design in the 21st Century in terms of the products, services and architectural landscape, the cultural reference points for society that are created in the face of the increasing fragility of human identity as consequence of the profound global urbanisation trends which will be faced in the next 20 to 25 years.

The perception is that democratising environments will in some way eliminate identity and so cause some sort of cataclysmic conflict eruption. This is not the case. All that needs to happen is for people, human beings, to be faced with environments that fail to support the human sense of which we are, removes or subjugates human agency to environmental authority and in so doing creates environments that ultimately alienate. The state of conflict becomes endemic within and at every level of society. It is complex, harder to identify and infinitely harder to resolve.

The architecture of a city expresses the very being of a society; that being (the being of society) is an ordered being, of systems, power and authority; a regulatory framework of the

manner in which a particular society functions. Architecture serves the powers in place, projecting the socioeconomic and political views of the existing power. From this notion emerges the concept of position, how the human inhabitant positions themselves, or is positioned, in relation to that framework which the environmental context has established. Through this notion of position, we are immediately cast back to the phenomenological context. Each individual occupies a space which at that time is uniquely and entirely their own, yet they continue to be subject to the authority of that space. The environmental authority conditions, the human inhabitant is merely temporary and provisional and in this process they become irrelevant and anonymous. These conceptions of a human being who is both irrelevant and anonymous, but simultaneously undergoing a lived experience which is in some way being conditioned by their environmental context is a contradictory relationship and must, if conflict theory is to be acknowledged, inevitably lead to conflict.

A number of texts have emerged dealing with architecture as power system; specifically Dovey (1999), *Framing Places: Mediating power in built form* and Findley (2005), *Building Change: Architecture, Politics and Cultural Agency* and most recently, Bevan (2006), *The Destruction of Memory: Architecture at War*. Findley describes four spatial strategies used to exercise power which he identifies as: the construction of hierarchies, segregation, marginalisation and finally, long-term, large-scale mechanisms of spatial transformation like apartheid, colonialism and globalization. He suggests that when these are extended to the architectural scale, they become 'so enormous that individuals have little leverage to defy them or their attitudes of superiority' (Findley 2005:4). The work continues asserting that 'such an exercise of power robs people of the ability to act on their own behalf in political, economic, cultural and spatial terms. The denial of agency is both a brutal outcome of repressive power and the seed of ... resistance to it' (4-5). The environmental context is, by this process, an instrument of and conducive to conflict despite, or because of, its assertion of authority and order.

While the 1954 Hague Convention made illegal the damage to any cultural property during acts of conflict: 'it is prohibited to commit any acts of hostility directed against historic monuments, works of art or places of worship which constitute the cultural or spiritual heritage of peoples, and to use them in support of the military effort' (Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, The Hague, March 1999), a conference in 1999 in The Hague drew up a Second Protocol to the Convention endeavouring to more firmly entrench criminal responsibility for damage to such property. Currently the United Nations has formed a rapid reaction force to be deployed where cultural sites are at threat from war or natural disaster. While these developments are pleasing, relatively few countries have so far signed up, and in reality during conflict very little regard has been paid to this. For example in Kosovo ethnic riots during 2004 saw Orthodox churches and monasteries in Prizren severely damaged or destroyed. Reprisals for this led to the destruction of the last remaining Mosque in Belgrade. Additionally not all property (and/or buildings) which are of cultural value are designated in such a way as to fall under this protection. In non-conflict situations this would of course not apply, acts against that which constitute cultural or spiritual heritage would face very little charge of illegality and would largely have to rely on public outcry. Ultimately, in more general terms, the decisions effecting manifestations of 'cultural value' are all too often judged or determined by political or economic policies based on expediency.

The discourse on memory study is rapidly becoming well established as a discipline in its own right exposing how memory is created, manipulated and chosen, forging and forming our human sense of who we are and providing the position from which to explain the understanding that we make of our world. Symbolism is implicitly intertwined within the creation of our spaces and places; the inherent identity of these that is in consequence created impacts on how they are perceived and understood. Constructed from metaphors and symbols, visual images and literary narratives, through to tangible built forms of the environmental landscape, the memories and truths that we come to hold become immersed within interpretation of the representations that surround us. These representations are part of the inherent human identity construct.

To describe all the tenets of democracy is not within the remit of this work other than in their broadest sense as outlined earlier. The two greatest threats posed to environmental contexts in

support of human identity are firstly (although not necessarily in a hierarchical sense) the subjugation of human agency within architectural systems relating to power and authority and, secondly, to the increasing calls to sterilise environments so as to rid them of all semblance of identification symbols whether these be cultural, religious or any other. Opinions on these actions are divided. Some suggest this makes for greater inclusiveness, social integration and regulation while others will argue for the sense of alienation and isolation from that which is familiar and which ultimately engender a sense of belonging. The direction and answers are by no means clear or simple. But what is incontrovertible is that environments of the future, whether these are within the context of the megacity or the compact city, will threaten human identity constructs as we know them.

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INVENTING DESIGN IDIOMS FROM THE PLURALITY OF IDENTITIES IN SOUTH AFRICA

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Abstract

Products can, and do, provide representations of the identity of a nation. The difficulties of appropriate representation in post-apartheid South Africa provide a locus for proposing new visual idioms, and for examining questions of identity, representation and presentation in products. This paper seeks to develop strategies for developing new idioms that arise out of the questioning of the boundaries of South African identity. Such identity is profoundly unstable, making it preferable to maintain a plural rather than a single identity for design in South African products. The method used seeks to unsettle the hegemony of western aesthetics by transforming selected visual and tactile features of traditional African art and contemporary African crafts into new stylistic features. This ideology is put into practise using strategies which navigate a path between modernity and tradition, and is expressed in the form of designs for two sets of cutlery. The paper concludes by suggesting that the only viable way for Africans, so also South Africans, to establish new visually representative identities in a globalised world is to reference local crafts and traditional artefacts.

Introduction

Twelve years into democracy and South Africans of all cultures still wrestle with the idea of a fitting South African identity. This obsession touches all aspects of our lives, but is especially prevalent in objects and visual devices which have the potential to symbolise our identity. The reconstruction of identity(s) and the replacement of symbols is driven by the need to signal that we are a new, democratic nation.

The need to construct new identities to replace the old raises difficulties of inclusion and exclusion, since, on the one hand, symbols evoking the apartheid era are inflammatory because of their exclusionary nature, whilst on the other objects symbolising traditional black cultures (the obvious choice to represent inclusivity) cannot simply be uncritically appropriated without acknowledgement of their ownership by the cultures in question. Alongside this search for appropriate symbols lie the difficulties of accommodating the often conflicting demands of collective (national) and individual (private) identities in a country highly sensitive to the imposition by one group of its culture (the white minority) at the expense of the others (the cultures of the black[1] majority).

The subject of identity formed part of my masters dissertation, titled *African style*[2] *in cast products*, which sought to explore how new idioms in product design might legitimately reflect the complex nature of South African identity. The dissertation proposes a number of strategies for developing these styles, or idioms, each strategy finding expression in a range of cast cutlery. Here I explain one of the approaches by which these strategies were developed, and how the strategies were applied in the design of two sets of cutlery.

[1] Black is used by the South African government to denote all non-whites, including so-called Coloureds (mulattos), Indians, and Asians.

[2] The *African style* in the title is deliberately ambiguous, since the notion of style forms a significant point of departure for discussing other concepts such as aesthetics and the exotic.

Towards an African identity

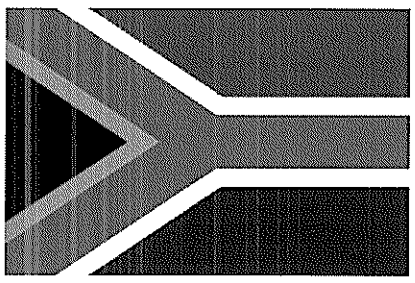


Figure 1. South African flag

In South Africa examples are everywhere of new symbols acting as outwardly visible confirmations that the underlying structure of our society is changed, from overtly national symbols such as the national flag (Figure 1) and national sports teams and their supporters (Figure 2), to more commercial concerns such as the content of television and radio stations, and 'Africanised' interior styling suggestions in decorating magazines.



Figure 2. Springbok rugby team supporters

Successful products designed and made in South Africa also become a source of pride for many South Africans, symbolising for them the ingenuity and manufacturing prowess of South Africans. So it might seem reasonable to expect a South African designer to want to create a South African style, and not a generalised 'African' style. However, there are difficulties in claiming that a new style is either 'African' or 'South African'. 'African style' is preferred for this project, because although it may be seen as too generalised to allow the creation of a specific style, this very openness permits a wider range of sources. By contrast, the term 'South African style' implies the creation of a symbol to help construct a national identity. To claim to create such a symbol is arrogant. I argue that whilst a designer can lay claim to creating a style, the adoption of such a style as a national symbol can only happen by a process of broad consensus.

Representation and legitimacy: someone's been swimming in my sea

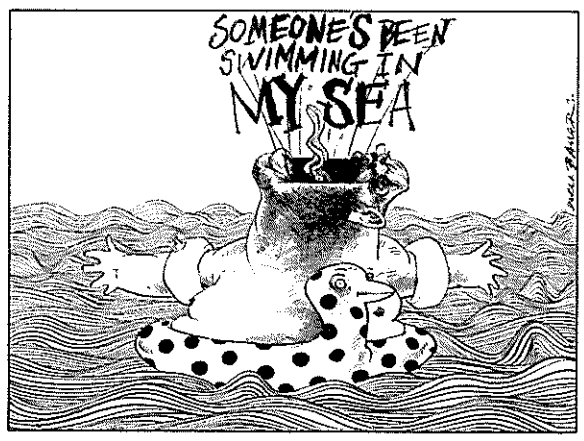


Figure 3. Cartoon by Derek Bauer for The Weekly Mail

The cartoon (Figure 3) by the late Derek Bauer (1989:64) succinctly captures the absurdities surrounding issues of ownership, legitimacy, and identity engendered by apartheid in South Africa. The Reverend Allan Hendrickse, 'coloured' representative and member of the tricameral parliament, took a swim from one of Port Elizabeth's Whites only beaches in January 1987. The then president P. W. Botha demanded an apology from Hendrickse, and got it.

On the issue of identity and ownership, Okwui Enwezor, artistic director of the 1997 Johannesburg Biennale, sparked off an intense debate in the art community of South Africa in his paper, *Reframing the black subject: ideology and fantasy in contemporary South African representation* (1997). The paper challenges the legitimacy of the manner in which many white artists represent the black body in their work. He believes that South African white artists still dominate the arena of visibility, and in their subject matter frequently (mis)represent the black body as abject. Such (mis)representations work against the project of the rainbow nation and deny the creation of a new non-racist, national identity. The paper challenges the

legitimacy of the manner in which many white artists represent the black body in their work. He believes that South African white artists still dominate the arena of visibility, and in their subject matter frequently (mis)represent the black body as abject[3]. Such (mis)representations work against the project of the rainbow nation and deny the creation of a new non-racist, national identity.

Enwezor's paper elicited a barrage of responses in *Grey areas: representation, identity and politics in contemporary South African art* (Atkinson & Breitz 1999). It is not possible to present the full range of responses here. I sum up the criticisms exclusively because they suit the purposes of this research. Many of the respondents supported and developed Enwezor's criticisms alongside their own criticisms of his paper.

Firstly, Enwezor's idea of how representation works fails to recognize that there is a significant difference between speaking *about* and speaking *for* (*representing* and being *representative*). White artists are not necessarily claiming to speak on behalf of blacks in South Africa when they speak about their repression. Secondly, Axel (1999:42-46) notes that Enwezor seems to suggest the apartheid notion of the male white body representing our national identity should be replaced by the male black body for the same purpose. This is problematic because it supplants one monolithic idea of national identity with another. In the process it continues to disenfranchise women and other races.

Thirdly, Enwezor is accused of performing the same (mis) representative error of which he accuses the artists. By imputing intentions to the artists that they do not themselves express, they are robbed of the right to speak for themselves. Fourthly, Burnett (1999:79-84) points out that to disallow representation of, and access to, the other[4] is to set up apartheid-like boundaries between race, culture, gender and sexuality.

One can take this last point a step further. This restriction of representation does not take account of the importance of the other in the construction of the self. This point is especially important in South Africa today because the old habits of polarising and separating people have not disappeared. In addition, the categories of race, language, gender, and nationality do not exist in any essentialist way, but are constructs. Their boundaries are fluid and blurred, so that any understanding of representation, advocacy (being representative), and identity formation (e.g. 'national identity') must first take account of the inherent artificiality and instability of its own, created, boundaries.

If the construction of identity in post-apartheid South Africa is to be in any sense democratic then it must encompass both the speaking about and speaking for across all previously artificially constructed boundaries. Under these conditions it becomes difficult to conceive of a single national identity. In addition, the debate about identity in the arts forms only one component of a national identity, and it is a debate that is likely to mutate and evolve along with changes in society. Identity cannot be fixed or finalised, it can only be a provisional locus of discourse *about* identity.

Although the above debate is primarily situated in the visual art world, it has obvious resonances for this project. I have not made any direct representation of the (black) body, nor

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[3] The abject is a term used in a specialised sense in art criticism. The psychiatrist Julia Kristeva interpreted this term in a manner that was applauded by feminists, in her book Powers of Horror (1984). Dino Felluga of Purdue University (2003: online) summarises Kristeva's abject as "...the human reaction (horror, vomit) to a threatened breakdown in meaning caused by the loss of the distinction between subject and object or between self and other". The abject "...has to do with "what disturbs identity, system, order. What does not respect borders, positions, rules" (ibid). However, it is not at all clear that Enwezor means to use the word in this sense. It seems to read, in most places, as the commonly understood 'without dignity', or 'wretched'. See, for instance, pages 386, 388, and 397 of Enwezor (in Ogulbe & Enwezor 1999).

[4] This is a philosophical and sociological term denoting those aspects of the universe, including people, which we find strange, mysterious or alien. The otherness of unfamiliar objects, customs, and people from other cultures enables us to see ourselves the way we do because it allows the construction of barriers that show where the self ends and the other begins. A limitless self is inconceivable.

do I attempt to speak directly about or on behalf of anyone in Africa who was, or is repressed. However, my intention to reference 'traditional' African artefacts to create an identifiable style in products means the research must question rights of ownership (copyright), appropriation and the representation of aspects of traditional cultural artefacts. This is necessitated by my status as a westernised white South African male attempting to represent something about (black) Africa.

Before continuing, there are at least two significant differences between designed objects and the artworks referred to by Enwezor that must be taken account of. Firstly, designed objects and the artworks in question differ in their temporalities. The work of the artists with whom issue was taken by Enwezor look mainly at the recent past and deal primarily with politically sensitive questions. This project, on the other hand, although looking to be influenced by both a more distant traditional African past and a contemporary present, is essentially an anticipation of a future reception of newly invented styles. The greater temporal distances involved, both forwards and backwards in time, makes the research far less politically sensitive, shifts the emphasis to issues of economic upliftment, and positions it in a commercial world where concerns of consumerism take precedence over politics.

Secondly, the nature of designed objects themselves have a very different contemplative role to that of artworks, whether one is looking at what may be intended or what may be interpreted in a designed object. The designer may intend to include his or her own individually conceived metaphorical or figurative meanings into the design of an object, but the intended functionality[5] of a designed object is one that is agreed upon in a cultural and social context. In addition, functionality is a more significant aspect of a product than it is of an artwork, and functionality is influenced by the technology used to make the object, the fact of its repeated mechanical manufacture, and the means and rationale of the commercial world by which it is to be disseminated. The range of constraints that a designer deals with thus significantly narrows what may be expressed in the first place. Paradoxically, this widens the scope of interpretations because these factors, which are outside the designer's control, already encompass aspects of the society we live in. The artist, by contrast, has much greater control over what he or she may express and also thus has a stronger, although by no means definitive, influence on what can be interpreted.

The reception of designed objects, like artworks, is highly provisional. However, the many unanticipated uses to which an object may be put, and the range of contexts (physical, geographical, temporal and social) in which it will be found is very different to those of artworks. Thus its meanings are accumulated, or altered, through factors different from those of the artwork. The designed objects of this project are conceived in an African context, but are meant to be consumed and interpreted in a world market. They are intended to speak both *about* and *for* Africans.

Nefarious boundaries: who am I?

Thus far, identity within the local context of post-apartheid South Africa has proved to be profoundly provisional and complex. But identity is also shaped by interactions with a wider world. South Africa is seen as the economic powerhouse of Africa, and is the most modernised of African states, and thus more globalised than any other region of Africa. It has appointed itself as custodian of peace, the overseer of development, and the gateway to Africa under the guise of various regional bodies – AU, NEPAD, SADEC. Is it reasonable to assume that the influence of a post-modern First world is probably more pronounced here than elsewhere in Africa?

There are a number of views of Africa vis-à-vis globalisation, modernity and post-modernity which entail complexities too lengthy for discussion here[6]. However, some comments from a Postcolonial Studies perspective are relevant to this study, and so are worth examining more closely.

Postcolonial Studies seeks "...privileging particular methods and problematics so as to subvert the self confident

[5] Almost any designed object can be used in ways not intended by the designer (see Gibson 1979:chapter 8; Dormer 1990:chapter 6).

[6] See Featherstone (1990), and Werbner & Ranger (1996) for a fuller discussion.

An important rider to this argument is that no-one should be discouraged from creating styles that reference a specific traditional 'ethnic'[9] aesthetic. To do so would be to commit the same errors pointed to by this text.

Sidney Kasfir, author of *African art and authenticity: a text with a shadow* (Oguibe & Enwezor 1999:88-113), takes issue with a similar desire by Western museums and art collectors to define and proscribe limits for the notion of an 'authentic' African art. Kasfir dismantles such categorisation by showing that it is not possible to establish valid criteria by which boundaries can be established for a 'pure' precolonial Africa, free of destructive Western 'contamination' and intervention in African cultures, or a culturally static period of African history. For Kasfir, the reasoning by which the Western art world proclaims any African artwork authentic or inauthentic is deeply colonial, and in truth merely reflects Western tastes. Taste here is the elitism that attends connoisseurship. It is the selecting of objects for their status value, such status being conferred according to the values and mechanisms of Western markets. These markets have scant regard for the values of the Africans who conceived, made, and used such objects in everyday life (before they became objects for elite Western consumption). I am not here equating the conditions of inventing a new style with those of collecting African art, but wish to point out that it is the same sense of elitism that is operative in both spheres in deciding what may be termed authentically African.

It should by now be clear that I take issue with the prescription and arrogation that I see as inherent in appending a national label to a newly invented style. The label Africa is also problematic, in all of the same ways as described above, but has the advantage of allowing a far broader range of strategies to emerge for the creation of styles, and is general enough to circumvent the imposition of expectations regarding a South African style. 'Africa' is a deliberate strategy to clear a conceptual space for myself, yet still ground this project in South Africa. South Africa is the departure point for identity, and Africa the departure point for style.

Transformations

The theoretical research of my project allowed me to propose three ideals by which the strategies for creating new styles were developed. I present them here because they feature in the examples of cutlery that follow.

The first ideal, which I have argued in the text above, is that the nature of African identity must be questioned so as to avoid producing stereotypical or ethically questionable presentations of Africa in the styling of products.

The second ideal says the tropes of modernity and tradition, found in the manufacturing technologies of modern and traditional societies respectively, should be extracted to develop styles that do not reproduce either trope uncritically, but rather make use of the liminal space between the two to develop unique styles.

The third ideal suggests that in the context of an aesthetically crowded world the use of exoticism, in particular that of a mythical 'Africa', is a particularly suitable strategy for stylistic differentiation.

Thus, for this project, any inspirational source (whether of traditional or of contemporary African origin) is filtered through these ideals so that it can be transformed into a visual or tactile feature that is intentionally new and exotic.

The main challenge for successfully including such ideals in the practical work has been to strike a suitable balance between the poles of modernity and tradition and their respective aesthetic logics. To follow too closely the aesthetic logic of modernity is to inscribe mainly Western values on the surface of a product, thereby losing the distinctiveness to be had from a more obviously African (exotic) flavour. To buy too strongly into the aesthetics of traditional African art is to risk creating an impression that the products have not gone far enough in interpreting and transforming such influences into something new.

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[9] Ethnicity should be recognized as a colonial, and thus problematic, strategy of categorizing.

Of course, the theoretical ideas emerged as part of the dialectic of theory and practise (praxis[10]) that characterises a project of this nature. The postulation of ideals necessary for judging a style to be both unique and African depended first on embodying fledgling ideas as drawings and models. These media readily permit the expression of intuitively understood ideas without the need to first name or categorize their distinctive conceptual features. Once expressed in concrete form, the ideas were analysed carefully for their expressive qualities. These qualities were then articulated as ideals for further analysis and refinement. The ideals that emerged from this process provided a constructive rationale by which to proceed more confidently in proposing new ideas, and for assessing the validity of earlier ideas.

Strategy one: traditional African art

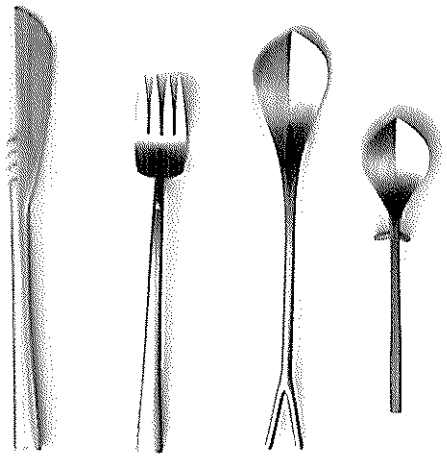


Figure 4. Cutlery inspired by traditional African artefacts



Figure 5. Back view of cutlery inspired by traditional African artefacts

The cutlery set in Figures 4 and 5 is meant to be exclusively inspired by traditional African artefacts. The idea came about because the feature on the heads of some Northern Nguni dance staffs (Figure 6) reminded me of eating utensils, so these features became the basis for the decorative elements of each utensil.

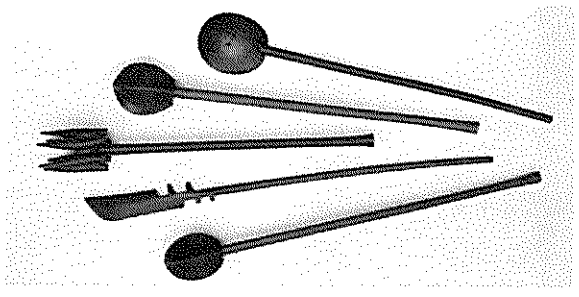


Figure 6. Northern Nguni dance staffs,19th century, Wood 74.5 cm - 78 cm (*The art of Southeast Africa* 2002:118)

The designs went through two iterations, the first set of models (Figure 7) being rejected because the formal features of each resembled too closely those of the Nguni staff heads that inspired them. Also, their handles were too thin, lacking the robustness that characterises much traditional African art.

[10] Educator Mark Smith explains the use of the term praxis by educators such as Paulo Friere (in Pedagogy of the Oppressed.1972) and Shirley Grundy (in Curriculum: Product or praxis.1987) to describe the interdependency of areas of knowledge once considered disconnected (for instance, Aristotle's threefold distinction of knowledge into theoretical, practical and productive areas) so that 'There is a continual interplay between ends and means ...a continual interplay between thought and action... [involving]... interpretation, understanding and application in 'one unified process' (Gadamer 1979: 275).' (Smith 1999:online)

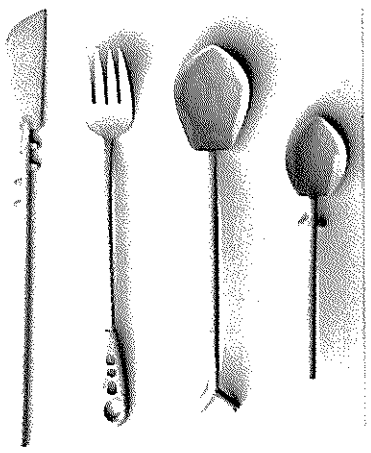


Figure 7. Developmental cutlery

In the second version of this set the handles have been integrated with bowl (of spoon and teaspoon), blade (of knife) and palm[11] (of fork) respectively to accentuate and transform some of the inspirational features from which they have been sourced. For instance, the spoon and the teaspoon no longer look like staffs but have a twig and leaf like quality, even though the ridges on their undersides (Figure 8) are inspired by the heads of the Nguni dance staffs (Figure 9).

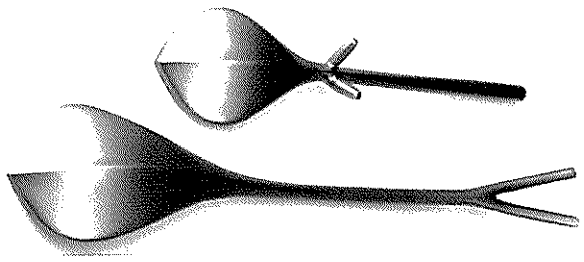


Figure 8. Underside of cutlery showing ridges and feet details

[11] I have coined this term in the absence of any authoritative source naming the flattened part of the fork between the handle and the tines. This flattened blade is visually analogous with the palm of a hand, the tines forming the fingers. It would be difficult, without naming this part, to describe the position of the features that are attached to it.

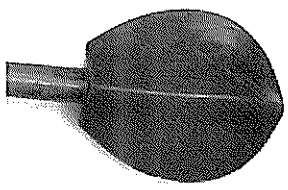


Figure 9. The ridge on the Northern Nguni dance staff head (detail from Figure 6) is the basis for the ridge on the undersides of the spoon and teaspoon. Similarly, the feet on the Northern Nguni snuff kerrie (Figure 10, nest) are the basis for the feet on the teaspoon.

This ridge has been echoed as a valley on the upper sides of the spoon and teaspoon. The forked legs on the end of the handle of the spoon prevent it from tipping to one side, something the ridge would otherwise cause it to do. The legs struck me as the type of zoomorphic solution that many African craftsmen would use to solve this problem (Figure 10), so the same strategy is used on the teaspoon.

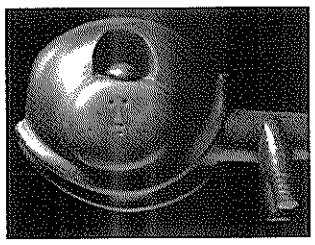


Figure 10. Northern Nguni snuff kerrie, detail of head. 19th century, Wood. H. 13 cm.; L. 61.5 cm (The art of Southeast Africa 2002:83).

In the teaspoon the placement and shape of the feet are influenced by the feet on the Northern Nguni snuff kerrie (Figure 11).

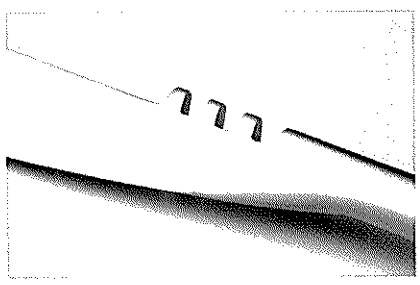


Figure 11. The influence of the Northern Nguni dance staff head on the knife.

When the second version of the knife was taking shape its handle resembled the bone of an animal, a natural material often used by traditional African artists in jewellery, combs and other objects. The resemblance to bone is then carried through to all the handles of the cutlery set. The shape of the blade of the knife and the squared teeth behind the blade are inspired by the shapes on the head of the Northern Nguni staff (Figure 12).

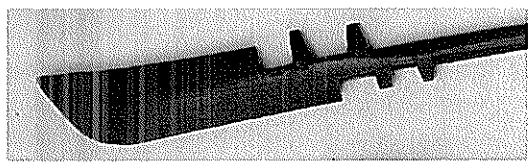


Figure 12. Northern Nguni dance staff head (detail from fig. 6) 19th century, Wood. H. 13 cm.; L. 61.5 cm (The art of Southeast Africa 2002:83)

The teeth on both suggest the serrations on knives. The decorative triangulated spines on the fork (Figure 13) have no specific inspirational origin, but take their cue from the widespread use of the triangle as a motif on objects of traditional African art.

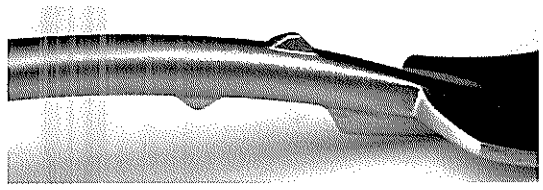


Figure 13. Fork detail showing triangulated spines

The protuberances of the Northern Nguni sweat scraper (Figure 14) and the decorative motifs carved on the sides of the Zulu neckrest (Figure 15) are just two of many examples.

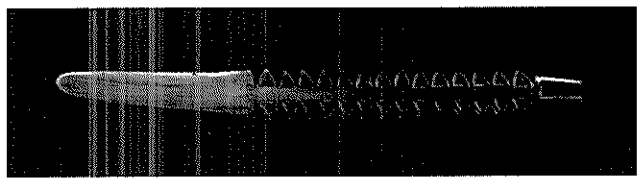


Figure 14. Northern Nguni sweat scraper. 19th century, Horn H. 32 cm.; W. 3 cm (The art of Southeast Africa 2002:146)

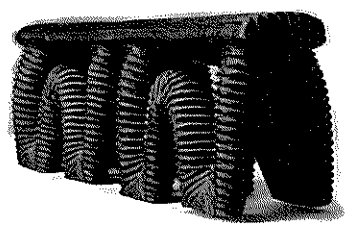


Figure 15. Swazi neckrest. 19th century, Wood
H. 16.5 cm.; W. 41.5 cm (The art of Southeast Africa 2002:165)

Strategy two: contemporary African crafts

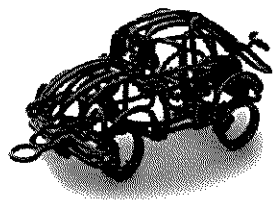


Figure 16. Copper wire miniature of VW Beetle.
H. 3.8 cm L.8 cm

This second strategy celebrates the resourcefulness and inventiveness of the many African craftspersons who set up operations of manufacture and merchandising together, along the sides of roads, next to shopping centres, in flea markets, or wherever else they deem suitable. Much of their work reinterprets Western products by caricaturing them in miniature form (Figure 16), and much of it simply recognizes the gaze of the tourist in its production of iconic figures by which Africa can be characterised and remembered (Figure 17).

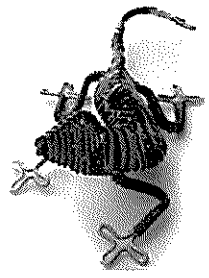


Figure 17. Recycled aluminium and galvanized wire gecko L.16 cm

Their work succeeds at being either functional or sculptural using the most elementary of mass manufactured materials,

SOCIAL MOBILES AND SPEAKING CHAIRS: APPLYING CRITICAL DESIGN TO DISRUPTION, DISCOURSE AND DISABILITY

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Abstract

The role of critical design is to ask questions rather than to propose solutions. It is being applied to different issues relating to disorder and used to provoke discourse. Provocation is valuable because thinking may be stifled by the overwhelming complexity or sensitivity of such issues; questions are appropriate because simple solutions are unlikely in these contexts. Two examples are described and compared:

Social Mobiles applied critical design to the disruption caused by people using mobile phones in public places, to the disorder arising from the side-effects of this technology. It did this through five extreme concept phones, each of which modified its user's behaviour to make it less socially disruptive. This challenged the perspective of user-centred design by prioritising the people around the user for a change, a fresh perspective within an industry obsessed with self-expression. Social Mobiles successfully generated international publicity and cross-cultural debate and the extent to which this publicity has translated into discernable influence is discussed.

Speaking Chairs is applying critical design to communication aids for people with speech and language impairment, 'disorders' affecting their discourse with others. This is an area in which thinking has been inhibited by the genuine sensitivity of the issues surrounding disability. But current assistive devices are themselves not a neutral technology: a lack of emotion in Text-To-Speech technology can give listeners a false impression that the person using it is not only speech-impaired but also emotionally or even cognitively impaired. This project is exploring radically different ways to control not only what is said, but how this is said - the intonation and prosody of the generated speech. In order to be more provocative, working prototypes will be built not as conventional devices, but as chairs, which also opens up new questions for interaction design and social interaction.

Critical design has to strike an interesting balance. Obvious exaggeration and over-simplification can be employed to signal the limited role that design can play and to acknowledge that design is never enough on its own, given the complexity of a social and cultural, even economic and political context. Yet the discussion that a memorable piece can provoke underlines the serious intent behind this apparent levity. And at the same time, using design to give an iconic presence to an intangible issue serves to remind designers and non-designers alike that design and design thinking could be playing a wider and more influential role.

Critical design

Increasingly within research, design is valued not just for addressing or solving problems, but also for its role in making issues visible and tangible, and thereby facilitating discussion and reflection.

One emerging approach is 'critical design' which uses provocative designs to challenge conventional wisdoms of the future path of technical development. It has been applied to many profound social issues and successfully seeded new discussions. Critical design has been described as "design that asks carefully crafted questions and makes us think" rather than "design that solves problems or finds answers" [5]. This is clearly in opposition to some traditional, more technical definitions, in which design is considered synonymous with 'problem solving'.

A defining example of critical design was the 'Placebo project' [5] in which Dunne and Raby devised and built a series of eight prototype objects, each of which in some way gave a visual presence to invisible, ambient electromagnetic radiation. The products were placed with members of the public, who 'adopted' them, with the purpose of eliciting reflections on their function and thereby underlying perceptions of and beliefs about electromagnetic fields. And since a lot of ambient radiation is directly or indirectly created by electronic products, these reflections illuminated wider issues of the cumulative effect of relentless product development.

As the creators of Placebo state "Designers cannot always solve problems, we cannot switch off the vast electromagnetic networks surrounding us all. Although we cannot change reality, we can change people's perceptions of it." Hence the title 'Placebo': like a medical placebo, the objects do not actually have any direct effect on the cause for concern, but by providing psychological comfort may produce changes in behavior and even outcome nonetheless. This is at once a more pragmatic and more ambitious role for design. Influence may be less tangible than direct intervention, but more profound.

Disorder and discourse

The many meanings of the word 'disorder' include a diversity of issues that are also too large for design to 'solve'. Whether the disorder is social or clinical, applying to a population or an individual, it implies a complexity of issues in which any designed intervention is just one piece in the jigsaw. Often a small piece.

We will consider two instances of 'disorder', one social, one clinical, in which design has or is being employed for reasons other than to solve any problem directly. We will then compare and contrast the role of design and question whether the existing term 'critical design' can comfortably accommodate both.

Social Mobiles

The first project was inspired by the anger and frustration caused by other people's mobile phones. Conceived at a time when mobile phone use in Britain was reaching a level of ubiquity such that everyone's experiences of public spaces was coloured by inconsiderate use of mobile phones. People holding annoyingly one-sided conversations that lasted an entire bus journey; irritating ring-tones going off in cinemas and art galleries.

Social Mobiles [7,15,18] consisted of five extreme mobile phones, each of which changed its user's behaviour to make it less socially disruptive. The first phone in the series, 'the Electric Shock Mobile', delivered an electric shock through steel plates on the sides of the phone. The level of shock, from mild tingling to painful jolt, was in proportion to how loud the person on the other end of the phone was speaking. This feedback loop had a dangerous instability to it: if one person spoke loudly, the other might be hurt and yell with the pain, inducing an even bigger shock in return... In this way, both parties were scared into whispering.

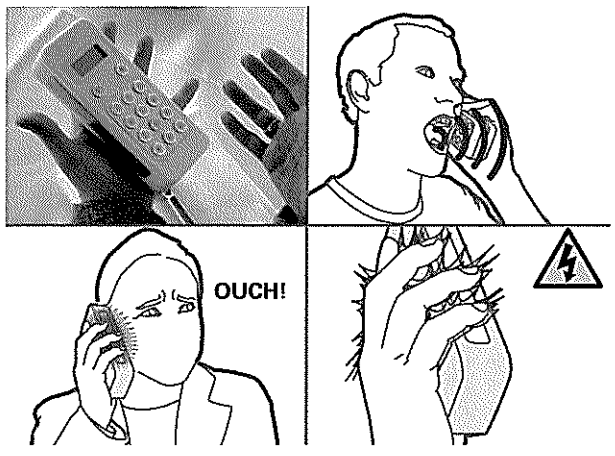


Figure 1. The Electric Shock Mobile in use

The third phone in the series was 'the Musical Mobile'. This was an oversized phone that must be played to dial a number. Ridiculous, but in many ways an elegant solution to the problem, it brings the moment of disrupting other people forwards to the act of dialling, before the caller is immersed in their telephone conversation and so often truly oblivious to those around them. How the user feels about this public performance acts as a Litmus Test for how appropriate it would be to make a call.

There were three media through which the project was largely

disseminated: a booklet that was sent out to journalists to attract interviews; a website accessible to press, public and industry alike; working prototypes of the phones that could be experienced at IDEO's office and which were also loaned out to exhibitions. The combination of all three led to articles being written internationally, from The Economist to Wired, and to radio and television interviews. In The Independent, David Redhead [14] contrasted the Social Mobiles with Motorola's concurrent exhibition, 'Mobile', which traced the development of its mobile phones from military handset radios to the smallest and lightest phones of 2002. Redhead concluded that their "rose-tinted vision of the mobile doesn't quite chime with the way we feel". Tom Standage [16] wrote about the project in The Economist, commenting the hope to provoke discussion seemed to be working, the project just having won an award from the Agency of Cultural Affairs in Japan, "perhaps the country where both social etiquette and mobile phones are taken more seriously than anywhere else." The scenarios had been carefully placed in a London context, to acknowledge the perspective of the design team and knowing that the social issues would play out differently in different cultures. What was so interesting then was the resonance with a Japanese audience, both with the issues but also the humour with which they were communicated. The exhibition in Tokyo to accompany the award attracted a lot of public interest and TV coverage.

The extent to which the project had a lasting impact is more difficult to prove, but two years later, IDEO were designing the 'Simply' phone for Vodafone customers in their 30s, 40s and 50s. The issue of phone etiquette is important for people in this age group and the Vodafone team have acknowledged that, alongside the usual observations of real people in this group, the Social Mobiles project helped keep phone etiquette visible throughout the Simply project by giving it such an iconic presence. Many people in this age group fear their phone behaving inappropriately in public by ringing out loud, yet the controls to mute the phone are often hidden or obscure to them. On the Simply phone therefore, switching the phone to silent was brought out in a direct, physical control on the side of the phone, as was locking the keypad. Vodafone hope that by addressing etiquette, more of their users will keep their phones switched on (and contributing to revenue generating network activity), rather than leaving them switched them off (and inactive). An interesting path from critical design to commercial interests then, but not one that contradicts the spirit of the project.

The role of the series

One aspect that the Placebo and Social Mobiles projects have in common is that they both involved a series of objects: eight pieces of furniture; five mobile phones. The benefit of this is that the focus becomes the body of issues addressed rather than any one of the objects. A single object might be misconceived as a direct solution to a problem, whereas a series of contrasting and even contradictory responses facilitates reflection on broader issues.

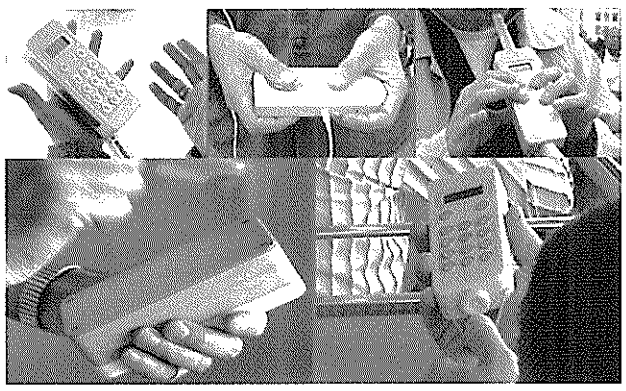


Figure 2. The five Social Mobiles

Had the Social Mobiles project consisted just of the Electric Shock Mobile, for example, more of the resulting discussion would have focussed on punishment and thereby on legislation than on consideration and social interaction. Its particular role, its 'shock value', was more to attract attention to the series as a whole.

Another common approach was to build 'working' prototypes of the objects. At least 'working' in the sense that people believe them to be working: experience prototypes [2]. Using and experiencing an object promotes a different reflection than contemplating a model from afar.

Both Placebo and Social Mobiles also involved photographing the objects in context: in Placebo in the context of their adopted homes; in Social Mobiles in the context of Londoners on foot, bus or train, in restaurants or galleries. In both cases this

reinforced the limited role of traditional design: emphasizing the people and often the 'undesigned' environment in which the products lived.

Discourse and disability

Another meaning of 'disorder' is in connection with disability. There is understandably and rightly much sensitivity around disability, given the exclusion, both physical and social, still experienced by so many people with disabilities.

Many assumptions relating to design and disability go unchallenged [11,12,13]. Many arise from stereotypes of a group of people every bit as diverse as the population as a whole. For example, that discretion is always the priority in design for disability, above any other criterion, leading to a dominance of pink plastic medical devices, such as hearing aids, that may in fact imply shame by attempting to conceal themselves.

The 'HearWear' project [17,19] sponsored by the Royal National Institute for Deaf people (RNID) and Blueprint magazine, and exhibited in the Victoria and Albert Museum, London, invited a diversity of designers to approach hearing technology from new perspectives. More projects like this would be welcome, using design to provoke discussion and changes in attitude, rather than to directly propose solutions.

The issues surrounding disability and underlying social attitudes towards it deserve to be taken seriously enough to risk the provocation that critical design might produce.

Speaking Chairs

The second project we will consider in detail concerns speech and language impairments, 'disorders' that can affect a person's ability to communicate with other people.

Here, after centuries of diverse technological development, ranging from mechanical devices played as musical instruments [8] to electronic interfaces in which sounds can described by painting lines with a brush [3], the dominant technology today is Text-To-Speech (TTS) [6]. Hand-in-hand have come interfaces that are based on written rather than spoken language, as a result of which prosody, voice quality and those utterances not transcribed in text are underrepresented.

The group of people most affected by this technical limitation are people who rely on communication aids to converse with others. A lack of emotional expressiveness in speech generated by communication aids can give other people a false impression that the person is emotionally and even cognitively impaired as well [1].

But people with speech impairments are often affected by more general motor impairment, and so a user interface that demanded good manual dexterity might be impractical to use. For example, many will access text not through a QWERTY keyboard, but via a smaller number of switches or options at a time. They may also have a deeper language impairment, whether as a cause or a symptom of their physical inability to speak. The net result of these profound challenges is that the field of communication aids are largely working within the constraints of TTS technology, rather than pushing its boundaries.

The Speaking Chairs project is the first phase of an exploration of radical new interactions with speech technology. It uses designed artefacts to explore new ways in which people might control the 'tone of voice' of synthesised speech. The chairs are inspired by a diversity of existing perspectives on spoken language from different disciplines: phonetics, linguistics, psychology and music. Each chair is a physical representation of a mental model, translating it into a user interface.

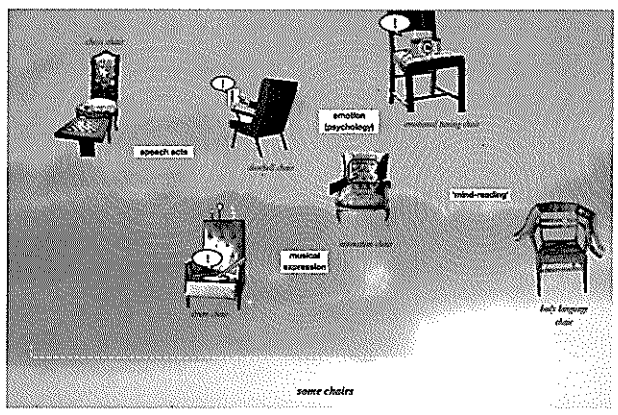


Figure 3. some Speaking Chairs

Working models will be built and experienced, illuminating the relative merits and shortcomings of these diverse principles in the context of live conversation. In this way, the possible future application of these new approaches to give speech-impaired people the opportunity to express themselves through 'tone of voice' will begin to be explored.

The chairs are not be taken literally as designs for communication aids, rather they are illustrative of the principles on which future communication aids could be based. In many ways, the choice of chairs as the bases for these objects is arbitrary, but there are some advantages in choosing chairs: chairs support face-to-face communication without coming between the people talking; the scale of a chair allows computer technology and electronics to be hidden within it; chairs are more surprising in this context and so less likely to be taken literally than more conventional boxes.

This project is very much work in progress and will be presented in full at future conferences.

Prototypes, models and genotypes

What Social Mobiles and the Speaking Chairs have in common is that design is being used to visualize issues that otherwise might go unseen and undiscussed.

The Social Mobiles are oversized phones; the Speaking Chairs are anything but the boxed, electronic products normally expected. Yet their role is both to have visible presence, yet to downplay the role of purely visual design in this context. In both cases, the extreme appearance is aiming to be memorable, but representative of the interaction and behaviour.

On reflection, the role of critical design is different in these two projects. Where they differ is that the Social Mobiles, perhaps with the exception of the Knocking Mobile, were not intended as even embryonic solutions to the problem of anti-social phone use. Whereas the Speaking Chairs are being more open-mindedly conceived in the hope one or more of the chairs may form the basis for a usable and effective interface for people with speech and language.

Perhaps then the term 'critical design' is inappropriate to the Speaking Chairs? They are somewhat more optimistic. Yet returning to terms such as 'conceptual design' or 'experimental design' does not express the illustrative role of the chairs, in making visible and tangible and interactive, mental models of expressive speech. Conversely, the adjective 'illustrative' or 'diagrammatic' does not convey the exploratory intent, implying a representation of something existing. Dunne and Raby, in introducing critical design, mention the related terms 'haute couture', 'concept cars', 'design propaganda' or 'visions of the future'. None of these seem any closer.

At design consultancies such as IDEO [9], where prototypes are a valuable but often costly part of the design process, it is very important that the role and scope of any prototype is not misunderstood by a client. After all, 'prototype' can be applied to a vast range of objects, from non-functioning sketch models, proof-of-principle technical rigs and full pre-production prototypes which may me indistinguishable form the finished product. Half an hour into a meeting that everyone thought was converging on mutual understanding and agreement, a client leaned over an early blue foam model of a product and commented that they didn't like the colour and, digging their fingernail into the surface, that it wasn't nearly robust enough for use in hospitals. Most designers will have experienced something similar.

In this context, the author and others developed a very simple, very explicit nomenclature: we spoke of 'looks like' prototypes (visual models), 'works like' prototypes' (technical demonstrators) and 'looks likeworks like' prototypes (full, working prototypes). Later, with the advent of 'experience prototyping' [2], in which the interactivity may be prioritised over the final graphical appearance, the vocabulary was broadened to include 'behaves like'. 'Feels like' was added to denote the use of final materials rather than painted surfaces; 'functions like' to denote the final technology being employed, with all its limitations, rather than simulated.

But this vocabulary was nevertheless usually applied to a fairly conventional development process, in which progress towards a solution to a problem was being gauged and assessed. The role of critical design and associated techniques is less direct and even more open to misinterpretation.

Perhaps a term is needed that combines the exploration of a landscape of different approaches, along with the visual representation of landmarks in this landscape. Dunne [4] has also described the distinction between 'the design object as prototype', 'as installation', 'as model', and 'as prop'. A summary of my understanding of his much deeper description is that a 'prototype' is a working device, ready for manufacture or at least implying this readiness; an 'installation' involves a more legible relationship to a gallery and a design conceived specifically for this context; a 'prop' refers an object seeded into a film or other medium and experienced through this medium; a 'model', here implying a non-working model, may not be so directly representative of a fully-developed design, more illustrative of the essence of a design idea. The word 'genotype' is also used as an equivalent.

In this classification, the Speaking Chairs might be considered 'working models', or even 'working genotypes'. They definitely seek to illustrate and represent the essence of an idea for an interface, rather than anything even approaching its final format, its principles rather than its execution. But at the same time these chairs are interactive and can be experienced not just contemplated. The author welcomes hearing about other classifications and precedents in this area that might help determine whether this approach is after all part of an established tradition, or whether another new expression or hybrid might even be appropriate.

Conclusions

Design has a role to play in visualising and therefore provoking discussion about disorder, in its many complex forms. Provocation is valuable because thinking may be stifled by the overwhelming complexity or sensitivity of such issues; questions are appropriate because simple solutions are unlikely in these contexts.

Critical design is a recognised methodology in which design is used to ask questions rather than to directly propose solutions. But there are other design approaches between these two extremes and a richer, shared vocabulary of the different roles of design in this area would be valuable.

Acknowledgements

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NAQQAL'S GIFTS: THE AFFECTS OF EXTERNAL DYNAMICS ON COMPUTER GAMES

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Abstract

Oral story traditions are one of the oldest forms of interactive entertainment. The interaction between the audience and the story-teller is a limited form of interpersonal communication and is regulated by the internal dynamics of an interaction system called "open form". It is not uncommon for the audience and the story-teller to try to influence the storytelling process by other external dynamics, such as gifts and money. As one of the newest interactive entertainment systems, computer games are based on an interaction between the player and the game system regulated by rules. Like the "open form", these rules can be broken by several types of computer game cheating. It is interesting however to see the similarities of methods and objectives in these interactive systems from different centuries. Audiences and players are seeking the same kind control over the system which can lead to new experiences or destroy the system.

Internal and External Dynamics of Audience Participation in Oral Tradition

Umberto Eco's "mobile artwork" is one of the earliest conceptualizations of "interactive" art. According to Eco an artwork after Einstein physics can no more be stable and solid as an artist's creation; or in other words be closed. He suggests that artworks will be open to audience participation and influence, and therefore in the next phase become mobile. Mobile artworks consist of unfinished artistic pieces that the artist exposed to the audience and take their shape with interference of the receiver. In this process, it is aimed that the receiver participated to the text as interpreter (Eco, 2001, p: 151). He gives examples of contemporary painters and sculptors like Munari and Calder as artists with mobile artworks and claims that the mobility can (or will) be occurred in the field of narration and gives the example of Mallarme's experimental (and unfinished) 19th century project "Grand Oeuvre" (The Grand Masterpiece) or "Le Livre" (The Book). In "Le Livre", the pages were not supposed to be in any order; groups were formed with a permutation system. Separate fascicles should be ordered randomly and each order is supposed to be meaningful. Mobile and shifting sheets in fascicles enable every possible permutation[1] (Eco, 2001, p: 22).

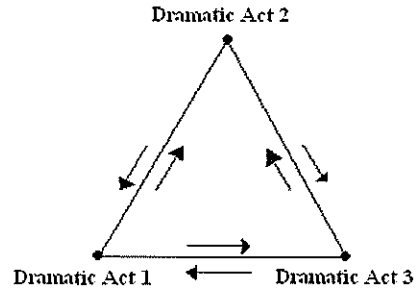


Figure 1. In this basic mobile model, organising the sheets containing dramatic acts in any order should give a proper meaning.

[1] A later experimental narrative project with a similar mobile model is the movie "Lan Yue" (1997) by director Ko Yi-Cheng.

Based on the theories of Eco, Metin And uses the term "open form" to explain the interactive relation of the audience to the narrative text in traditional Turkish theatre. In "open form" the audience does not interact with the text directly, but interacts with it through the actors or puppeteers.

Traditional Turkish theatre plays (Karagöz the shadow puppetry and Ortaoyunu) is structured basically in 4 acts: The prologue (öndeyiş), the converse (söyleşme), the chapter (fasıl) and the final (bitiş). These acts follow the same order in each play but their content and length can be changed. Some of these changes planned by the actors/puppeteers before the play according to both their audience profile (funnier themes for children, erotic themes for male adults etc.) and to the time (i.e. during a religious festival) as well as place of the play (i.e. a big city or a little village).

The audience can also interact with the narrative text during the play. Here occurs an interpersonal interaction in emotional level which affects both the audience and the actors and also the narrative text. Emotional responses to the play (and the actor) such as applause or laughter of the audience are the key elements for interactive narration process. Metin And assumes that, 'when supported by the audience with emotion waves, the actor or the puppeteer regains good humour, extends the converse, adds support characters to the play and prepares a revel show with dancers and acrobats' (And, 1985, p: 422).

Although it is a new narrative experience; the new narrative structure created through the "open form" interaction is actually not a new dramatic act. It is an extended version of the original dramatic act of the play. While the original story remains, additional side-stories are integrated into it (And, 1985, p: 423).

"Open form" interaction can also be found in other Middle Eastern oral traditions. In "Naqqali" (dramatic story-telling) tradition in Iran; story-tellers called "Naqqal"[2] use dramatic expressions such as acting, dialogue, singing and dramatic gestures to perform stories based on epic, historical or religious texts. One of the basic texts used by Naqqals is the Persian epic Shahname by Ferdowsi. 'Each naqqali has a prompt book, a tumar, a compressed synopsis of the Shahname to help them remember the story. These are prose summaries of the story and tellers use them to weave their own variations, poems, songs and side stories into the plot' (Clayton, 2005). Although very similar to the Turkish "open form", Naqqali tradition based on written texts may not always be interactive. Bolukbâsh (Cultural Tradition in Iran (n.d.)) divides the Naqqals in two groups, according to the manner of storytelling:

1) The Naqqals who read the stories from the books and then interpreted and expound them while sitting before the audience;
2) Those who recount the stories by heart and their story-telling are dramatic, because it is performed together with this or that element of dramatic expression.

Yet even so, according to Clayton (2005), the written text is even today a product of performance:

> In Persian culture there is a fluid relationship between written and oral modes of communication. Storytellers draw on written versions of Shahaname then recreate the text in performance, composing and improvising new poetic sections, which then get added back into the written text. So the text is in progress, constantly being remade by each teller, the storyteller preserving, transmitting, recomposing, and inventing the text in performance.

Traditional Turkish story-tellers, "Ozans" also use "open form" in their performances. A traditional story performance starts with a musical section called "fasıl" followed by a playful formula called "döşeme". Both these sections can be changed by Ozans according to the wishes and responses of the audience. Traditional stories Ozans tell are combinations of verse and prose parts. Ozans are allowed to add side stories called "karavelli" to the main prose story arc without breaking the main dramatic structure. Yet in the Turkish story-telling tradition Ozans are not allowed to change the verse parts. According to Boratav (2002, p: 33), if the audience notices an Ozan changing the verse parts of the story, they protest and criticize him.

[2] "Naqqal" can be directly translated in English as "transmitter", the one who transmits the tale. (Clayton, 2005)

In "Open form" story-telling main dramatic structure is always preserved by the story-teller. Additional songs, poetry, jokes or side stories are created by the emotional interaction during the process. We can say that "open form" is a combination of story-teller, audience interaction and non-interactive story-telling.

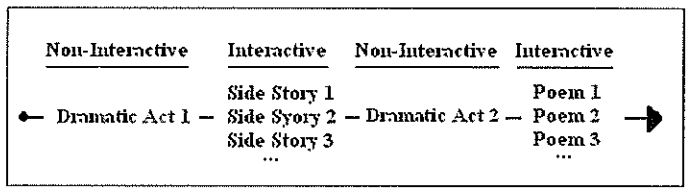


Figure 2. "Open form" is a combination of interactive and non interactive story-telling

"Open form" story-telling model seen above can be compared with the low-level interactive narration models created for computer games. In one of these models Rouse (2001, p: 216) divides the story structure of a computer game into two segments; "designers' story" and the "players' story". Designers' story defines a linear story around the playable parts of a computer game; mostly told in cut-scenes. Designers' story is very similar to the unchangeable dramatic structure in "open form". "Players' story" on the other hand means the interactive action sequences in a game. In these sections the player interacts with the game-world using different tactics; items etc. and resultantly experiences each time a different series of event.

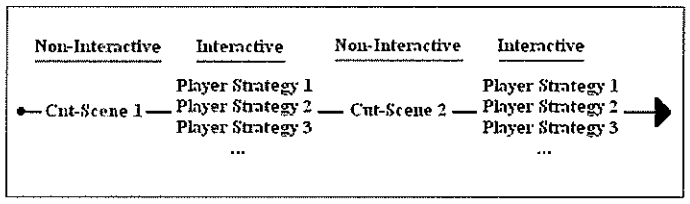


Figure 3. "Designers' - players' story" model is very similar to the "open form" model

As the "players' story", the dramatic interaction sections in oral story-telling traditions are parts of the interactive process. We use the term "interactive" from the perspective of communication studies here. Interaction refers to two equal and mutually active sides of communication. Namely in oral story-telling the audience and the story-teller are equal sides; therefore their dramatic affection from each other and the change in the story-world is a natural and internal outcome of the process.

Cailois' (1961, p: 6 - 7) definition of playing can help to understand the interaction in oral story-telling and the concept of internal dynamics better. "The activity of playing takes place usually within the boundaries between specific time and place: playing starts with a signal and ends with one. In an ideal situation, events outside the playing field do not affect the playing". Like the activity of playing, oral story-telling takes place within the boundaries between specific time and place, and normally only the emotional interaction during the process affects both sides and the story. Yet this is not always the case.

As well as internal dynamics, external dynamics are a part of the oral story-telling tradition. These dynamics occur between the story-teller and the audience outside the dramatic-emotional interaction level and create a new level of interaction. Some of them are natural results of the nature of the story-telling process.

Naqqals tell their epic stories in 90 minute length sections, often one episode each day, the tales are left on a cliff-hanger each time; normally it would take them 6 months to complete the Shahname. Sometimes the audience begs the naqqal to continue and offer gifts or money to him (Clayton, 2005).

In Turkish tradition Ozans also tell their stories mostly in more than one night, and even in one night, there are two or more sessions. The session after a break starts with a musical performance. During the performance the Ozan asks the audience where he has left the story. Traditionally the Ozan himself has to answer the question. If someone else gives the answer, the Ozan stops playing and the one who gave the answer has to pay him to continue. It is also not uncommon for the Ozans to prolong the musical performance and force rich members of the audience to answer his question and pay for that (Boratav, 2002, p: 33 - 34).

In the first example, we see how the audience uses an external matter/dynamic to force the story-teller to continue

the emotional – interaction and the dramatic experience.[3] It is a way for the audience to speed up the story-experience. In the second example, the story-teller uses this will to gain money and breaks the interaction between himself and the audience. From the interactive-story structure perspective, in the second example the story-teller does not respond to the audience's emotional-will to continue the story until he receives an external factor from the audience. Although a part of the tradition, these examples create a disturbance on the "open form" of the story.

Another and much powerful type of external dynamic, affecting the oral story-telling tradition results, is not only changing the interactive parts of the "open form", but also creates a new dramatic structure and a chain of events and also a new ending for the story. As we have seen above, traditional story-tellers make arrangements in their stories before their performances in respect of their audience profile, time and place. Yet sometimes regulating side stories may not be enough to please the audience, especially in tragic and sadly ending stories. Offering Naqqals gifts such as animals or money to keep a dying hero alive is a widespread behaviour (And, 1985, 223). In the Turkish tradition both offering gifts or money to the story-teller but also threating his life to keep a hero alive is heard of. One of the most notable examples for such actions is the general agreement of story-tellers in Kars area in 1800s. According to Boratav (2002, p: 69), the story-tellers decided in this agreement not to tell the sadly-ending of stories, instead create new happy endings to avoid threats of the audience. Since then the stories in Kars area has happy endings with the exception of "Kerem and Aslı" story, which is told very seldom in the area.

A very interesting and rare record in "Güldeste-i Riyaz-i İrfan" from 1602 shows how an external dynamic can destroy the whole story-telling process. According to this record quoted by Boratav (2002, p: 68), during a story meeting in Bursa a group in the audience supports a hero while another group supports the other one. The situation becomes so tense that the meeting ends with a fight.

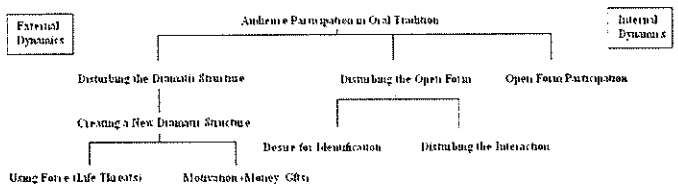


Figure 4. Audience Participation types in Oral Tradition.

A non-interactive narrative text is closed to the participation of the audience. In the oral story-telling tradition the "open form" provides a limited interaction in the emotional-level, which is an internal dynamic of the process. External dynamics in the oral tradition can be separated into two groups; the ones which disturb the "open form" and the ones which disturb the dramatic structure and create a new one. Internal dynamics create non-obligatory results but external ones have a directing affect on the process and on both sides.

External Dynamics in Computer Games – Cheats and More

Computer games as designed interactive worlds have a similar relation to the one between the story-teller and the audience in oral tradition, to the game player from the perspective of internal and external dynamics. Game mechanics and interactive interfaces create the internal dynamics for the game player to interact with. In addition to this, the concept of game is important for understanding the definition of internal and external dynamics in computer games.

According to Huizinga (1995, p: 48), game is a voluntary action which is dependent on both temporal and spatial limitations as well as willingly accepted rules (game mechanics). Juul (2005, p: 12) describes computer games as a combination of rules and fiction. In this dual structure 'Rules describe what players

[3] This kind of mental connection to the narrative text is a result of mental identification. This is also similar to the "immersion" process in computer games. An immersive computer game creates an environment for the player where she/he feels her/himself surrounded by it or in other worlds as a part of it. An immersive and interactive environment might create a deeper level of mental identification. Immersing in a game environment indicates to be engaged, not just physically, but also mentally and emotionally. It requires active participation of the player.

can and cannot do, and what should happen in response to player actions' (Juul, 2005, p: 56).

Rules are the internal dynamics of a game and create order in a game world and disturbing the rules is often described as destructive. 'There is a peculiar and absolute order in the game world. Game creates a system; it is a system by itself. It creates a temporary and limited perfection within the complexity of real world. It requires an absolute system. Even a small-scale violation of this system ruins the game, destructs its whole quality' (Huizinga, 1995, p: 27). In "Homo Ludens", Huizinga (1995, p: 28-29) quotes from Paul Valéry; '...no scepticism is possible where the rules of a game are concerned... indeed, as soon as the rules are transgressed, the whole play-world collapses.'

Although game world is a closed structure where the game mechanics define the interaction processes, it is not uncommon for the players to break these rules or "cheat". Computer game cheating is defined by Yan and Choi (2002) as; 'Any behaviour that a player may use to get an unfair advantage, or achieve a target that he is not suppose to is cheating. ' Kuecklich (2004, p: 2) emphasizes the connection between rules and cheats and says that most cheats '...give the player an advantage that the rules of the game do not allow for'. There are various definitions and perceptions of cheating in digital games. But we can still distinguish what cheating is, using Consalvo's (Bedigian, n.a.) easy but effective definition: 'Cheating is like porn – hard to define but we know when we see it.'

Technically there are three main types of cheating. The first group called "cheat codes" are actually semi-official codes created by game designers and are hidden in the game-code to trigger extra abilities for the player when activated. These abilities are hidden features of the game but are not a part of the official game-mechanics itself. The second group is the strategy guides and walkthroughs. These are solutions for game obstacles written by players, game critics or by the design company itself. Strategy guides and walkthroughs can be found on the Internet or are published and sold as books. The third type of cheating is hacking the game software. This can be done either by changing the game code itself or writing additional software. A forth type can be using the holes in the game mechanics or interfaces to cheat.

There are different levels of cheating for computer game players. While some players see the cheating techniques listed above acceptable and even positive, for some they are firmly unacceptable and negative. Consalvo (2005, p: 2 - 3) presents three different perspectives on the perception of cheating by gamers:

- "Purist" Perspective: Purists see anything else than a solo effort is cheating. 'This group sees strategy guides, walkthroughs, cheat codes and hacking as all being cheating.'

- "Code is Law" Perspective: 'This second group doesn't see the use of items like walkthroughs and guides as cheating, but they draw the line at cheat codes and hacking codes. Here also people accept the possibility of cheating in single-player games, where the manipulation of code for its own sake can be enough to draw the line.'

- "You can only cheat another player" Perspective: 'The third group defines cheating as only existing in relation to another player. For this group, code is also the key to cheating; is not the mere use of code, but its use for the purpose of deceiving others.'

For the "Purists" perspective every external influence towards the game is cheating. "Code is Law" perspective on the other hand is rather a technical criterion as "You can only cheat another player" perspective is a social one.

Julian Kuecklich (2004, p: 2 - 3) classifies cheats in digital games in three different categories. These are platform, game mode and genre. Platform refers to the hardwares such as PC, console and arcade games. For example, PC games allow access to the game files (which allows hacking), on the other hand console and arcade games do not offer this kind of an access. Second term, game mode indicates the differences between single-player games, "closed" multiplayer games and "open" multiplayer games. The major difference between game modes is that cheating in single-player games affects only the person playing the game while in multiplayer games it causes a huge conflict. Kuecklich's third category is genre. Computer game genres can be explained as a triangular matrix, according to their levels of narrativity, interactivity and openness. In this

model, interactivity refers to the frequency of the players' physical interaction with the game. Openness indicates the range of actions the players can choose from. According to this triangular matrix Kuecklich presents three genre-specific cheats; cheats that speed up narrative progression, cheats that increase the player's frequency of interaction and cheats that enhance the possibilities of the player's options.

The first two of Kuecklichs' classifications are like Consalvos' perspectives have technical and social bases. The third classification where the "genre" refers much more on the game play dynamics.

Typical effects of cheating on the game play can be listed as "invulnerability" which makes the player character invulnerable to damage, "invisibility" which makes the enemies not to see the player character, "flying" which makes the player character pass through walls or objects, "infinite resources" which gives the player an infinite amount of some resources, "unlocking items and characters" which unlocks hidden items or unused content in the game, and there are some other cheats giving the player additional to weapons or inventory items. As a common way of cheating walkthroughs are according to Neitzel (2005, p: 234) like '...a recipe for creating the ideal story, in other words, an instruction for actions'.

Various perceptions of cheating differentiate the approaches to it. There are varied interpretations which present the cheats as both a contribution to game experience and a sabotage for fun acquired through game play. In other words, both positive and negative aspects of cheating can be found.

When the player gets stuck in a game, cheats allow her/him back into the game. In this situation, the players make an instrumental move to keep game play. For instance, with the help of walkthroughs the player can pass the phase which causes him to quit and after that he/she can continue to play. This move may not cover the whole, but the level which the player cannot figure out how to pass (Consalvo, 2005, p: 4). Therefore, it is relatively acceptable.

Cheating is a way to slip out from limitations of the game world and creates a new experience. Kuecklich (2004, p: 2) claims that cheats seem to have only one thing in common: they change the way players experience the game. Cheating is not destructive all the time. It builds new experience opportunities. Consalvo (2005, p: 7) sees cheating not as a subversive concept; it's a way for players to keep playing through boredom and infertile scenarios.

Cheats increase re-playability of a game. Cheat codes allow people to play in multiple ways. Different cheat codes draw new ways to follow. Each path provides a new experience. Trying different opportunities brings re-playability of the game product. According to Juul (2005, p: 199), '...the proliferation of semi-official cheat codes has made it possible for players to bend the rules of video games to accommodate their own wishes'.

Cheats allow the player to just walk around and observe the game universe. Some people, -especially fans- don't want to beat the game, but they just want to walk around (Bedigian, n.d.) and watch the design elements such as ship models, costumes of game characters, weapon types or experiencing the atmosphere of the game.

Cheats create a network through web-forums, game magazines and online walkthroughs etc. Cheats are a part of game genres. A game includes a set of generic cheats which gives an idea about the genre of the game. Sharing the information on games brings people together and creates a network.

These aspects on cheating are focused much more on player – game interaction; where cheating as a external force creates an addition to the internal game mechanics and therefore expands the game experience. In contrary to these, there is a set of negative aspects on cheating in computer games.

Aporia-epiphany conceptions are important issues in game play. Aporia means being stuck in a phase of an adventure game or a hypertext narrative, not able to advance any further and epiphany is the feeling of glory when someone finds the way to proceed in an adventure game or labyrinth-like hypertext (Aarseth, 1997, p: 33). Using cheats to come up with an obstacle in a game, makes the player feel himself/herself less successful and makes his/her glory worthless.

Playing in special modes -such as God mode- prevents the pleasure derived from game play. One of the basic components of game concept is risk, i.e. the possibility of losing. However in God mode for example, there is no way to lose. Consequently, fun does not advance through win or lose options; this destructs the winning desire as a definitive concept of game play.

To discover hidden moves out of the game concept stops the continuity of the game and encourages the player to leave the game flow. In some genres, hidden moves are seen traditional. However, designers need to develop ways to keep players to discover the hidden moves within the context of the game. For designers, to supply the information about secret moves on web sites, in other publications is a possibility, but it is not the best method for several reasons. It both breaks the continuity of the game and encourages the player to leave the game flow. However, designers' primary concern is to keep players in the game as long as possible. Also, it is possible that they can't find the information they searched, causing a blockage to game play (Ray, 2004, p: 12).

Especially in MMORPGs[4], if someone cheats, it affects the others: Many academicians and gamers think that cheating in single player games is not a big deal, because you play against computer, not against other humans. Because in MMORPG universe all the goods have a value both in game world and in real world and creating a character take a great deal of time. Items, superior characters are sold even in eBay. Due to both its economical background and time that is spent, cheating in MMORPGs cannot be tolerated. This situation is also closely related to the game industry. If cheats in a game becomes a problem for its gamers, it becomes a problem for its developers and publishers too: The growth in the number of cheaters in a game, people may choose to quit and leave the game. They don't pay their subscription fees, they don't buy additional products. The brand loses value and the company loses money (Zetterström, 2005, p: 11).

Negative aspects on cheating much more consider it as a disturbance of internal mechanics and resultantly the game experience. Either used by players or encouraged by designer, an overuse of cheats ends with an unpleasant game-experience. Using cheat codes in a multi-player game is a reflection of real life cheating and therefore is unacceptable for both players and designers.

Positive Aspects	Negative Aspects
Cheating is a way to slip out from limitations of the game world and creates a new experience.	Playing in special modes-such as God mode- prevents the pleasure derived from game play.
When the player get stuck in a game, cheats allows him/her back into the game.	Cheats make you lose your epiphany.
Cheats increase re-playability of the game.	To discover hidden moves out of the game concept breaks the continuity of the game and encourages the player to continually leave the game flow.
Cheats create a game-network through web-forums.	Especially in MMORPGs, if someone cheats, it affects the others.
Cheats allow the player to just walk around and observe the game universe.	If cheats in a game becomes a problem for its gamers, it becomes a problem for its developers and publishers.

Table 1. Positive and negative aspects of computer game cheating

Although in MMORPGs and other multi player virtual worlds cheating is considered unacceptable, using one other external dynamic is widely accepted both by the players and designers: Money.

Virtual worlds are simulations of an environment created by a computer or a network of computers. Users connect them through the Internet and the entities in this virtual

[4] Massively Multiplayer Online Role Playing Game

world act under the control of individuals. The most popular virtual worlds are settings of massively multiplayer online role playing games and several people can participate into the environment simultaneously. This virtual environment continues to exist and develop internally even the users log off, this makes them persistent.

In these persistent MMORPG worlds, in addition to the game developers and game world operators who fulfil players' needs offering them variety and new interests, there is a secondary market which allows players to acquire advantages through "virtual assets".

Vili Lehdonvirta (2005) divides "virtual assets" into four categories as "currency, personal property, realty and avatar attributes". Most of virtual worlds have their own internal currency such as "gold pieces" in Ultima Online, "platinum pieces in EverQuest" or "Linden dollars" in Secondlife. Virtual currency has the same functions as in real world. Another asset personal property or virtual items including weapons, armors, costumes, furniture and other transferable properties that an avatar can possess. These items can ease the player to achieve the objectives of the game. The third virtual asset category is realty. In some of the games the player can have a building or a land which also has an expressive value just like in real world. The last virtual asset is avatar attributes. Skills for an avatar are acquired through beating foes, overcoming conflicts etc. Therefore, the players cannot exchange the assets partially. They should transfer the whole account including all the avatar skills and its possessions.

An experienced player can sell these "virtual assets" she/he has earned in the game on real-money markets such as e-Bay. Also there are both designer and third-group companies selling "virtual assets" on the Internet. The selling of "virtual assets" creates a reflection of the real world economics on the game world. A rich player can easily have an experienced avatar. This new economy is a totally external dynamic to the game play but still is accepted by all sides.

Comparison and Conclusion

Both oral story tradition and computer games provide an interactive system. In oral tradition the "open form" creates an interaction between the story-teller and the audience. In computer games the player interacts with the game through rule systems or game mechanic and interfaces. In multi player games there is also an interaction among the players themselves. The interaction process operates through internal dynamics. In oral tradition the story-tellers' preparations and the emotional interaction form the story. In computer games the internal dynamics are determined by rules; rules determine what the player can do and how the game will respond.

External dynamics are attempts to influence the interactive systems from beyond the limits of their interaction models. Gifts and threats or different kinds of cheating for various reasons are such attempts.

Losing the epiphany and coming back into the game through cheating are opposite approaches towards the same aspect of cheating; speeding up the narrative. This aspect is similar to giving a Naqqal gifts to continue his story. But although the affect on is similar, using a cheat code or walkthrough is manipulating the internal dynamics of the game, however giving gifts intends to speed up the narrative without manipulating the open-form.

The opposite of Naqqals situation, Ozans slowing down the narrative to get gifts is, on the other hand, similar to the conception of breaking the continuity of the game. Like the designer encouraging the use of cheat codes, here the Ozan indirectly forces the audience to give him gifts or money. In fact in this situation the Ozan is the one who cheats.

Manipulating the story-teller by gifts or threats is both a positive and negative way of approaching an interactive system. It creates a new narrative experience beyond the limits of the "open-form", where the interaction is limited to the level of side stories, and gives the audience the unique opportunity to be a part of creating a new dramatic arc. Yet, especially using threats is a compelling action towards the story-teller and destroys the interaction by forcing one side. Also it destroys the dramatic effects of the original story. A similar duality can be found in using cheats; they can create a new experience or prevents the pleasure derived from game play.

A clear act of cheating both in oral tradition and computer games is cheating against other individuals or groups. Both, fighting groups supporting different heroes, and cheaters in multi-player games have destructive effects on the interactive system. Like the real world, a cheat against an individual or group is not accepted in virtual societies.

There are two issues which might create confusion: The first one is the sale of "virtual assets". This is similar to cheating against individuals or groups but is accepted by communities. It assembles real economics and social classes in to the virtual world. If it is reflected to the oral tradition; this is the difference between rich and poor story tellers. These are basic realities which can not be rejected especially by commercial games. The other one is the use of cheats for observing the game universe. This stops the game play and turns the game world into a design object. A player using cheats for this purpose has the same motivations with someone who studies the design of shadow puppets.

To sum up, while the oral story telling traditions are one of the oldest and computer games one of the newest examples of interactive entertainment, both cases show similar external manipulation attempts towards their systems. Although the ways of manipulation are entirely different, the desired results are very similar. Such similarities might help comparing and remixing historical forms of cultural expression with contemporary media practices.

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DESIGN AS A NEGOTIATOR BETWEEN SELF AND ITS WORLD – TOWARDS A REASONABLE STATE OF DISORDER

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Abstract

The objective of this paper is to try to present a conceptual model for understanding the mutual existence of "disclosing - designing subject" and the "disclosed - designed object" within the concept of "disclosing whole". The text is also an attempt to understand and explain the necessity and possibility of somehow objective and verbally describable knowledge in design research and theory based on the concepts of "whole" and "wholeness". Disclosing whole is presented as the primordial subject matter of design research and it is deduced into its primary sections, "the synchronic self" and "the sequential world", leading the way to somehow objective knowledge in design. Finally, "doing" as the side of divisive order and "undoing" as the side of associative disorder are introduced as the primordial faces of human disclosure in order to gain an insight about mutual contexts of design and use.

Introduction

Still today, as for other fields of meta inquiry, essential problems of modern design discourse, especially of design theory and philosophy are rooted through the ancient duality of "observing - manipulating subject" and "observed - manipulated object": ontological question of "what design is"; epistemological question of "how design does"; and ethical question of "what design should do" (Alvesson and Sküldberg, 2000). The objective of this paper is to try to present a conceptual model for understanding the mutual existence of "disclosing - designing subject" and the "disclosed - designed object" within the concept of "*disclosing whole*". Basically the text is in search of an insight for obtaining and sustaining a somehow "objectively reasonable" state of disorder or disaster within the universal set of life: that is the whole of the world; besides and apart from local and partial orders and welfare within its subsets.

Friedrich Hayek notes that artifice can be "the result of human action but not of human design" (Mitcham, 2001). Non-design, Hayek seems to say, always encloses design; design can never be ultimate, and therefore should recognize its limitations. Mitcham (2001) adds that the truth is that even in design, results extend beyond intentions and these results become phenomena to which we, even in our attempts to redesign them or to design around them, must accept. With a strong reference to the concept of "dialectics", Fry (2003) puts out that whatever we identify, there is also which evades and escapes that is other and supplementary. Design, order and truth is never simply a victory over non-design, disorder and untruth but a perpetual struggle with its own internalized negation.

Here, in this paper, I will try to present the construction process and outputs of an articulated holistic model that is a philosophical and speculative projection through a web of conceptual relations and interactions. The act of projection aims to a deep understanding process of the mutual whole of designing and using, which is also producing and consuming, in order to design, to use and to pass as sustainable as possible; that is also sustaining a somehow objectively reasonable state of disorder. The text is also an attempt to understand and explain the necessity and possibility of somehow objective and verbally describable knowledge in design research and theory based on the concepts of "whole" and "wholeness"; especially in terms of the wholeness of primary dualities such as subject and object, natural and artificial, living thing and non living thing, order and disorder and part and whole.

Galle (2002) points out that the philosophy of design is useful simply because it offers us insights about design which we could not obtain otherwise. Within the philosophy of design, all aspects of design and insights about them are obtained by rational reflection rather than empirical observation. Moreover it seems that these insights could not have been gained by anything but such reflection. Essentially, the modeling is a meta effort to put out something about the "ur-phenomenon" of the disclosing whole. Goethe argued that, in time, or of commitment, practice, and proper efforts, the experiencing researcher would discover the ur-phenomenon, the essential pattern or process of a thing (Seamon and Zajonc, 1998):

> Ur- bears the connotation of primordial, basic, elemental, archetypal; the ur-phenomenon may be thought of as the "deep-down phenomenon", the essential core of a thing that makes it what it is and what it becomes. For example in his botanical work, Goethe saw the ur-phenomenon of the plant as arising out of the interplay between two opposing forces: "the vertical tendency" and "horizontal tendency". The former is the plant's inescapable need to grow upward; the latter, the nourishing, expanding principle that gives solidity to the plant. Only when these two forces are in balance can the plant grow normally.

Necessity, Possibility and Reliability of Design Knowledge

A widely known expression of Simon (1969) puts out that everyone designs who devises courses of action aimed at changing existing situations into preferred ones. For him the intellectual activity that produces material artifacts is no different fundamentally from the one that prescribes remedies for a sick patient or the one that devises a new sales plan for a company or a social welfare policy for a state. Design, so constructed, is core of all professional training; it is the principal mark that distinguishes the professions from the sciences. Besides that, within meta discourse, design as the primary underlying matrix of life (Papanek, 1984), is often presented as indicating an "ontological space" that lies outside the boundaries of verbal discourse; that is literally indescribable in linguistic terms. That talking of propositional knowledge in this area, or making knowledge claims about the thinking process of designers, may be fundamentally wrong-headed (Daley, 1984).

Design is not an activity performed only by some distinguished professionals but is basic to all human activity. "All men are designers, all that we do, almost all the time, is design", says Papanek (1984); it is the conscious and intuitive effort to impose meaningful order. As Fry (1994) suggests, design is the anthropocentric imposition of direction. Fry (1999) says that design is everywhere as the normality of the made world that is rendered background as soon as "design" becomes an individuated object of focus. For him to reify design, which is to present it in an objectified form removed from its dynamic in process, is to misconstrue the vary nature of what design is. Design is prior to, within and independent of both the sciences and humanities. Fry (1999) thinks that although we, and the worlds we occupy, are significantly determined by design, it has never actually arrived as a serious object of inquiry. Besides that Krippendorff (2006) claims that, not everyone who acts to make the world a better place calls him or herself a designer. He says:

> Design as a professional practice differs from design in everyday life by relying on publicly acknowledged competencies, the use of methods, but above all on an organized way of languaging, a design discourse, that coordinates working in teams and with clients, justifies proposals for artifacts to their stakeholder, and distinguishes professional designers from those doing it largely for themselves.

The necessity and possibility of a reliable knowledge in design theory, practice and education lies in the understanding that for both levels of designing, everyday or professional, design as basic human capacity acts upon and directs a "world" that is shared by others. For contemporary design theory and philosophy the distinction between "everyday design" as conducted by so called "users" and "professional design" as conducted by so called "designers" disclose an essential dilemma to overcome; that contradiction may be stated by two mutual propositions; the first to be called as "subjective" or "hidden" and the latter as "objective" or "disclosed" (Jonas, 2002; Friedman, 2002).

1. Subjective issue: Design as a basic human capacity, a mode of inquiry and the underlying matrix of life seems principally and originally hidden, unattainable and

uninterferable for objective knowledge. It implies an entity or an experience settled in an ontological space that resists to division, differentiation and inter subjective communication; it is beyond the limits of verbal language. So, design cannot be modeled as a system indicating an organization, a process and a product.

> **2. Objective issue:** Although that every single human being live and experience the outcoming results of design by himself, the effects of design and the direction it implies are disclosed, viewed and felt in a world shared by others distanced apart from the originator subject. That world seems somehow objective, affording inter subjective verbal communication; it also allows things to be seen in organization indicating the existence of processes and products.

As a necessity of the objective issue, the professional designer has a inter subjective, social or worldly "responsibility" of his actions, that he has to act by knowing, carefully and intentionally disclosing artifacts forming and ordering the world he share with others. Besides that as a necessity of the subjective issue, the professional designer does not seem to have a reliable way to explain, to systematize and to organize the design process that is essentially covered and hidden for objective and verbal knowledge. While he is responsible of his actions, the deep down structure bringing him into action, creating and transforming his intentions always stay beyond the limits of his worldly conceptualizations, systematizations, modeling and languaging. Design knowledge is crucial and necessary, while it is systematically and linguistically impossible and unattainable. That essential contradiction brings out a vital question: If all the organisms, and in accordance with particular theories all the particles in the universe are already and always processing to solve problems and if design is inevitably actual and continuously going on within the whole of the existence, then is there a ground for the "necessity" of conducting design research for attaining insights, bringing explanations and creating knowledge in the context of professional design? Besides its necessity, is it "possible" to reach to reliable knowledge by design research? Besides its necessity, possibility and reliability, where should the researcher or the theorist look at and head towards to disclose that hidden knowledge, what is the source of it? What is the primordial subject matter of design research?

The Ur-deduction of the Disclosing Whole

Here the central, primordial or the original subject of design research and theory is introduced as the *disclosing whole* that is complete, indivisible and an absolute thing in itself; in contradiction with its disclosing character it is essentially concealed, hidden and covered to examination from outside. It has the basic capacity to design. Unlike the linguistic wholes that systematically and hierarchically divide into parts and combine into larger wholes, *disclosing whole* represent an ontological level that all the primary dualities that construct, control and sustain the wholes of language are in a indivisible and continuous wholeness, like subject and object, natural and artificial, living thing and non living thing, order and disorder etc.

Von Bertalanffy (1971), the founder of General Systems Theory, notes that in one way or another, we are forced to deal with complexities, with "wholes" or "systems", in all fields of knowledge. He says:

> Nevertheless, the necessity and feasibility of a systems approach became apparent only recently. Its necessity resulted from the fact that the mechanistic scheme of isolable causal trains and meristic treatment had proven insufficient to deal with theoretical problems, especially in the biological sciences, and with the practical problems posed by modern technology.

He also adds that mechanistic approach just mentioned appeared to neglect or actively deny just what is essential in the phenomena of life. Jonas (2003) claim that design activities change the world, without being able to predict anything, except, maybe, the correct functioning of an artifact in a very restricted manner. He gives the example of cars as isolated artifacts are working ever more perfectly. Besides that he notes:

> But design activities always comprise and affect "wholes" consisting of non-causally connected components... The external boundaries of these wholes are fuzzy, their internal relations cannot be defined in scientific terms, their behaviors are unpredictable. Therefore design should be theoretically conceived as a practice of not-knowing.

As a result of the subjective issue mentioned above, the concept of *disclosing whole* comes with an impossibility to comprehend, understand and know objectively; so in order to disclose the primordial relations and interactions that model it as an organized and processing system, as a necessity of the objective issue, we need a deductive approach rather than an analytic induction where the concealed and unknowable *whole* is spontaneously and synchronically spaced within itself, opened out and interrupted into its "primary sections". Methodologically, this may be seen as a "phenomenological reduction" or a "hermeneutical disclosure of something hidden deep inside" (Husserl, 1965; Vattimo, 1997). This primordial disclosure may be stated as deducing and interrupting the continuous, inconceivable, complex and unknowable *whole* into its primordial partitions; taking it away and removing from itself; creating a viewing and participating distance within itself in order to "make sense" and disclosing comprehensible, knowable and somehow systematic relations that constitute the primary subjects of knowledge, meaning and understanding in design research and theory. It is an eternal separation within the *disclosing whole* that is the "*whole* of human" that makes sense. Theoretical deduction of the *disclosing whole* aiming to understand, to know, to conceive and "to make sense" of it is not an interruption that has happened in a certain time and place but it goes on continuously and eternally as capacities of making sense, organization, ordering and cognition are the main indicators of life (Csanyi, 1989; Eigen, 1992; Kampis, 1991; Maturana & Varela, 1987).

I introduce an ur-phenomenal pattern, the primary sections of the essentially concealed but actually *disclosing whole*; that are the "self" as the central agent and its "world" as the periphery for which the self is responsible and takes care of by viewing, participating, ordering and forming. After deduction, one of the mutual primordial parts within the supposedly theoretical abundance will "necessarily" come forward, hold the centre and appear with the claim and mission of "representing" and thus taking the responsibility of the *disclosing whole*. So while the *disclosing whole* was unconceivable and unknowable pre deduction, now it makes sense by a central self that is "conscious" and reflects, interprets and knows its peripheral world. The self represents the concealed *whole* pre-deduction so it also represents the concepts of wholeness, uninterrupted oneness, undivided completeness and singularity; and it acts and behaves towards achieving those conditions. After deduction, the self conscious discloses and reflects "wholes" into its world that are principally "contingent". The representing self forces the parts of its world to create wholes of organizations, processes and products that afford verbal descriptions. So while the central self of the *disclosing whole* tends towards "linguistically unorganized wholeness", its peripheral world tends towards "linguistically organized togetherness". In other words, the self conscious of the *disclosing whole* necessarily represents the pre-deduction wholeness, thus it is responsible of its world. The world is known, made sense, interpreted, reflected and controlled by the self conscious. Since the self acts toward wholeness, it discloses "wholes" in the partial world of abundance and plurality in "togetherness"; that are artificial and contingent wholes.

As a matter of the subjective issue mentioned above self conscious of the *disclosing whole* cannot be divided; for each human being there is one actual, directly experienced and phenomenological "lived" necessity, one natural whole and center of meaning that is himself, constituting the pole of subjectivity. Although there is only one single "lived" necessity and consciousness for every human being that is himself, within the framework of ur-deduction, he has been distanced from himself disclosing a reflecting world where he contemplates some other selves as "necessarily living". As a result of that, a mediator world of contingency is spread and diffused in between those selves constituting the pole of objectivity. The *disclosing human whole* is alone with himself, while together with others in his world. The self of the *disclosing whole* is necessarily and inevitably "lived" and "experienced" leading to the concept of subjectivity and the world of the *disclosing whole* is contingently "viewed", "participated" and "shared" leading to the concept of objectivity. The self conscious may be presented as a web of network that has boundaries with its world consisted of both other selves that are the origins of disclosures and also wholes of disclosed things that are spatially in togetherness and temporarily in sequence.

Here firstly, design is introduced as a fundamental attribute of any *disclosing human whole* or system that is centralized and represented by immaterial "self consciousness" and surrounded by its material "world". An essential and necessary "formal unfit" between the self and its world is recognized for

which design is a mediator as the basic capacity of the whole. This unfit is stressed as inharmoniousness or incompatibility on the widespread web of boundaries between the designing self and its world. Jonas (2003) also presents design as the agent/parasite/joker which creates temporary fits between the co-evolving systems of cultural evolution, namely: communications, consciousnesses, bodies, as autopoietic systems, plus artifacts as allopoietic systems.

Secondly, a linear, local and sequential "world" rendered by Euclidean geometry of classic physics and science, and a non-linear, non-local and synchronous "self" rendered by fractal geometry of contemporary complex systems science and quantum physics are claimed to be the basic mutual entities within the *disclosing whole* (Martinez, 2001). Here, design is understood as a fundamental position of the whole as a negotiator through the widespread web of boundaries between non-linear, non-local and synchronous patterns of the conscious self, and linear, local and sequential organizations of its world. Design as a negotiator search for "contextual fitness", harmony and compatibility between the self and its world which is projected as an instantaneous and temporary order within the fuzzy boundaries of the context; while simultaneously it may be faced as a disorder or a thread outside the context, within a wider whole (Van de Vijver et al, 2005).

Martinez (2001) has developed a bio-cognitive epistemology explaining the process of knowing. In the process of knowing, he explains, bioinformation is selected, stored and retrieved as contextual fields of inseparable cognitive, biological and cultural parameters. These bio-informational fields are decontextualized from linear to non-linear space during storage and recontextualized from non-linear to linear space during retrieval. Bio-information is expressed linearly and locally through the nervous, endocrine and immune pathways in a space of Euclidean geometry, and is impressed non-linearly and non-locally in a space of fractal geometry in the totality of the field.

Above, the primordial or the original subject of design research and theory is introduced as the *disclosing whole* that has the basic capacity to design. Unlike the linguistic wholes that systematically and hierarchically divide into parts and combine into larger wholes, *disclosing whole* represented an ontological level where all the primary dualities that construct, control and sustain the wholes of language are in a indivisible and continuous wholeness. After the primordial disclosure of the self and the world, design research and theory may be seen as dealing with two levels of wholes and wholeness that are verbally describable and relations and interactions of which can be systematically modeled representing them as explainable organizations:

1. Necessary and natural wholes that are disclosing and living entities as the "self". Human beings, both ordinary and professional who are continuously designing and using to disclose contexts of life are examples of these wholes. Designers, their clients and users as actual persons away from all kinds of titles and positions are examples of such central wholes for design theory.

2. Contingent and artificial wholes that are disclosed and affording entities in the "world". They are originated in and depend on necessary and natural wholes. Artifacts as wholes are disclosed by natural wholes as a necessary result of their orientation towards wholeness. They may resemble natural wholes in several manners but lack of an independent self consciousness. Although they have vital effects on natural wholes, since they are not originally representing entities, they are not responsible of those causes.

The main important distinction between necessary - natural wholes and contingent - artificial wholes is that, artificial wholes are not "disclosing" entities in the sense that natural wholes are; which is also the indicator of life in natural wholes. Despite the fact that they may seem as disclosing, they are primarily disclosed entities and they "afford" means for further disclosures. They have no necessary existence independent of natural wholes. They basically take place in a world organized linearly, locally and sequentially. They are mediators, negotiators and fittings in between necessary and natural wholes that exist relative to each other in a world of togetherness. Artificial wholes do not disclose some other wholes, represent them or take their responsibility but they do afford means of disclosure for natural wholes. The way taken by a car, the work done by a vacuum cleaner, the lighting streamed by a table lamp or even automated machines producing products out of disordered

raw materials may resemble natural disclosures but they are not disclosures in the sense that human wholes do disclose artificiality. These artifacts afford possible disclosures for the self. Kroes (2002) suggests that technical artifacts have a dual nature: on the one hand they are physical objects (man-made constructions) that may be used to perform a certain function, on the one hand they are intentional objects since it is the function of a technical artifact that distinguishes it from physical (natural) objects and this function has meaning only within a context of intentional human action. So, necessary and natural wholes disclose affordance into the world, while contingent and artificial wholes afford disclosures for the self.

The Primordial Faces of Human Disclosure

We may talk about a single stream of disclosure out of any natural and necessary whole aiming to construct an order within its peripheral world by creating contingent and artificial wholes. But this "constructive" disclosure would have no meaning if there was not a state of disorder within the orientated world of artifice. The self observes this disorder or problem out of the disclosures of other natural and necessary wholes that is the destructive face of disclosure. Although there is a single stream of human disclosure, it is relatively constructive or "destructive". As it gives an order and constructs something, it also creates a disorder and destructs something within a greater whole in the world of togetherness. Everyday designing of so called "users" may be seen as the destructive face of disclosure relative to the professional designers who primarily construct ordered wholes to be used by them. Everyday designing disclose problems to be solved and disorder to be ordered.

Buchanan (1994) tries to speculate on the term culture as follows: "Culture is not a state, expressed in an ideology or a body of doctrines. Rather it is an activity. Culture is the activity of ordering, disordering, and reordering in the search for understanding and for values that guide action." When designing is taken as cultural dynamics of order, it is understood by the presence of its opposite, cultural dynamics of disorder. So *disclosing human whole* may be viewed through a basic mutual opposition: the face or the side of ordering, for that I choose the term "doing", and the side of disordering that I prefer to call as its opposite: "undoing" (Turan, 2002). These are not the sides of the artifact, but in fact, of the human being and his active, participative togetherness with the artificial, social and natural environment, which he inhabits. I will express that participative togetherness with the term "human struggle" or "human disclosure".

As presented here, "context of design" as put out by the constructive face of human struggle in connection with ordering, producing and constructing, and "context of use" as put out by the destructive face of human struggle in connection with disordering, consuming and destroying are interconnected mutual entities of human disclosure into the world in which he takes place and time with other people and things. Since the interaction of these entities may be thought of holistic and mutual rather than analytic and autonomous, it is impossible to dismiss that some kind of using and disordering is involved within the context of design, and some kind of designing and ordering is involved within the context of use, which makes them impossible to strictly determine. Metaphorically I will point out two basic and inherent sides of human disclosure just as left and right: "the side of divisive order" that is what I called "doing" as partially projecting the context of design and "the side of associative disorder" that is what I called "undoing" as partially projecting the context of use (Figure 1). These two opposing entities are in a constantly changing mutual relation without a clearly definable purpose.

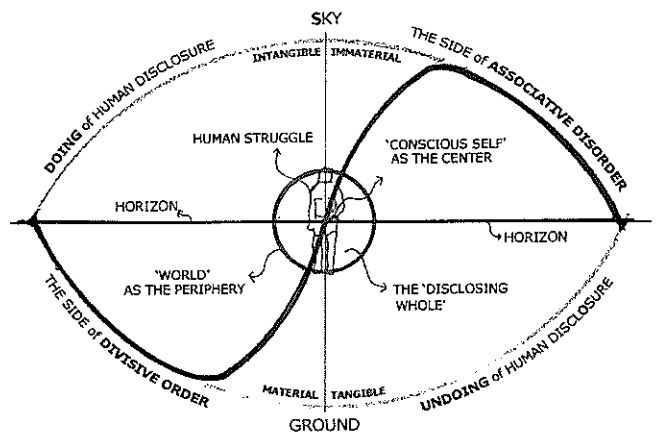


Figure 1. The Primordial Faces of Human Disclosure

The doing of human disclosure, which is the side of divisive order, is the side in which relations as decomposition, differentiation, opposition, separation, discrimination and

decision are originated. It systematizes, partitions, divides and orders in order to bring into being by doing it. Although it seems like something constructive, it inhabits the destructive face of construction that is limiting the possibilities, freezing and solidifying the world. Depending on a permanent but unfounded web, it has the inner tendency to create a temporary ground to stand on, which is also replacing something old with something new. The doing is like the left or right of human being in place and time. It is the other side of undoing. Just as left and right get mixed up, dispersed in each other in human strolling in time and place, doing and undoing are dispersed in each other in human struggling on the line of "horizon". Our world of experienced phenomenon embracing the contexts of design and use, is a world of continuous indeterminacy consisted of the osmotic transition between doing and undoing. Besides that, doing lowers, takes down to the ground what it partitions, divides and orders in order to bring into being by doing it is. Thus, it makes "knowable" and "visible". It is mainly related with the tangible and material ground, the below, underneath of disclosing human struggle into the world that is principally on the line of horizon.

The undoing of human disclosure, which is the side of associative disorder, is the side in which relations as unifying, making a whole, equaling, pairing, making synchronic, making identical and alternating are originated. It non-systematizes, completes, associates and disorders in order to take out of being by doing it is *not*; that is undoing. Although it seems like something destructive, it inhabits the constructive face of destruction that is enforcing the possibilities, boiling and vaporizing the world. Depending on a temporary ground to stand on, it has the inner tendency to create a permanent but unfounded web, which is also replacing something new with something old. The undoing is like the left or right of human being in place and time. It is the other side of doing. Just as left and right get mixed up, dispersed in each other in human strolling in time and place, doing and undoing are dispersed in each other in human struggling on the line of horizon. Our world of experienced phenomenon embracing the contexts of design and use, is a world of continuous indeterminacy consisted of the osmotic transition between doing and undoing. Besides that, undoing raises to the sky what it completes, associates and disorders in order to take out of being by doing it *is not*. Thus, it makes "unknowable" and "invisible". It is mainly related with the intangible and immaterial sky, the above of disclosing human struggle into the world that is principally on the line of horizon.

Conclusion

Doing as the constructive face of human disclosure indicates a vector from the centre to the periphery representing the selves' conscious disclosure into the common world. Undoing as the destructive face of human disclosure indicates a vector from the periphery to the center representing the world's cooperative response affecting the selves. Results of undoing as the context of use extend beyond intentions of doing as the context of design and these results become phenomena that professional designers, even in their attempts to redesign them or to design around them, must accept. With reference to Simon (1969), Kroes' (2002) expression presenting the duality of inner and outer environments promises useful insights about the mutual existence of doing and undoing. He says:

> In the design context, the main emphasis lies on how to construct a physical system (object) that realizes a certain function. This function is often described in terms of a list of specifications which the object to be designed must meet (inner environment). In the context of use, the outer environment presents itself. There, the function of the artifact in relation to the realization of goals (ends) is of prime importance and the physical constitution of the artifact becomes of secondary importance.

Everyday designing of so called "users" (outer environment) may be seen as the destructive face of human disclosure relative to the professional designers who primarily construct ordered wholes (inner environment) to be used by them. Everyday designing discloses problems to be solved and disorder to be ordered.

The concept of *disclosing whole* promises positive insights about ontological, epistemological and ethical articulation of design theory and philosophy; ontological question of "what design is", epistemological question of "how design does", and ethical question of "what design should do" are presented as interconnected and articulated in a *disclosing whole*

representing an ontological level that all the primary dualities that construct, control and sustain the wholes of language are in an indivisible and continuous wholeness, like subject and object, natural and artificial, living thing and non living thing, order and disorder etc. The concept of disclosing whole and its ur-deduction is also useful in understanding and explaining the necessity, possibility and reliability of somehow objective and verbally describable knowledge in design research and theory.

In this paper, I tried to follow the footprints and catch the clues of the deep-down phenomenon, the archetypal pattern or process within the terrain of design. Maybe not the ur-phenomenon itself, but the continuous process of experiencing, interpreting and understanding towards it has the potential to show us how to live, to design, to use and to pass within the limits of optimum sustainability, that is obtaining and sustaining a somehow "objectively reasonable" state of disorder or disaster within the universal set of life: that is the whole of the world; besides and apart from local and partial orders and welfare within its subsets. Heading towards optimum sustainability should at the same time mean the chase of deeper responsibility on volitional and intentional action in designing and ordering our material and immaterial environment. Sustaining an objectively reasonable state of disorder would not only stabilize materially visible pollution, but it will also decrease materially invisible pollution as well, which is the loss of quality in everyday human experience with the surrounding whole.

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DANCING WITH DISPLACEMENT: THE CONDITIONS OF DISPLACEMENT IN ATHENS

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Abstract

This paper addresses the transformation of spaces and objects in metropolitan conditions of displacement.

Refugees and immigrants without papers move to the great metropolises forced by wars, or other causes. Impoverished they reach the metropolises and transform the existing conditions in order to survive. Disorder results in the metropolises from the movement of displaced urban nomads. A new design, fluid and physical, results through everyday needs and habitation.

Athens constitutes a stopover for people from Iran, Iraq, Turkey, and Eastern European countries on their way to other European Union countries. The refugee reception center in Lavrio and the other small centers run by non-government organizations cannot cover the needs created. Consequently, people are often forced to live in the streets or in crowded houses. The street, the square, the public space and urban voids become spaces of habitation, work and expression for the displaced. Such areas are found in the center of Athens in streets, like Menadrou, squares, like Koumoundourou, and open markets, like the former Korean market.

The paper examines how the concept of place is transferred and what the characteristics of these temporary habitations. The nomads' autonomous tendencies lead them to create new spatial actions which are characterized by dispersal and disorder in the fabric of the city, as well as new objects through improvisation with makeshift materials. This disorder, however, also creates a new spatial transformational order. A number of architects and designers have received inspiration from these novel urban conditions.

The case study of Athens

> Today we cannot talk about man's needs in terms of space but about the multiple, different needs of multiple, different people in terms of private and public spaces (Vrychea 2003).
>
> I used to sleep in the park. We were driven out. Now I sleep in a house at Petralona. There are usually 100 people sleeping there, not always the same. Staying there costs 3 euros per night. The house has five rooms, a bathroom and two toilets. We live on top of one another. It was better before, when I could sleep in the park (A young Afghan living in Athens, 27-3-2005).

The following case study took place in the Greek capital between 1999 and 2005. The methodology consists in a mapping through the researcher's physical experience and wandering in parts of Athens and in the bibliographical exploration of the various concepts.

The fieldwork is based on the views of Clifford as analysed in the chapter on 'Spatial practices', in which the actual field is the social space. The object of the project is not really Athens and the spaces it examines, but the social group to which it refers: the displaced urban nomads. Empirical research is used to clarify as much as possible the meaning that 'habitation in travelling' or 'habitation in motion' has for the displaced.

The journey

> Few escaped the stormy sea
> Swimming to the coast, their skin roughened by salt
> And blissfully reached the land, having escaped death
> Homer, *Odyssey* 12, vv. 236-38

From 1990 onwards, Greece received increasing numbers of displaced urban nomads. Given its position on the map, Greece constitutes a 'passage' which often becomes a stopover or a temporary abode for the new nomads.

The country receives asylum-seekers from Asia and economic immigrants from Albania, the former Soviet Union, Poland and Rumania. They usually enter Greece illegally. To get there they have to travel great distances at a risk to their lives, on foot over land, or by sea in dangerous boats, and often they have to go back and set off again and again. Most new arrivals prefer Athens as their destination because they are close to public services and humanitarian organisations, there are more job opportunities and they can meet compatriots.

Given the restrictive legislation, for a long time they are classified as 'without papers'. Although many have grounds for seeking asylum, they do not apply for fear of having their application rejected. The number of those recognized as refugees is minimal.[1]

According to the recent Act 3386 of 2005, getting a residence permit as an immigrant is a long process; it only applies of those who arrived in Greece before 31 December 2004 and requires proof of having entered the country legally and having secured employment.

Hospitality

Officially, hospitality in Greece is only extended to asylum seekers, and then only in selected cases.

For years Athens remains with a single, totally inadequate Reception centre for asylum seekers in Lavrion and some small temporary facilities run by NGOs; a very few people are hosted in cheap hotels by the Ministry of Health, while the Nefeli programme of the Ministry's Foundation for Social Work and the UN Refugee Agency has 5-6 apartments in West Athens, with two families living semi-independently in each flat.

The people who are housed in the available facilities usually change every 6-7 months, but they can stay for as long as two years. After that, if they have the money they join forces to rent an apartment, in which case they are exploited by landlords who demand high rents for places with deficient lighting, ventilation and plumbing. Many are forced to stay in abandoned houses and factories, mainly in old neighbourhoods near the centre of Athens, while some end up living in the streets. These modes of habitation are characterised by fluidity and mobility. Since 1999, when I started my research, the only permanent space of hospitality is the Reception centre for asylum seekers in Lavrion.

As reported by the Greek Council for Refugees,[2] 'the phenomenon of refugee movements has acquired a highly complex character, compared to the period of conventional refugees in the years 1959–90, ... countries such as Greece, which have not developed a comprehensive legal framework and the infrastructure for the protection of refugees, are inevitably dysfunctional.'

The city as refuge

> How is it possible that on the way from Haftia to the Museum or from Omonia to the Ancient Agora – via Athinas Street – you can travel to all eight corners of the Universe... to see your Own people and your Strangers walking and arriving at the Athineon café (Ioannou 1980).

[1] In 2001, asylum was granted to 147 out of 5499 applications, plus 148 on humanitarian grounds; in 2002 there were 5664 applications, 36 granted and 64 on humanitarian grounds; in 2003 out of 8178 applications just 3 were accepted, plus 25 on humanitarian grounds; in 2004, 11 applications were accepted plus 22 on humanitarian grounds). (data: UN High Commission for Refugees).

[2] An officially recognised benevolent union at 25 Solomou Str., Athens.

'Our own' people and the strangers always come together in the centre of Athens. Whether refugees from Asia Minor or, later, internal immigrants, strangers have always hung around the city centre, in the area around Omonia Square, in search of jobs, accommodation or acquaintances. Often, even 'our own' people become 'strangers'. The strangers are those that one comes across in the public spaces of the city – in the streets, squares and open markets. The question is: does the city function as a refuge for those who get here? And if so, why is it the city that functions as a funnel/shelter for people's new collective presence?

As these people spend a lot of time out of doors, they become the main users of the public space of Athens. This is facilitated by the complex and dense pattern of buildings in this area, the many abandoned spaces, the commercial character of this part of town, the intricate web of arcades and stairs and the existence of the central market and the various open markets around Monastiraki, all of which open doors of communication. These types of habitation in the city's spaces/urban voids are of a fluid, changeable character, because once they are discovered they are banned, and the persecuted seek a new space in the city to host them.

This is a mobile habitation, with the peculiarity of being effected through the body and its motions, with few other means. Wheelbarrows, large colourful bags, bundles, fabrics and cardboard boxes are the physical elements of this habitation.

a. The habitation of Koumoundourou Square; a 'room' within the city.

Koumoundourou square is a central spot in Athens, in the area south of Omonia square. One of its sides is on Pireos Street, a thoroughfare that follows the route of the ancient walls of Athens and links the city centre with the port. One of the buildings around the square, the former Foundling Hospital, houses the Municipal Gallery. The square is also the terminal for buses to the western suburbs of Athens. In the period under consideration, the square and its surrounding area was neglected enough to be described as an 'urban void'.[3]

The settlement

The settlement of refugees began in October 1999, when Kurdish men, women and children gradually made their home in the square.

From the way some of them behaved, they seemed to be relatives or friends; or it may have been the common origin which led to this close relationship.

They used minimal materials to delimit their space in the square. Some slept in cardboard boxes, some on the benches, others on the grass under the trees. Despite their large and constantly growing numbers, they all managed to fit in.

The various outcasts who used to hang around the square were forced to move out, while passers-by kept to the pavements and the surrounding streets. They looked on furtively, feeling that the square now belonged to those inside it. A clear boundary had been established: there was an 'inside' and 'outside' of the square.

Later the refugees put up some tents and lived in them, in families or in male groups; one tent was taken up by a mother and her baby. When they were given some food, it was kept in plastic bags inside prams or hung on the trees. At one point, in the middle of the square, they used to roast Arabic bread and sing around the fire.

Habitation

In this form of habitation of a neglected square of Athens, an urban void is turned into temporary abode with minimal materials by a group of people who are themselves in a void. The square becomes a 'shelter', an interim space between the place they left and their unknown destination. It is a temporary address, a 'room' or a house within the city.

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[3] Urban voids are spaces created by the city itself in its process of transformation. They appear in the place of old buildings which were torn down or left to crumble, on empty plots, archaeological sites, disused public or private buildings, abandoned industrial facilities or sites. Their interest lies in the fact that, as abandoned places, they are open to transformation and to new situations in the city.

This room is delineated by the limits of the square, by the boundaries of the settlement. There are visible signs of habitation: tents, cardboard boxes, clothes' lines, blankets, etc.

Although clearly an outdoor space, it is characterised by introversion. It reflects the special traits of a group of people with common roots, and shows a uniform cultural and social behaviour; the memory of the birthplace is carried in the language, the music, the habits. It is an unwritten address on the map of the Kurds.

The concept of the threshold is there: on New Year's Eve, the inhabitants of the square received the outsiders (the people of Athens) and celebrated together.

The temporary residents of the square had a sense of ephemeral security, but no comfort. On the contrary, living conditions were hard and unhygienic.

The habitation had a strongly impermanent character, as these people knew they could be turned out at any moment. To many, their presence was offensive and menacing. The local storekeepers asked for their removal, fearing that the district would be stigmatised.

The habitation in the square lasted from October 1999 to February 2000, when the settlers were driven out by police forces. When the local authorities of Tavros and Egaleo refused to receive them at a former centre for infectious diseases, they were taken to the abandoned NATO base on Mount Pateras, but it was at a long distance from the city and the refugees gradually left it; many of them returned and tried to stay in derelict houses near the square.

Today, Koumoundourou square has been renovated. Around it there are now many Chinese clothes' shops. The square itself is usually empty; few people sit at the small café or on the grass, while foreigners (Afghans, Pakistanis) prefer to gather in the surrounding streets – Menandrou Str., Sapfous Str., etc.

b. Habitation in deserted buildings

Many displaced people inhabit empty houses in the old neighbourhoods of Athens – Psyrri, Keramikos, Metaxourgio, Kolonos, Stathmos Larissis. They usually take over a house in groups (of men, mostly), and live under particularly harsh conditions. They have no water or electricity, and they often steal current from the main conductor.

When the district of Psyrri was upgraded, they were forced to move to other areas such as near the Larissis railway station.

In this area, there are large, disused industrial spaces. The one I visited housed 100 individuals, Iraqi, Kurdish and Afghan men, who had used packaging cardboard and other waste materials to divide the space. The living conditions were appalling, without toilets or water supply.

Apart from an emergency solution, their action was a form of protest for the absence of hospitality.

c. Menandrou Street

Menandrou Street and the streets around it – Sapfous, Kirinis, Geraniou, Sofokleous, Eschylou, Evripidou – are the most typical meeting points for foreigners. This is an almost obligatory choice of area, as it lies near Omonia, the heart of the city, and Koumoundourou square, which we have already seen as one of the first places to attract the displaced urban nomads. The area has many abandoned houses, cheap hotels and hostels, and is easy to reach by subway from other parts of the city.

Menandrou Str. is one-way, from Omonia to Psyrri, and hosts the bus terminals for destinations in West Athens, Perama and Egaleo. There are many food and clothes shops run by foreigners, as well as many mobile phone stores. At the other end of the street stands the big church of St. Constantine.

On weekdays, but more so on Sundays, the street fills with groups of foreigners from various countries. They gather in the pavements and in the middle of the street and spend the entire Sunday morning there, standing or moving slowly, doing nothing – they are just a presence. This invests them with a special kind of dynamic.

They constitute a throng or a mass, which is sometimes a powerful enough element to obstruct both traffic and pedestrians.

The various nationalities use specific parts of the street, and this allocation determines also the merchandise in the shops. Pakistanis and Indians gather in the section between Aristofanous Str. and Theatrou Square, and small groups of Pakistanis meet in the afternoons inside and outside the restaurant of Aristofanous Str. The rest of the street up to the church attracts various nationalities – Pakistanis, Afghans, Africans, Arabs. The Arabs also gather at the small fast-food shop, while Indians and Pakistanis shop at the Indian-product markets. The area around the church of St. Constantine is the only meeting place for women from the former Soviet Union, who usually chat in large groups behind the sanctum of the church. One can also see a few African women in the street, or some Chinese women on their way to the shops. The cafés round the square on the other side of the church are frequented by Russian women who drink coffee or tea. At the same time an outdoor market emerges in the arcades and the pavements, for all kinds of products – mobile phones, socks, scarves. The peddlers appear around 11 in the morning, spread a cloth under the arcade and display their wares. Given that the area is rundown and 'hidden' behind Omonia and the Central Market, the police have not interfered so far.

This picture of the street is completed with the mosaic of languages and music. Dress code is important in this outing: Africans in white robes and Indians in national costumes, well-dressed and made-up Russian women, some with hats, and African women in long dresses, high heels and shoes can be seen walking up and down.

The smells of spices fill the air. They come from faraway places and change from one block to the next, from Indian and Arabic to Chinese products and foods. The shop signs are a special element in this street, written in different languages and designed as they would be in the country of origin. The walls of the buildings are full of notices and advertisements addressed to the street's temporary inhabitants.

The function of the street changes as it turns into a space of congregation and exchange of information. It becomes a portal of communication.

d. Street vendors at Monastiraki and the surrounding areas

The market or pazari [= bazaar] has always been a live, dynamic 'space' of the city, which is constantly evolving. A place for the exchange of goods, information and cultural references, it has a continuity across the history of Athens and generates variety and multiplicity. 'Since pre-classical times the centre of commerce in Athens has shifted but a little, always following the shadow of the Acropolis' (Micheli, 1990:51).

A fixture in the history of the city, the fair has always taken place at Monastiraki and the nearby streets. In recent years, it spilled out into the densely built area of Psyrri, in Ogygou, Sarri and Lepeniotou streets. There are no boundaries, and while some vendors and their products have been on the same spot for years, new ones are added constantly and bring new products – clothing accessories, mobile phones and various small objects – as the market expands into the streets around Monastiraki.

This expansion of the market adds variety and dynamism to the centre. On Sundays it turns into a feast as Athenians come from all over town. The fair represents the most accessible work opportunity for the foreigners who reach Athens. Those with steady jobs have work permits, unlike the foreign peddlers who have not and cannot get one, since most of them are 'without papers'.

On Sundays various Russians, Pakistanis and Africans arrive early in the morning with bags and wheelbarrows, spread their wares on the ground and delineate a 'space' next to each other using a shawl, a coloured paper or even the goods themselves. The selling is often accompanied by music, dance, snacks and drinks.

Around the time of the Olympic Games, there was a campaign by the city authorities to oust street vendors, who were forced to keep moving within the downtown area.

Arrests are often made and the merchandise is confiscated by the municipal police. One can often see people trying to disappear through the narrow streets while saving what they can of their goods.

Street vendors do not give up – they just move elsewhere. Their latest site is the far end of Ermou Street, also known as the Korean market. This shifting to a new space, and its subsequent transformation, is a remarkable characteristic.

The body as a vehicle for new spatial relations:
A new narrative of Athens as a city of marginal spaces

The body is the primary space of the displaced in the parts of Athens under examination: its everyday gestures and movements, its contact with such common functions as walking, resting, sleeping, eating, or sheltering from the weather. In other words, the body becomes a tool for designing and constructing spaces in hospitality centres such as those in Lavrion or Penteli, in public areas such as Koumoundourou square or in abandoned houses and factories. Humble materials – cardboard boxes, rope, cloth, nylon sheets – find new uses. Under these conditions the body rediscovers its forgotten skills. It draws heavily upon the memories of the homeland, and revives habits such as those we met at the Lavrion centre in our visits: you take off your shoes before entering the room and sitting down on a carpet for the tea ritual. During a visit, the space is transformed into a setting with elements of familiarity and hospitality. As the Kurds danced in the courtyard of the hospitality centre, their bodies conveyed memories from the native land and transformed the unfamiliar space. When street vendors spread cloths on the pavement to display their wares, the character of the street changes.

The association with other dispersed persons forms habitations. At first, the feelings of absence and loss are intense as the displaced can neither detach themselves from the old setting, nor adapt to the new one. After a physically and psychologically harsh journey, their desire to establish a habitation is expressed primarily through their body and through their involvement with others.

They are recognised by their walk, their postures, their accents and by the places where they hang around in groups.

The spaces they create are scattered in Athens and constantly changing. As active entities rather than pitiful beings, as they are often portrayed by the media, they generate flows and motions which pierce through the urban web and change the patterns of the city.

The difficulties they encounter make them adaptable and since in most cases they cannot go back, they accept their difference and opt to live with it, seeking others like them to share the journey.

What matters under these circumstances are the networks and the flows that are generated. Dispersal becomes their metaphorical home which goes everywhere, without any limits. Dispersal is the essence of their habitations in Lavrion, in Menandrou Street, in Koumoundourou Square.

Athens functions like a shelter. The various urban voids in its centre – shabby areas, abandoned buildings, archaeological sites – are like cracks in the urban web which enable such acts of dispersed physical habitation. In the heart of the city, another web is woven underground of an invisible city for the displaced. Their habitations are ephemeral; once a renovation projects start somewhere, they move at once to another part of the city.

Independence and the path of desire they develop during the journey lead them to new spatial relations in Athens, to new modes of habitation, to improvisation and ephemeral materials. The body as a design tool, involvement and the concept of dispersal determine the spatial relations of today's urban nomads to Athens; and architecture is called upon to explore these relations.

Dancing with displacement

The tendency towards autonomy, as well as necessity, leads them to the creation of an ever greater disorder in the structure of the urban web through habitation. The medium is the body which becomes the primary space of the migrant as s/he experiences what Agamben calls a 'bare life'.

With the body as a means migrants necessarily devise new spaces, transforming the existing ones - squares, streets, parks, or abandoned houses.

Through the physical trip without means, full of absences, they are lead to the discovery of desire, which they subsequently define primarily in terms of space.

They create new spatial relations - actions which are dispersed

SOCIAL RESPONSIBILITY OF DESIGN; CONTRIBUTION OF DESIGN IN DEVELOPMENT OF NATIONAL INDUSTRY AND ECONOMY

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Abstract

The purpose of the paper is to explore the theoretical underpinnings and practical implications of responsible competitiveness, where responsible business practices become a driver of national development.

The paper is based on literature search of design policy models and new business models association with the economic development of Third World societies. The paper is also based on a case study that argues cultural characteristics as a tool of making difference in competition and its contribution to development of national industry and economy.

The paper concluded that responsible business practices by using possibilities of industry and using design, can contribute to national development. Furthermore in new business environment where competition severe, the potential of Third World country markets are getting more important. Unsatisfied needs of this market can be satisfied with cultural aspects. National business and design strategies of national industry can make difference in competition in this area.

1. Introduction

According to the Design Policy Partnership, Socially Responsible Design Model has social responsibility issues such as sustainability, socially responsible decision-making, health, financial exclusion, developing world issues, environmental quality, gender equality, economic vitality and social inclusion (Wootton, 2004).

Although issues of social responsibility are very diverse and all of them are paradoxally connected to each other, contribution of design to Third World Countries will be argued in this study.

Actually Alpay Er (1997, pp. 294) suggests that there is a great diversity among the countries of the so-called Third World, such as 'Developing Countries', 'Less Developed Countries', 'Underdeveloped Countries', and 'Periphery' or 'Peripheral Countries'. We can assume that Turkey is in the 'Developing Countries', like other countries that will be investigated in this study.

There are 6.4 billion people on Earth today and it was only 2.76 billion just 50 year ago (Anon, 2004). The majority of this population lives in developing countries. Furthermore, although the birth rates in developing countries are stable, these rates are continuing its growth in the developing countries. Charles Owen (2004, pp. 3) foresees the total population of the world will be 10 billion in the next 50 years and Owen also emphasizes that this population growth will cause serious economical and social problems.

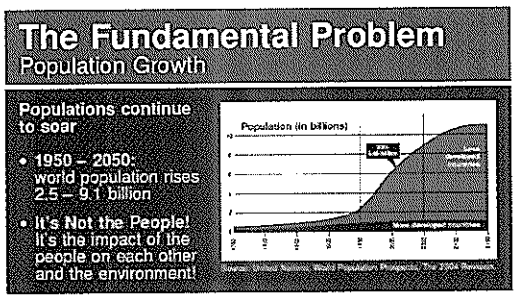


Figure 1.1 The Fundamental Problem: Population Growth. (Owen, 2004, pp. 3)

These unfortunate social and economic conditions of Third World societies have always instigated designers and design scholars to pay attention to the needs of these two-thirds

of the world population. In this scope Richard Buchanan's definition of design for human dignity and human rights is very important (Buchanan, 2001).

> "Design is not merely an adornment of cultural life, but one of the practical disciplines of responsible action for bringing the high values of a country or a culture into concrete reality... Design is the way we create all of the artifacts and communications that serve human beings, striving to meet their needs and desires, and facilitating the exchange of information and ideas that are essential for civil and political life. Furthermore, design is the way we plan and create actions, services, and all of the other humanly shaped processes of public and private life. These are the interactions and transactions that constitute the social and economic fabric of a country. Finally, design is the way we plan and create the complex wholes that provide a frame- work for human culture—the human systems and subsystems that work either in congress or in conflict with nature to support human fulfillment."

This definition basically means 'design is for people' and if we start at this point design can make differences in Developing Countries.

2. Design Policy

Sulfikar Amir (2004, pp. 73) suggests that industrial-oriented design policy is not adequate to answer the problem of the Third World societies, which design policy should be aimed at society not solely at of industrial corporations. Likewise Buchanan's notion of the foundation of human-centered design, Amir proposes a human-centered design policy which is a sort of design that involves analytical as well as creative processes in solving social problems.

Third World societies' foreign debts to First World financial institutions are very big problem. As Amir emphasizes this increasingly permeates and transforms the economic, social, and cultural fabric of the Third World, and creates its perpetual dependency on the First World (Amir, 2004, pp. 70). To reduce foreign debt and its burdensome implications, Third World countries have been trying to increase the export value of industrial products for international markets. Consequently this dependency can be eliminated by supporting national industry and economy.

The design problems of the Third World countries first find body with Victor Papanek. Papanek in his book Design for the Real World frames the responsibilities of design as "design must become an innovative, highly creative, cross-disciplinary tool responsive to the true needs of men [and women]" (Papanek, 1974).

In the International Council of Societies of Industrial Design (ICSID) organized the "Design for Need" conference in April 1976, it had manifested that the international design community's general awareness of design's responsibility in contemporary society, examining the social contribution of design at both the philosophical and practical levels.

Different from Papanek, Gui Bonsiepe construed the issue of Third World design from the political and economic relations between the First and the Third World.

Bonsiepe highlighted that there is an unequal value transfer from peripheral to central economies. Bonsiepe composed a model which is based on design transfers that would depend on an industrialization policy. This policy should promote a self-centered or autonomous economy, as against an outer-directed, dependent economy. Furthermore this policy should let design to "contribute to the satisfaction of local needs perfectly with local material and locally developed technology" (Bonsiepe, 1977).

Bonsiepe suggested that industrial design should be used as a tool in the process of industrialization of developing countries and also industrial design constitutes an indispensable instrument for endeavors towards development (Bonsiepe, 1973).

Over two decades after Papanek and Bonsiepe first conveyed their ideas of design for Third World societies, the social and economic conditions of these societies have not changed much, because they lacked political dimensions in their implementation.

Development of industrial design in Newly Industrialized Countries depends on development policies of governments. These policies mainly composed of trade regime and mode of technology transfer through foreign investment policy,

and industrial structure through sectorial policies. But these policies don't give direct support to design. Consequently, the main effect of government involvement in the development of design capabilities appears to be to stimulate manufacturing firms to use industrial design as a competitive tool in domestic and international markets (Er, 1997, pp. 299).

Alpay Er has used Bonsiepe's design policy model to develop a new conceptual model that attempts to describe a specific variable, the economic development strategies of Newly Industrialized Countries governments (Er, 1997, pp. 300).

The most important part of the Er's Model is the 'Development Strategy' because it determines the developments taking place in the following design categories, and facilitates a progression from one development stage to another. 'Development Strategy' is the government policies of industrialization, trade and foreign investment.

	DEVELOPMENT STRATEGY	Sectorial Scope of Industrial Design	Industrial Design at firm level	Industrial Design Education & Research	Government Design Policy	Design Discourse
1 Proto-Design Phase	Primary Specialization in Raw Material Export. Pre-industrial Growth (All NICs)	N/A	N/A	N/A	N/A	N/A
2 Embyonic Phase	Import Substitution I (Asian NICs late 1950s and early 1960s; Latin American NICs, India, and Turkey 1950s and 1960s)	Design-oriented low-scale, low tech industries. e.g giftware and furniture for home use.	Self-formed artist-designer or architects. Outsider to industry. Design as a cultural mission.	Individual courses are created as extension to art or architecture prorammes. First ID schools in India and some Latin NICs.	ID is seen as a sort of development tool, but there is no clear policy about how to use it within an ISI framework. Finance of the establishment of some early design schools.	Articles on ID as a cultural phenomenon appear in art journals. Design is an image of modernization.
3 Emergence Phase	Import Substitution II (Latin American NICs, India, and Turkey 1960s and 1970s)	Design-oriented, large-scale, investment-driven industries. e.g. furniture for home ad, office use, ceramics and some basic consumer goods.	ID as a tool of 'imitative' product modification. Individual designers employed by firms.	First generation ID teachers with art, architecture degrees or from foreign countries. 4 or 3 years ID degree programmes.	Finance of the ID education at university level. Scholarships for postgraduate education in advanced countries.	In architecture, interior and graphic design journals, articles written by industrial designers dealing with ID as a aseperate discipline.
4 Development Phase I	Export Promotion I (All Asian NICs 1960s and 1970s)	Investment driven, standard technology industries, e.g. household appliances and most consumer goods.	In-house ID teams. ID as a tool of systematic product differentiation and adaptation on the basis of product modification (redesign). The recognition of ID as a competitive tool.	Second generation ID lectures with mostly postgraduate degrees from advanced countries.	Design groups are incorporated into government agencies in some NICs such as small scale industry promotion, but there is no overall design policy.	In related design journals, special sections or issues on ID.
5 Development Phase II	Export Promotion II (Asian NICs, Malaysia early 1980s) Liberal Trade Policies (India, Latin American NICs, and Turkey)	Specialized export industries e.g. consumer and, business electronics, sports equipment etc.	In-house design teams + use of design consultancy firms. Design as a marketing factor.	Postgraduate ID courses. Faculty staff with professional experience. Localization of ID education starts.	ID is incorporated into some government policies such as export promotion.	Same as above. But ID discourse is differentiated from the others.
6 Take - off Phase	Export Promotion III (deepening) (Asian NICs 1980s)	Investment-driven, relatively more capital and technology-intensive sectors. e.g. capital goods such as transport vehicles	Large specialized ID departments. ID is recognized as a part of corporate strategy.	Specialization occurs within design like transportation design. Study programmes get a strong theoretical input.	ID is recognized as a part of a national competitive strategy.	Specialized magazines dedicated to ID.
7 Maturity Pase	Global Strategy (Korea...? since the early 1990s) ...?	New product development is practised in all major branches of industries	Design as a leading force in company strategy. Product innovation.	Differentiated and fully equipped institutions. Courses contain scientific lecture programmes.	ID as an element of innovation is part of industrial culture. Design centres run by professionals.	Books on ID are published dealing with standard practices, history, theory.

Table 2.1 Development Stages of Industrial Design in Newly Industrialized Countries (Er, 1997, pp. 301)

'Sartorial Scope of Industrial Design' manifests itself in the nature of industries in which industrial product design is intensively practiced. Through this category, it is possible to trace the unequal development pattern of industrial design across industries in relation to development strategies implemented (Er, 1997, pp. 300).

'Industrial Design at Firm Level' manifests itself in the nature of industrial design activity such as its role, integration into a firm's structure and strategy. Since design is a corporate activity occurring within a firm structure, this category serves to depict the changing function and organization of industrial design in relation to development strategies (Er, 1997, pp. 300).

'Industrial Design Education and Research' manifest themselves in the development of design education and research at university level (Er, 1997, pp. 300).

'Government Design Policy' manifests itself in actions taken to integrate industrial design within industrial development strategy, promotion programmes, and in the finance of design events (Er, 1997, pp. 300).

'Design Discourse'—as in Bonsiepe's model— manifests itself in the propagation of design awareness (Er, 1997, pp. 300).

With the help of these categories, the emergence and development of industrial design in Newly Industrialized Countries s can be described as a process with seven stages: the 'Proto-Design Phase', 'Embryonic Phase', 'Emergence Phase', 'Development Phases I and II', 'Take-off Phase', and 'Maturity Phase'.

Amir also suggests another formulation of the concept of design for the Third World should begin from an understanding of the complex interrelationship between design and social, cultural, and political factors (Amir, 2004, pp. 69).

Amir explains that how design can evolve from an individual activity of proximate designers into an "object" of politics by understanding the political economy of design. This begins from the notion of design as a process of creating artifacts that have economic value. In the aggregate, the economic value of design produces a considerable impact on economic systems. This economic significance brings design into the political arena in which design is situated as a public policy object (Amir, 2004, pp. 69).

According to Amir there are two good reasons for discussing design policy in Third World countries. First, Third World governments recently have shown an increasing awareness of design. Second, the endeavors to bolster design activities in Third World countries are motivated by the idea that design is a strategic tool for business and commerce (Lorenz, 1990) and thus important for economic growth.

Contribution of design to economy of countries can be clearly seen in Japanese and South Korean cases. These cases made the governments of developing countries to take attention to design policies. As Sulfikar Amir emphasizes, today we can see industrial-oriented design policy related with promotion center, design institutes. Like Malaysia Design Council, Indonesian Design Center, Japan International Cooperation Agency and the Japan Design Foundation, Product Development and Design Center of the Philippines, Office of Product Development & Design for Export, National Institute of Design in India, Artesanías de Colombia in Colombia, Oficina Nacional de Diseño Industrial (National Office of Industrial Design) in Cuba, Mexico Design Promotion Center, Brazilian Design Center, SABS Design Institute in South Africa.

Amir summarizes the factors of policy orientation, policy subject, and policy agency in three phases. First, economic interests characterize the orientation of design policy in Third World countries, which treats design as a strategic tool for industrial competitiveness. Second, since design policy is aimed at improving industrial competitiveness, it is very obvious that the subjects of the policy are industrial corporations. The important feature of design policy is to encourage those corporations to utilize design more intensively in product development and innovation processes. Third, even though some models of design policy emerge from the initiatives of non-governmental groups, the role of government in design policy undoubtedly is central and vital because the government conceives and approves design policy decisions, and provides financial support.

Design policy appears to be serving industry's needs to increase its competitiveness in the international market, it

overlooks local people in terms of alleviating poverty and fulfilling their basic needs. Design policy focuses heavily on questions of how to utilize design more intensively in industrial production.

As mentioned before Buchanan defends that design is for people so design policy in Third World countries should be revised, which has been heavily focused on competitive economic purposes.

Amir emphasizes that the social and economic problems of Third World societies cannot be solved solely through the materiality of design, such as creating low-cost products using local material, charity design, and the like. What underlies the problem is a structural condition that needs to be solved through a structural solution. This is the reason why the discussion of design policy is relevant because it involves political factors in its implementation.

Design policies in Third World countries are mostly aimed at increasing the competitiveness of industrial products. This sort of design policy, however, overlooks the unfortunate social and economic conditions of Third World societies. Human-centered design policy centers on people's social and cultural realms by incorporating participatory approaches in determining design policy outcomes. The industrial-oriented design policy seems to undermine the precariousness of foreign debt that most Third World countries face. Indeed, foreign debt is a very crucial problem, but the effort to cope with it has commanded too much attention, while the actual needs of Third World societies have been neglected. Making design more socially, economically, and culturally useful for Third World societies through human-centered design policy is worth the effort.

Owen (2004, pp. 3) also thinks the solution of this problem is connected with design policies and decision making process. Decision makers will need the best of creative thinking from the science community—and from a design community also prepared to contribute. In the not-so-distant past, politicians could make major errors of judgment without earthshaking consequences. Uninformed decision-making simply is no longer tolerable. Scientific advice must be integrated thoughtfully with the full range of advice given. And design advice must be similarly sought and incorporated.

3. New Business Models

Clayton Christensen developed the theory of disruptive innovation research-products or systems that create entirely new markets. Christensen justifies that companies can generate growth and satisfies social and environmental stakeholders through a "great leap" to the base of the economic pyramid (Christensen, 2002, pp. 51).

This kind of environment created millions of jobs, generated hundreds of billions of dollars in revenues and market capitalization, and raised standards of living by making available cheap, high-quality products.

As Clayton Christensen suggests developing countries are ideal target markets for disruptive technologies and he gives two reasons for this idea. Firstly business models that are forged in low-income markets travel well; that is, they can be profitably applied in more places than models defined in high-income markets.

After the World War II Japan economy and industry was almost destroyed and the country was very poor. Japan used the disruptive strategies as a national strategy of national economic development. This strategy make Japan economy one the biggest economy in the world.

Honda is one of the significant cases of the Japan success. Honda began selling motorized bicycles in Japanese cities that were rebuilding from the ruins of World War II and now Honda is one of the biggest leader firms in the motorcycle market. The basic factor that took Honda to this place is the disruptive strategy based on selling products in low prices. By this way Honda after satisfying needs of the markets in Japan, in sixties Honda entered the US market with low prices which was dominated by Harley Davidson. Honda caused a big competition in the market.

Another good example is Chinese firm Galanz and its product microwave oven (Christensen, 2002, pp.53). Galanz used national needs to make difference in mature and shrinking microwave market. Chinese have small kitchens and the existing microwaves had been designed to fit into the homes of West. So these products were not adequate for Chinese

houses. Galanz used this gap in the market and Galanz's domestic market share rose from 2% in 1993 to 76% of a much larger market in 2000.

Moreover it began to disrupt the microwave-oven markets in developed countries. By 2002, its global market share was 35%. Galanz has not been content to rest on its accomplishments with one product. In 2000, the company launched an effort to replicate its disruptive success in the home air conditioning industry.

Galanz's successes is basically depend on finding needs of the people of this geography and using disruptive strategy fulfilling these needs such as creating a simple, energy-efficient product at a price that was affordable by China's middle class and small enough to fit in their kitchens.

Prahalad and Hommond (2002, pp. 48) also emphasize the potential of developing countries offer great economic possibilities. The needs of these societies haven't fulfilled so there is great potential in the markets of these countries.

Prahalad and Hommond suggest that in recent years some of the developing countries like China, India, Brazil, and, gradually South Africa grow vigorously. This medium creates jobs and this creates wealth and by this way hundreds of million new consumers into the global market place. This will cause more stable economies. Furthermore multinationals already successfully do business in developing countries. Prahalad and Hommond state the factors that help the firms to create new businesses in these countries. These factors are important because there is a common belief of it is hard to create new businesses in developing countries.

Prahalad and Ramaswamy (2003, pp. 13) emphasize that there is big potential at the base of the pyramid. In contradiction to lowness of individual incomes, power of poor communities is actually quite large. This is because it isn't too hard to create new businesses in developing countries. Likewise, the belief of poor are too concerned with fulfilling their basic needs to be again in correct, in real the poor often do buy luxury items. For example, in Turkey poor people also have very expensive cell phones. Furthermore Prahalad and Ramaswamy state consumers at the bottom of the pyramid pay much higher prices for most things than middle-class consumers do. All these factors make the medium available for industry.

Again there are several advantages of creating new businesses in developing countries. It can also be surprisingly cheap to market and deliver products and services to the world's poor. That's because many of them live in cities that are densely populated today and will be even more so in the years to come. Another advantage is that half these consumers now served primarily by informal economies. Prahalad and Hommond emphasize companies that operate in these areas will have access to millions of potential new customers, who together have billions of dollars to spend. Also there is another gap in the market. While the rural poor are naturally harder to reach than the urban poor, they also represent a large untapped opportunity for companies. With the help of new technology accessing to these rural areas are getting easier and promise to become an inexpensive way to establish marketing and distribution channels in these communities. Good news is the poor communities are ready to adopt new technologies that improve their. New Technologies are also spur further business model innovations and lower costs even more.

Despite the saturated existing markets of the developing countries are in the earliest stages of economic development, growth can be extremely rapid and haven't satisfied yet. Although the requirements of this market are low priced, high quality goods, the enormity of the market makes the profit margins high. The needs of these markets should be analyzed. R&D units should be set up in developing countries that are specifically focused on local opportunities. As we have seen in Granz Microwave Owen case cultural characteristics and local needs are very important factor for finding a gap in the market.

In new business environment there is need of new point of view that satisfy the personal needs of the consumers. In this contend matured markets of developing countries offer great economic opportunities. The needs of these markets surely related with the cultural characteristics. As we have seen in the Granz Microwave owen case. Prahalad and Ramaswamy suggest that these markets offer great opportunities to Multinational Corporations, national corporations who can analyze the needs of this geography much more effectively can satisfy these markets (Prahalad et al, 2002, pp. 51).

Cultural characteristics are very important in defining the needs and desires of consumers. This is why in traditional marketing strategies, products are shaped according to the market conditions. The global corporations like Coco Cola, Burger King, and Mc Donald's also shape their services according to the conditions of the market. Cultural necessities play big role in this stage.

Mehmet Asatekin explains products of same physical needs have different formations in different cultures. In these differentiations we can see the cultural characteristics of the culture and heritage (Asatekin, 1997, pp. 100).

In traditional marketing strategies cultural necessities play big role in adaptations of the existing products. But in today's business environment this is not enough for competition and making difference. Customization of the local needs play more important role than product adaptations (Çakıroğlu, 2005, pp. 81). De Souza also emphasizes the importance of culture as "culture is a new dimension in competition" (De Souza, 2004).

Researches of the international corporations show that cultural differences will be one of the important factors shape the design trend in near future (ICSID, 2002).

Another important point is the definition and limits of design activity in new business environments. By the help of the new technologies borders of the industry, products and services blurring and expanding. The nature of the products and services are changing. In this manner differences between products and channels are blurring.

The Base of the Pyramid (DBOP) Project held by Illinois Institute of Technology, Institute of Design is a good example of this situation. The project focuses on the Base of the Pyramid in India.

This is an initiative to develop human-centered design strategies and concepts for new products, services and businesses capable of generating sustainable economic improvement in the lives of people living in the vast base of the global economic pyramid (Whitney et al., 2005, pp. 41).

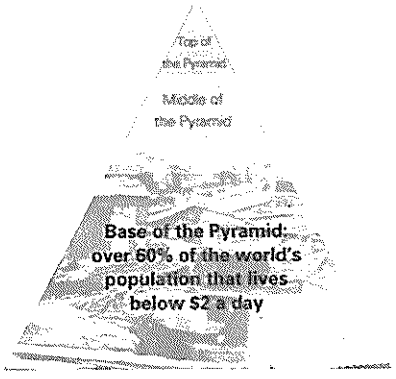


Figure 3.1. Designing for the Base of the Pyramid Project, Pyramid of world income (http://www.id.iit.edu/profile/gallery/design_for_BoP/)

Analysis of these businesses and related activities led to several design criteria that helped guide us towards solution concepts. Concepts that meet these criteria should all work together to improve not only living conditions, but the health and sustainability of local economies (Whitney et al., 2005, pp. 44), (http://www.id.iit.edu/profile/gallery/design_for_BoP/).

Criteria	Concepts						
	GuildNet	VendorSpace	Mobile H2O	LaundroFast	JobShop	Skill Registry	StepOne Homes
Access to credit	⊗	⊗	⊗	⊗		⊗	⊗
Economic opportunities	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Transaction transparency	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Secure earnings	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Professionalism	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Land ownership	⊗						⊗
Improved living conditions	⊗		⊗	⊗			⊗
Reduce middlemen	⊗	⊗	⊗		⊗	⊗	⊗
Create viable companies	⊗	⊗	⊗	⊗	⊗	⊗	⊗

Table 3.1 Designing for the Base of the Pyramid Project , Mapping concepts to criteria

One of these solution concepts is Mobile H20 project, a new business that could provide a reliable supply of fresh and clean water to slum homes by delivery vendors on the outskirts of slum areas. Slums usually have unnavigable dirt paths, and

as a result the mode of transport varies from slum to slum, from handcarts to small motorized vehicles. Using motorized vehicle is the important part of the solution because of its effective solution to needs and conditions of the local area.

4. Industrial Design in Turkey

Turkey has been an agriculture society almost for 80 years. Turkey is at the beginning of its industrial journey when compared with developed countries. Nationally capitalized industrial investments haven't been at the expected levels. On the contrary internationally capitalized industrial investments have stimulated the industry and disciplines related to this, especially design, have gain importance. Actually industrial product design education has been given some of the known universities in Turkey for 30 years and ETMK (Industrial Designers' Society of Turkey) established in 1988. As the country industrialized industrial design discipline gets an important role. Congruity process to European Union speeds up this process. There isn't enough literature, products and services in the area of social responsibility of design. As mention before this is because industrial design is a new discipline in Turkey. Also there isn't any design policy aiming to heal the problems of country's social injustice situations. By this way design couldn't integrate to the macro-politic areas like economy and industry, design has been only used as subsidiary factor (Er and Er, 2004, pp. 16).

The private and government corporations are inactive about design because of wrong or insufficient disorientation. Some of the organizations like IGEME, KOSGEB haven't got clear perspective about design. These organizations support quality and technology, but not design (Er and Er, 2004, pp. 17).

Alpay Er and Özlem Er suggest design policies should be formed according to country's long-term economic and industrial development strategies. Before that, needs of Turkey's design and trademark development should be researched. Then design policy models in the world should be analyzed and effective strategy should be determined by forecasting. Essential mechanisms that will perform this policy and design policy should be detailed in sectoral base should be formed.

Er and Er define the basic objectives of design policy in national level:

- to obtain the importance of design.
- encourage and widespread the usage of design in sustainable competition in industry.
- To assist improving the quality of human sources with national design substructure.

The design policy should be evaluated in the view of exportation and innovation policies and it should be integrated with these (Er, Ö., 2001). Building and coordinating application mechanisms intended for design promotions and inducements are critical for performing design policies. Ministry of Industry and Commerce, Ministry of State responsible for export commerce and Ministry of Culture and Tourism should be take part in producing design policy. Design should have important role in National Innovation System, there should be departments in the organizations (KOSGEB, İGEME, TTGV, DPT, TUSİAD, TİM, TOBB, TÜBİTAK, TSE, etc.) that is related with the application of design policy and integration other macro politics (Er and Er, 2004, pp. 20).

5. Exploring Cultural Characters In The Context of Competition and Making Difference Through Arçelik Turkish Coffee Machine "Telve" Case

Arçelik introduced the Turkish coffee machine Telve to the market in 2004 with this machine, Arçelik intended to serve an industrial solution to very known traditional custom, Turkish coffee making. Telve won one of the most prestigious awards in design, iF Design Award, in product design category. By this way, Telve has brought standardization and measurability which is very important for acceptance of Turkish coffee in international markets.

The tradition of Turkish coffee is not only broad in Turkey but also common in close regions around Turkey, like Arabian countries and Greece for centuries and the rituals and tools of this custom haven't changed for ages. Turkish coffee making is commonly available in small communities like in houses and coffee shops. That is because traditional Turkish coffee making takes too long to cook for letting its aroma released and small amounts of coffee can be cooked at once. This

makes this tradition collapse in small communities. By this way this tradition couldn't find place in contemporary life styles and business. In today's business environment coffee making machine market is dominated by western style coffee making machines and there are plenty of prestigious firms in this market. The competition in this market is severe. In this contend, Telve has made difference in competition, but it has also made a contribution by giving a solution to this region's traditional needs and tastes. In short, Telve has filled the gap in this market.

Arçelik has protected the R&D investments in this project with several patents. Turkish coffee machine Telve has patents in cook-sense technology, spin-jet technology, anti-spill technology and other technologies.

Arçelik has gained big success in design and competition areas by using opportunities by combining new technologies with traditional Turkish tastes. By using possibilities of new technologies Telve has overcome the negative sides of traditional coffee making methods like length in time and disability in serving multi usage. Beside this, Telve has used traditional materials and processes which is important to get maintaince of the special taste Turkish coffee, with new technologies.

Turgut Soysal, chief of the manufacturing and technology department, explains the design process of Telve. First of all there was a survey in design team which is also the users of Turkish coffee and by this way expectations form Turkish coffee machine has been determined (http://www.turkcadcam.net/haber/2005-03-22.html).

Telve is generally found body after several brain-storming processes. After determining needs and expectations from the machine, cost and concept researches were done. After the prototype process, finally Telve Turkish coffee machine was developed. While technical department was dealing with cooking process of the machine, design team dealed the appearance of the machine. All this test process took 2.5 years and after that time Telve had introduced to the market.

By serving the needs of multi usage Telve made difference in cafes, restaurants and hotels. Moreover Soysal emphasizes that Telve is the first product in the market as a Turkish coffee machine. Soysal continues Telve has firstly introduced to the Turkish market and to the markets where Turkish population is dense.

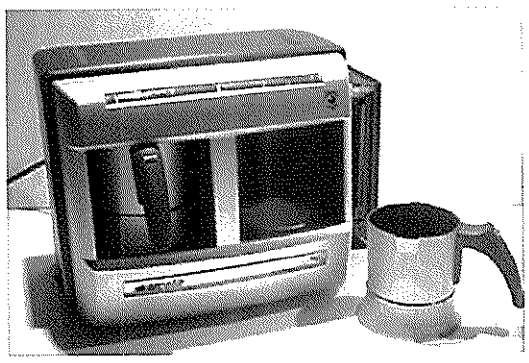


Figure 5.1 Arçelik Turkish Coffee Machine "Telve".

Telve is a very special product by the means of contribution to the traditional coffee and coffee making as a cultural value as an industrial comment. Another issue of the awareness of Arçelik in contribution to the cultural values is its partnership with Kuru Kahveci Mehmet Efendi which is the oldest coffee manufacturer in Turkey. At the end of this partnership some of the functions of Telve have been re-developed (http://www.sabah.com.tr/2005/03/21/eko112.htm). As a leading firm in Turkish coffee Kuru Kahveci Mehmet Efendi makes great opportunities to Turkish coffee culture and in this contend Telve Turkish coffee machine by this consortium with Arçelik.

Furthermore, Telve has an important role not only for filling the gap in the market but also for creating a competition medium in this market. After Telve's success another electrical machine manufacturer Arzum also developed Turkish coffee machine called Kahwe. The competition in 450 million dollars small house appliances market had become active. According to the data of the Industry and Manufacture Union of Small House Appliances (KESID) total export of one year is over 400 million dollars (http://webarsiv.hurriyet.com.tr/2005/02/13/599161.asp). There are 30 firms in this market and 8 of them are export firms. Arçelik exceeded the objects of trade in first 6 months. This success activated other manufacturers in this market.

6. Conclusion

Radical solutions to the development of the Third World countries can be achieved entirely by long-term planning. Weaknesses in democratic structures in these countries, and political and economic instabilities make it difficult to undertake progressive actions towards resolving these issues. Political and economic dependency to the first world countries makes this problem even more complicated.

Increase in work force and the development in the industrial activities will reduce the economic and therefore political dependencies of these countries to the First Word countries. This will create more stable political and economic structures and eventually it will improve the quality of life in these countries. The important role of the decision makers in this problem can not be controvertible, but industrial and manufacturing areas that are solidly related to the economical and social development of a country are also very important. In this way these areas are as responsible as decision makers, health, education and cultural areas. At this point design with its connection to industrial and manufacturing areas has an important role.

Most of the Third World countries are at the beginning of their industrialization adventure. Connected to this situation there is no structuring and consciousness in design area. Even tough if there is any structuring and consciousness they haven't got much effect on decision making process. Design researchers, design educators and design professionals have responsibility in developing effective design policies.

Design policies suggested by Owen, Amir and Er are worth for attention. Er and Er explain the national design policy criteria related with Turkey's conditions. Beside these policy models new business models of Christensen and Prahalad which is concern with joining labor and sources of Third World to the world's economy worth for pay attention.

Today maintaining success in business environment is very difficult. Competition is intense and traditional methods can not offer solutions to the problem. In this new business environment success occurs in result to state of the art innovations. Design and new technologies are the new actors of making differences.

Besides the saturated markets of the first world countries, markets of the third world countries offer new opportunities. Distinctions between products, services and industries is blurring with the help of new technologies. Alternative business models are searching the ways to add value to product/service cycle. It is possible for such new models in Third World countries to fulfill the needs of the market if they utilize their own resources and adding a furthermore value to their economies. In this sense cultural characteristics play important role in customization and fulfilling the needs of this unsatisfied market. Prahalad suggests that these markets offer great opportunities to multinational corporations. But this does not end the dependency of Third World societies to the First World societies in economic and politic areas. This kind of solution can only make new job opportunities and support the industry in these countries. Effective solution is to use these suggested business strategies and models to develop national industry and business. Design plays key role in making differences in fulfilling the local needs of this geography. As we have seen in South Korean and Japan cases national industry, design policies, business and design strategies can give an adequate solution to this problem.

In Arçelik Turkish Coffee Machine Telve case we have seen satisfying cultural needs with successful usage of technology and design can make difference. Economic success of Telve shows the success of national design and industry.

The social and economic problems of the Third World countries cannot be solved only by focusing on the material aspects of design. These solutions are not sufficient to tackle the problem entirely. But these solutions are just like castles of sands. Effective solution to this problem is the design and business strategies that will add value to economic structure of a country. Arçelik Turkish Coffee Machine Telve has gained success in material aspects of design but more important than this it adds value to economic structure of the country. Furthermore this will increase with the export of Telve.

The problem is difficult to solve and it needs high ethical values. Individual progress isn't independent from social progress. That's why design is also "responsible" from solving the problem.

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DESIGNER AND CONSUMER AS VICTIMS IN CONSUMPTION CULTURE

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Abstract

Products are the solutions of a long development process in every industry that occurs under quite violent circumstances and technology. The early problem can be shortly summarized as "the methods of production for increasing the production in quantity and quality". But it has been soon realized that solution of the producing problem is not sufficient to make the economy last and to keep the economy busy. This is the beginning of a new era that's pointed out the customers which is called today: marketing.

That new step was previously the cause to help the producers to keep production alive in all markets. Therefore in this case existing and potential customers were getting considered formerly. Whereas, a new problem had also appeared: The use of environmental supply sources and legacy products that were replaced by recently produced products, brands or models and their remains.

This paper takes attention to victims of design which turns into a tool for production-consumption cycle, and of design products which are imposed as 'objects'. Furthermore, it aims to discuss how design can be used for the sake of social benefits, instead of encouraging consumption.

Introduction

Design can not be accomplished without interaction with material and production technology as well as form, function and aesthetical concern. In the previous century new forms in design have been derived thanks to development of material forming methods. Adaptation of new material and improvement of production methods influenced the design directly and positively. Innovation is attained by new ideas and technological possibilities.

Mass and flexible production, continuously progressing technology, globalization and escalating competitive market are the conditions manufacturers have to adopt themselves for. Technology is also the factor which keeps competition alive. Technology is presented as a 'trend' and the product which has new technological features are imposed to the consumer. Technology and design are 'instruments' to provide production and consumption balance. Consumption is attracted by defined or exposed yearly trends. The product which has recent technology is to be a status symbol. Imposed meaning of the product and the social aspect the consumer acquires by using it are important factors for preference. Although technical features and technology of product are emphasized on marketing, consumer is more interested in 'status' he will acquire.

Long and various studies have been made on what and why the human consume, why he prefers more expensive ones of similar goods rather than the cheap ones even if they have similar qualities. In today's understanding of consumption, increasing importance of design and signature of designers and reflections of this on production is remarkable. Why do some commodities turn into 'desire objects' suddenly? How does possessing these products make people feel more different than or superior to others? The answers of these questions have been probed by sociologists, psychologists, consumption researchers and marketing authorities. Objective of this paper is discussing the effects of design and technology on excessiveness and addiction of consumption. In addition, it is aimed to think on ecological and ethic problems caused by this addiction, to discuss responsibilities of the designer who we can not separate from production process and finally to offer solutions.

First, consumption theories are examined in order to understand consumer behaviour. These theories help us explain consumption habits. A survey was applied to determine the point of view of interior architecture students about design and technological products, brands and environmental sensitivity. Fourth grade interior architecture students were intentionally preferred because they were ready to be considered designers. Second, the answers were inquired to find out the effects of innovation and design on consumption.

Consumer, Technology and Design

We have basic requirements to live and we first buy the goods which have consumption priority. After we have consumed our basic requirements we buy some goods which we think increase our productivity and occasionally we buy some goods just to enjoy them. Maybe if we have high income we can buy the goods "just to enjoy" more regularly. This kind of consumption is basic and the motives are easy to understand. However, it is complicated to explain consumption motives and methods design objects and technological goods. Design objects and technological goods are not always consumed as basic requirements. Classification of that kind of consumption as 'symbolic' and 'conspicuous' is helpful to explain.

Marketing theorist Odabaşı (1999:18) states 'symbolic' and 'conspicuous consumption' as:

> Conspicuous consumption is based on comparing yourself to others. Consumption is like a mirror to reflect who and what we are (for instance, leisure activities and consumption of related goods and services). However, symbolic consumption is the most widely mentioned kind with its identity forming dimension today and it is defined as the consumption style of post-modern culture. This kind of consumption is distinguished by paying extreme prices for symbolic benefits.

After the Fordist period of the 1930s when mass production and standardization evolved, wide markets were required, but consumer expectations were neglected, Post-Fordist period began when variety of products were increased, consumer expectations were considered, target consumers were defined, services were improved and life styles were presented to consumers. Popular culture identified with consumption culture, and brought up an understanding that imposed the necessity to consume permanently for self expression. In today's culture, people exhibit their identity by their possessions and by what they do. People are supposed to consume more and more to become happy and show their 'toys' to other people for social prestige. As Baudrillard (1997) mentioned, the recent consumption concept is ostentatious rather than meeting people's needs. The products that you consume, inform about your social class and status and you can differentiate through objects you use. 'Social class and social roles are the important motives that determine which identity an individual should live with and what he should do. Consumers who do not or can not consume the way demanded and expected are named and labelled as unsuccessful or loser.' (Odabaşı 1999:146-47) In order to climb the steps, exhibiting the purchasing capacity through increasing consumption is essential. Thus, the difference between social classes will vanish seemingly. People believe this because of the encouragement of commercials and mass media, and they assume to belong to a higher class with the help of products they possess. However, only the objects can be possessed and not the status. Thus, the meaning of products becomes more important than knowledge and culture.

It was observed in a factory by engineers that, the workers who are paid the minimum wages change their mobile phones very often. Workers buy second hand products because they want to have new style mobile phones. They behave similar to the society in which they live so as not to stay behind it. Another sample is rather thought provoking. According to the results of a student identification form in a high school in the outskirts of Istanbul, 90 percent of students have mobile phones, but 60 percent are unhealthy as a result of inadequate nutrition (Çakmakçı 2006). According to the survey applied in H.U. and M.S.G.S.U. to fourth grade interior architecture students, 56 percent of the students were disagree the proposition 'I continuously follow the innovations and so I change my mobile phone very often'. Nevertheless, 67 percent of the students bring out that they will change it if the product becomes unwieldy. [1]

[1] H.U.: Haliç University and M.S.G.S.U.: Mimar Sinan Fine Arts University.

It is widely mistaken that people obtain differentiation or superiority in society and are able to create social distance through what they consume. People try to define their identities through the designer of design object they buy, and through the image, -such as freedom, prosperity and nobility-,given by the object's commercial presentation on mass media. They also buy accessories to personalize it. Actually, people purchase the life style and even the identity which was offered with the product. For example, 49 percent of H.U. and M.S.G.S.U. students have stated that they consumed certain brands due to their sympathy for that brand. However, it is remarkable in terms of the importance of personalisation that, 80 percent of the students pointed out that they will not buy a mobile phone which is used by the majority.

Sociologist Yaraman explains the sociological transformation through comparisons of modern and post-modern society, and discusses the changing personality characteristics via survey she applied on university students and young people from Istanbul's outskirts. Yaraman (2003:78-9) states that:

> ...narcissist tendency is multiplied while the increasing importance of image combined with the requirements of society, and therefore brand consumption appears as a 'cure'. Brand can not be accounted for only as a consumption object, it is also conducted as a tool for adaptation to society while the permeability between social classes could be so fast in actual process.
> ...especially the classes that are culturally overwhelmed by modernity constitute the part of society hoping for help from brands.

The survey Yaraman (2003) performed also indicates that brand can not be undervalued. While 20 percent of young people did not consider brand to be important, over 63 percent revealed during the survey that they carry branded goods on themselves. Furthermore, 44 percent of H.U. and M.S.G.S.U. students stressed that they sometimes carry or wear expensive brand products. AC Nielsen's Global Purchase Influencers Report (2006) shows that the brand name/reputation is important to help making final decisions, particularly about purchasing cars (46 percent) and mobile phones (38 percent) in global average.

Sociologist Thorstein Veblen (1899/1934) who studied differences of social classes relating to consumption, mentioned in his book "The Theory of The Leisure Class" dated 1899, that prosperity could not be a status symbol by itself and therefore prosperity should be utilized to make someone jealous through conspicuous attitude.

Ritzer (2001:217) argues Veblen's theory in terms of two aspects under 'hyperconsumption' conditions of our times. Goods were highlighted during the period which Veblen had lived in thanks to Industrial Revolution. Yet, according to Ritzer, goods can not be considered apart from conspicuous leisure in recent aspects, such as casinos, cruises, theme parks, entertainment and "retailtainment".

Ritzer (2001:217) also argued that the new meanings of consumption are: '...people do not simply consume commodities; they also consume the means of consumption. Another basis of invidious distinction is the places in which one consumes. Thus, the means of consumption are stratified and participating in those that have high status yields higher status for the individual.'

Veblen's tricle-down model (1899/1934) that states the connection between the classes through consumption and its effects on fashion diffusion are important in terms of understanding the creation of innovation. According to the model, the new status symbols such as clothes and technologic goods which are assumed by the high social class are imitated by the low social class. Thus, when the high social class is imitated, they start to seek 'different' objects or styles. These attitudes provoke each other and this provocation is a motive for innovation. In addition, middle class has both imitating and differentiating motives. However, this theory was criticized about which motive is used as priority by the middle class. It is not incorrect to say that lower class imitates upper class and this causes continuous consumption.

Consumption and marketing styles have been developed which capitalize on the imitating motive of lower classes and are also defined as 'democratization of consumption'. Ikea is very notable model of this aspect with its publicized designers which enables lower classes to purchase products similar to

high class products (Ikea also indicates how to 'live' the life styles it created in catalogues).

Consumption theories and researches indicate that, –be it product or services–, consumption symbolizes status or social class of the individual. Individual intensifies his identity by the meanings imposed to the products he consumes and he reflects it to his circle. He is accepted to his circle and he gets social approval according to what he consumes. It is important for him to express his identity not only to his circle but also to himself. The individual permanently consumes to satisfy his identity which he has assigned to himself. Now he is a slave of design objects.

Sociological accounts help us understand why consumer needs status symbols. It is essential to consider and understand not only social motives but also the factors of imposing the act of consumption. Franklin (2002:91) explains how accounts that consider the influence of design are more important than accounts that focus on consumer in this statement: 'Some of these accounts buy into a structuralism and reduce the activities of designers to the logic of capitalism, or certain later stages of it. Design is conjured up by the logic to create new markets from the diversification of products.'

A product's contribution to the social identity is emphasized as a function in recent years as well as its aesthetic and utilisation functions. It is impossible for designers to ignore that. Therefore, this situation makes it necessary to create new markets and to produce new products to satisfy capitalism which constantly boosts consumption. On the other hand, a product that becomes a 'desire object' can generate extremely large markets. iPod is a remarkable sample. Levi's benefited from this desire object, by producing jeans that integrate buttons and cables so that an iPod can be controlled easily through those jeans. Designers and producers try to benefit from almost everything that becomes an icon. Well-known designers created iPod covers for victims of status who were created by the incredible consumption of this object. Success of iPod inspires new products such as: sport shoes which display calorie, speed and distance, an armchair with loudspeakers and buttons for an iPod or a cradle playing a lullaby with iPod connection. iPod market is one of the most remarkable example of today's capitalist market. Sony Walkman was also a 'desire object' of 1980s and Franklin (2002:93) criticizes that: 'does the world really need all of those (700 worldwide) versions of the Sony Walkman? Was this not exploiting people merely to increase capitalist markets?'

At this point, it is required to explain how capitalist market exploits us so easily. Kotler-Armstrong (1999:611-12) explains how materialism affects and how marketers contribute to this as:

> 'People are judged by what they own rather than by who they are. To be considered successful, people must own a large home, two cars, and the latest consumer electronics. This drive for wealth and possessions hit new highs in the 1980s, when phrases such as 'greed is good' and 'shop 'til you drop' seem to characterize the times. In the 1990s, although many social scientists have noted a reaction against the opulence and waste of the 1980s and a return to more basic values and social commitment, our infatuation with material things continues. For example, when asked in a recent poll what they value most in their lives, subjects listed enjoyable work (86 percent), happy children (84 percent), a good marriage (69 percent), and contributions to society (66 percent). However, when asked what most symbolizes success, 85 percent said money and the things it will buy.'

As new products are being served to market continuously, 'consume new one' signal is sent to consumer permanently. This is one of the recent marketing methods. Compulsory obsolescence of products and launching the higher technology -especially in the computer sector- little by little instead of directly launching the top gear, are already criticized marketing approaches. On the other hand, we are subjected to technologically renewed products continuously as if they are essential and they must be purchased. Yet, the designer knows that shelf life of products will be losing their appeal nearly within two or three years (not only in fashion sector but also in electronics and furniture sector). In addition, according to the survey which was applied at H.U. and M.S.G.S.U., only 7 percent of students explained that they would purchase the new version of their technological product even if only its shape was changed. However, 30 percent of students claimed that they would prefer the recently designed product which has the old technologically rather than the product which has the recent technology but is old fashioned. Thus it can be concluded that personal liking and newness of design could be more effective rather than technological innovations.

Even so, it is essential to emphasize why some forms stay unchanged for years along with technological renovations. Nobody knew that steel tubing cantilever chairs designed by Marcel Breuer for labour in the 1920s, would become esteemed design objects of today. Yet, we know that the chair which was not liked by labour in 1920s has been redesigned repeatedly based on the original form for so many years. Franklin (2002:92) reminds us that automobile Mini has not changed form between 1959 and 2001, and neither has the popularity of the shape of the Beetle, and its reproduction and redesign by Volkswagen in 2000. Franklin (2002:92-3) explains this as: 'The Beetle and the Mini are not exceptions and their product life is not reducible to a design principle, but involves questions of taste, style, and the assimilation of design into lifestyle.'

Under today's conditions, new meanings that are imposed to consumption make it inevitable for design to earn new meanings as well. Status and social approval motives and illusion of gaining personality by design products, lead excessive meanings to be imposed to design objects.

Technology, Design and Social Disorder

Developments on information technology and globalism facilitate vanishing of borders and diffusion of innovations. Thus, very strong changes on design and trends affect competition significantly. Producer is driven by anxiety of continual innovation or diversity and pressure of launching earlier than his competitors. He also experiences paranoia of technological deficiency or theft. All these pressures and anxieties impress the designer as well. As a consequence, products which do not have updated technology but, have been renovated through their cover design or which are presented with insignificant technological innovations as if they were highly important have started to invade the market. Consumer can not understand the technological innovations entirely nor can he know if the product's effects on the environment are harmful or not. For instance, Hi-Tech shop assistants never talk about the harmful gases that are given off during LCD TV production process. On the contrary, consumer is encouraged in order to purchase the newest because of the need to refresh the consumption cycle. Marketing methods and credit cards are very productive assistants of this cycle. Psychiatrist Tarhan (*Kredi kartı depresyon sebebi*. 2006) states that, at the first use, credit card causes mental blindness and obstructs risk analysis.

Thus, designer has become a tool of global market in creating shallow innovations. Reproducing basic forms of modernism with new materials and advanced technology is a result of this. However, another factor that restrains designer is the trends of two years later which are already known today and designing in this direction is inevitable. Even a conscious consumer knows a couple of things about the trends of the next season. Should some information stating that consumers will be interested in ecological goods is reflected to trends the market will be invaded by too many ecological goods. Consumer is at ease about imbalance of earth or climatic changes, because he paid much and bought ecological product. According to the survey, while 44 percent of H.U. and M.S.G.S.U. students expressed that they do not consume products which have hazardous factors for environment, 20 percent of students explained that they have completely the opposite idea. This implies that, students do not have enough information about detrimental technologies which damage the environment.

Economical dimensions such as market share worries of producers and need for keeping production-consumption cycle stable, are beginning to cause 'status design' approach rather than 'useful design'. Design is becoming a significant weapon of this cycle. However, we may not see the very dark side of this picture. Competition is a motivational power in order to improve materials and production methods. New materials and new production methods enable designer to create new forms and products which are lighter and more elegant with better finishing. Neither the contribution of production technology to design, nor new requirements which emerge from technological innovations can be ignored. For instance, the compact disc created in 1979 led to hundreds of different compact disc shelves and created a new market. On the other hand, technology gives rise to artificial requirements -like iPod and mobile phone accessories- other than necessary requirements.

While benefits of technology make our lives easier, we should try to cope with all these complex products which have been imposed to us. Alberto Meda (cited in Fiell and Fiell 2001:21) has criticized the complex technological products:

'Technology must be tamed in order to realized things that have the simplest possible relation with man - we must reject technologically driven industrial goods that have no regard for human needs and no communicative rationality'.

Dimension of design is changing gradually. Foster (2002) mentions that everything -from jeans to genes- is perceived as a design object. Home, job, face, weak personality or DNA of your children can be designed as well. Design as a reflection of narcissistic personality, is an accomplice of production-consumption cycle. However frightening this account is, we know how effective social life and marketing methods are on diffusion of innovation. Moreover, 'possession of something' in general is a factor that decreases distance between the thing and human'. (Bilgin 1991:113) As technology is spread, people in every class have relations with technological products and fear diminishes. The mass of people using technological products encourages other people.

Fear of technology is being replaced by fear of staying behind the technology. As well as the worries of the designer not to fall behind his rivals, consumer worries about buying product or thing with old technology and he may spend more with the feeling of having the newest. Because staying behind, is a very heavy concern. New technological products are imposed through the media continuously. High tech is always expensive, but if you will buy a new thing you must buy the one with the newest and highest technology .Because the old ones belong to technology garbage. Paying more for a product that will be a trash someday is inevitable. However, nobody wants to have a trash from the start.

Quality is defined as 'level of meeting the needs' and from the quality point of view, technological 'renovations' are bringing two important risks into our lives. First, the individual may not keep in step with the new requirements generated by the technological 'renovations' and his quality of life can be affected negatively. And second, buying the newest technology only to prevent oneself from staying behind means buying something which has features that will never be used and/or that will never meet what is really needed. In other words, that means 'money for nothing'. Result is a lot of damage on quality of life in many ways. Furthermore, high prices are paid to buy identities because of social concerns. The mistake in believing 'he who pays more is superior' and social classification formed by the objects consumed and showed off, causes social divisions.

The mobile phone is one of the objects that reflect the technological developments best, now almost all new versions are also cameras as well. Misuse of this wonderful feature –such as blackmailing- has even caused suicides in Turkey. According to survey conducted by Jee Hyan Ha and presented in American Psychiatric Association's meeting in Toronto, South Korean teenagers who use their mobile phones more than 90 times per day are more timid and depressive than the ones who use theirs at least 70 times per day. Another well-known fact is; computers that are the symbols and main tools of information era, are causing addiction through internet and video games, triggering antisocialism or social violence and even causing deaths because of by playing video games too long –such as for days.

As well as the social problems caused by technology and technological products, there are also environmental problems and these two can not be considered independently. Continuously regenerated technology and design cause bought products to be used for shorter periods. This means more production, more waste, more use of energy and pollution. While '5 percent of the world population is using 25 percent of all world resources, they also pollute at same levels. Everyday, more than 1 million tons of toxic waste is given to environment. 30 percent of natural resources have already been lost.' (Odabaşı 1999: 181) If the aluminium of 32 billion beverage cans thrown in garbage in the USA during the year 2002 could be re-used, it would be possible to obtain needed metal resource to manufacture all trade planes on this planet.

Despite this, a research conducted in Norway determined that 74 percent of subjects prefer simple life to increasing income and materials with increasing stress. (Elgin and Mitchell 1977) More importantly, for protection of our environment, countries should put sanctions in order. According to Kyoto Protocol, signed by 129 countries – except USA, producers must let consumers know how they produce and its effects on the environment.

Nowadays, there is a very strong relationship between designer's success and his ability to use technology properly.

He must be able to keep up with new production techniques, new materials, research and development studies, and be able to evaluate consumer trends and life styles. At the same time, designers should obtain information about ethical values and about protecting environment, too. Firstly, designing products which are environment-friendly, recyclable, and that can be produced with less energy must be aimed. Instead of focusing on creating new needs, meeting the existing needs must be focused on. Designer should be able to measure the possible damage level caused by the products they design, even though he can not obstruct the principle of the consumer being a victim of consumption. For instance, a designer who knows that aluminium can be recycled many times should be conscious of immorality of not recommending that material for a non-recyclable product. Also, 'design and design schools have had a profound influence over consumption by trying to improve and extend the place of art in all levels of society and not simply as a plaything of the wealthy.' (Franklin 2002:94)

It would be healthier to show designers the ways to design products which can be produced with less cost and which are more functional, encouraging longer usage, more ecological, harmless for nature (such as Levi's organic jeans), upgradeable by small and cheap additions (such as upgradeable home appliances). Design schools should teach ecology and consumption culture. At the same time, the consumers of the future should also be educated from the elementary school years on.

	GSU	IU	MU	MSGSU	BSU	IBUN	MLTU	YU	Outskirts	Total	%
Yes	1	1	1	0	8	2	5	2	5	25	20
No	12	12	13	10	4	13	6	10	20	100	80
Total	13	13	14	10	12	15	11	12	25	125	100

Table 1. Is 'brand' important for you?
Source: Yaraman 2003:79.

	GSU	IU	MU	MSGSU	BSU	IBUN	MLTU	YU	Outskirts	Total	%
Yes	9	8	4	3	11	10	9	10	12	79	63,2
No	4	5	7	7	1	5	2	2	13	46	36,8
Total	13	13	14	10	12	15	11	12	25	125	100

Table 2: Do you carry a branded object right now?
Source: Yaraman 2003:79.

	Agree			Sometimes Agree			Disagree			
	M.S.G. S.U.	H.U.	av.	M.S.G. S.U.	H.U.	av.	M.S.G. S.U.	H.U.	av.	Total
	%	%	%	%	%	%	%	%	%	%
I continuously follow up innovation so I change my mobile phone very often.	6	14	11	6	48	33	88	38	56	100
For me, new mobile phones take too much time to get used to.	13	18	16	0	14	9	88	68	75	100
I always wear/carry a product which belongs to an expensive brand.	19	14	16	19	59	44	63	28	40	100
I prefer to buy some brands because they are reflecting my personality.	37,5	55	49	37,5	34	35,5	25	10	15,5	100
The recently designed product which does not have new technology is better than the product which has the recent technology but is old fashioned.	38	25	30	31	39	36	31	36	34	100
I can not use high complexity electronic products -such as mobile phones- and I don't need to use their all functions either.	44	21	29	25	41	35,5	31	38	35,5	100
I am reserved about improving technological products. It is hard to change my unwieldy product.	6	10	9	31	21	24	63	69	67	100
I'm interested in harmful technology and I don't buy products which are not environmental.	63	34	44	25	41	36	13	24	20	100
My camera/mobile phone is the answer to my need but I want to buy newer.	31	21	25	6	29	20	63	50	55	100
I will buy the new version of my technological product even if it is renewed only formally.	7	7	7	0	17	11	93	76	82	100
Nobody uses the 'x' brand mobile phones in my neighborhood. But if majority used it, I would buy it.	6	10	9	6	14	11	88	76	80	100

Table 3: The survey conducted on fourth grade interior architecture students.

Conclusion

Almost everything –purchasable or not purchasable– is a tool of today's consumption culture. It is known that symbolic and conspicuous consumption leads to stratifying and, social and cultural alienation. Consumption addiction and antisocialism are also important psychiatric disorders. Created identity via consumption objects always needs revision. It is shown at the survey that the majority of students take the identity issue into consideration. On the other hand, designer can not avoid designing for consumption-production cycle. However, designer should be aware of social disorder and environmental problems the cycle causes. According to the survey, minority of students/designer candidates are not interested in environmental goods. Although it is the thought of minority, this is a worrying result. Therefore, design schools

have a very important role to train conscious young designers. In this century, designer has a significant responsibility about designing environmental products with social consciousness.

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EAD '7

DESIGN AGAINST DISASTER: SHIFTING LIFESTYLES TO PREVENT ENVIRONMENTAL DISASTER

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Abstract :

It has been over 30 years since the prime discussion of 'basic ideas concerning the attitudes of individuals and nations towards the environment and development', at the United Nations Conference on the Human Environment (1972). Much has been argued upon environmental subjects, and nevertheless, it remains as a major topic due to its foremost importance. Issues concerning usage of natural resources, man-made environments and sustainability, living greener and so on are being scrutinized by leading scientific committees internationally. Among other interesting comments, some can be correlated to the routine everyday lifecycle of individuals: the fact that ensuring the durability of natural resources depends not only on national decisions but also on the populations' taking this vital issue into account (Brundtland, 1987 and Solow, 1992). Disaster, in a man made environment is foreseen; therefore to shift existing lifestyles by individuals can be proclaimed as a social responsibility to prevent the upcoming environmental disaster.

The profession of Interior Design is closely linked to generate lifestyles. According to NCIDQ (National Council for Interior Design Qualification) in USA, definition of Interior Design is: "A multi-faceted profession in which creative and technical solutions are applied within a structure to achieve a built interior environment. These solutions are functional, enhance the quality of life and culture of the occupants, and are aesthetically attractive." Designs must adhere to code and regulatory requirements, and encourage the principles of environmental sustainability (NCIDQ, 2004)

The main scope of this paper is to draw attention to interconnectedness of interior design and sustainability, particularly within Turkish Interior Architects / Designers. By this way it is expected to create a level of social consciousness via this close connection and to improve notice on environmental sustainability. In further advance: by altering material, product and systems around our living environments (homes, offices, etc.) the ongoing consumption trends of the society will be affected and eventually be triggered to develop in a system to be environmentally friendly. **"The object is not so much to sustain the environment itself, but the lives we can lead in that environment."** Amartya Sen, Nobel Laureate 1998, Harvard University.

Keywords: Sustainable development, interior design, lifestyle consumption.

Introduction:

Lifestyle Consumption as an Increasing Threat

Recently several academic studies have pointed out to the overgrowing patterns of consumerism particularly throughout the beginning of the new millennium. Scholars have agreed that an increasing part of the world is entering or already belonging to what could be described as the consumer society. According to the research statistics, the world's urban population has increased nearly fourfold in the last half-century, from 732 million in 1950 to more than 3.2 billion in 2006 (UN Population Division, 2006).

Within world population, there are 1.7 billion people constituting the members depicted as the **'global consumer class,'** of which are having incomes more than 7000$ worth of purchasing power parity (an income calculation for the purchasing possibility in local currency). Although ranging widely in levels of wealth, the consumer class is archetypal users of television, telecommunication and the internet, along with contemporary media culture and commercial ideologies that these widely distributed products transmit (Dobers and Strannegard, 200S).

One would assume that most of the consumer class is found in Western industrialized nations. Interestingly, almost half of them come from the 'developing' world, with China alone claiming 240 million people –nearly as many as the 242.S million in the US. The third largest 'consumer class population' is India with 122 million people, followed by Japan at 121 million, Germany at 76 million, Russian Federation at 61 million, Brazil at 58 million, France and Italy at S3 million each, and the UK at S0 million (Worldwatch Institute Reports, 2004). Even if there is an increasing gap between the few very rich and the many very poor, it is possible to declare that a materialistic lifestyle and consumer culture has become widely accessible to a progressively growing middle class throughout the world. For a brief example, in 2003 there were more private cars than there were licensed car drivers in the United States of America, and SUV's (sport utility vehicles) were among the best-selling vehicles. New houses in the U.S.A. were 38 % bigger in 2002 than in 1975, despite having fewer people per household on average (Gardner et al., 2004).

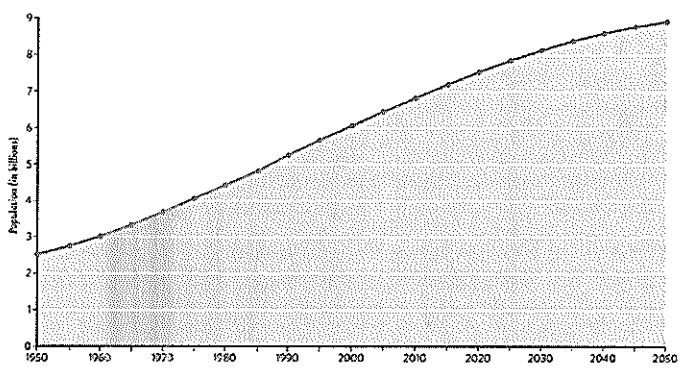


Figure 1: World Population, 1950-2050.
(Source: UN Population Division)

A number of books published since the early 1990s document an increased frustration of societies organized around consumption (Cross, 2000; Kasser, 2003; Gardner et al., 2004). On a general level of cognition, consumption is seen as an attempt to escape the boredom of everyday life (Sanne, 2002), as means to create one's own lifestyle and identity through consuming goods and services with specific social attributions. Scholars have argued that Western societies are becoming increasingly aesthetic-oriented in consumption matters by pointing to the fact that consumers are constantly searching for new fashions, new styles, new sensations and new experiences due to the companies' marketing efforts (Featherstone, 1991). This implies that consumption in the 21st century seems to be more trend-conscious and lifestyle based; products and services are potentially signaling a particular lifestyle, where individuality is displayed in an assembly of artifacts, practices, experiences and appearance. Companies and other elements of the corporate business systems are moving beyond from fulfilling customers' needs and gaining credits for exploiting their desires. The more products, systems and services take place on the markets, no matter whether needed or not, effective marketing policies become a side as a so-called 'value-creator', and the consumers seek for more to distinguish themselves from other groups or fields of society, constantly striving for additional elements to celebrate statuses and exhibit newly adapted lifestyles.

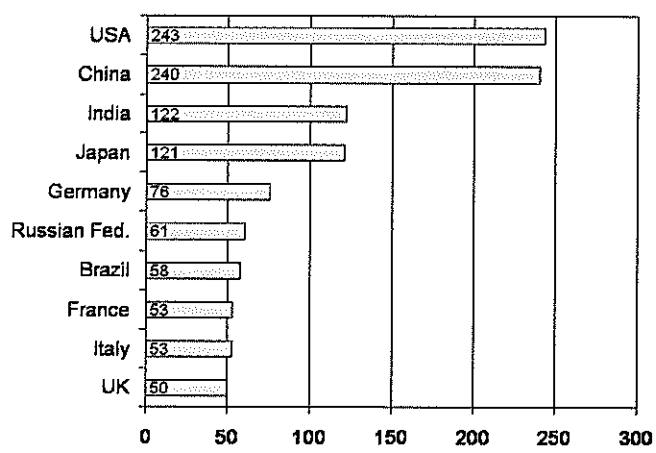


Figure 2: Consumer Class Populations by Nation (in millions)
(Source: State of the World 2004: A Worldwatch Institute Report on Progress Toward a Sustainable Society. NY: W.W. Norton.)

Undeniably, the rapidly increasing 'consumption-mania' is affecting even our current lifestyles through the pioneering consumption patterns and behaviors: the ever-changing trends based on a 'buy and dispose' process and the reduced lifecycles of products & services are ultimately manipulating the environments that we live in. Consumption is necessary for survival, but obviously it threatens the well-being of people and the environment when it becomes an end in itself. The abundant quest of consumption has fined a serious charge to world resources that is now mounting at least as fast as global consumption levels. Besides the fact that mass consumption leading to severe impact on water supply, air quality, climate, biodiversity and human health; the up-to-date effects of over-consuming can be described as poor diets, a sedentary lifestyle, obesity and a decline in social health and happiness, and more on the way.

Due to the previously mentioned arguments, this paper's point of view is to draw attention to **lifestyle consumption** as a social process; and to investigate a particular approach to alter it to a 'sustainable' direction. In this manner the need to rethink and create new physical, social and cultural infrastructures of well-being that focus on high quality of life is becoming inevitable. This paper will specifically deal with the interconnectedness of design and sustainability, and because of purposely related bonds to create lifestyles; 'sustainable interior design' will be scrutinized in order to achieve a solution. Among other fields of the design world, such as product, graphic, etc., interior design has an outstanding role towards containing sustainable lifestyles in the society. This paper will end with applicable suggestions towards the local interior design community and to the curriculum of graduate-level educational institutes.

Shifting Lifestyles with Sustainable Design

It has been over 30 years since the prime discussion of 'basic ideas concerning the attitudes of individuals and nations towards the environment and development', initialized at the United Nations Conference on the Human Environment, Stockholm (1972). For the first time nations met to consider global environment and development on the same agenda. Much has been argued upon environmental subjects, and nevertheless, it remains as a major topic due to its foremost importance. Issues concerning usage of natural resources, man-made environments and sustainability, living greener and so on are being scrutinized by leading scientific committees internationally. Among other interesting comments, some can be correlated to the routine everyday lifecycle of individuals: the fact that ensuring the durability of natural resources depends not only on national decisions but also on the populations' taking this vital issue into account (Brundtland, 1987 and Solow, 1992).

The milestone manifesto Brundtland Report (1987), 'Our Common Future', under the leadership of Gro Brundtland[1], 'sustainability' is defined as not in terms of preserving the environment itself, but the 'quality of our lives, or the fulfillment of our needs'. It contains two key concepts: The concept of 'needs', in particular the essential needs of the world's poor; and the concept of limitations forced by the state of technology and social organizations on the environments' ability to meet present and future needs. Furthermore, the 1987 Brundtland Report defined 'sustainable development' as 'meeting the needs of the present generation without compromising the ability of future generations to meet their own needs'. The idea has been advanced by Nobel Laureate Robert Solow, in 'An Almost Practical Step towards Sustainability' (1992). Sustainability is accepted as an obligatory feature: the next generation must be left with 'whatever it takes to achieve a standard of living at least as good as our own and to look after their next generation similarly'. Both Brundtland and Solow approaches reinforce each other, by giving the essence of the idea that any ingredient of a good life, which can influence and raise living standards, is taken to be potentially important.

In the 1995 World Summit on Social Development further defined this term as 'the framework for our efforts to achieve a higher quality of life for all people', in which 'economic development, social development and environmental protection are interdependent and mutually reinforcing components'. By the year 2000 with the adoption of the Millennium Declaration, and afterwards the 2002 World Summit on Sustainable Development, this definition was expanded to identifying the 'three overarching objectives of sustainable development' to be (1) eradicating poverty,

[1] Gro Brundtland, former Prime Minister of Norway.

(2) protecting natural resources, and (3) changing current unsustainable production and consumption patterns in the interest of our future welfare and that of our descendants. Recently by Heads of State and Government in the UN outcome document of the 2005 World Summit, consumption patterns and sustainability was still the uttermost topic. Nevertheless it is obvious that disaster, in a man made environment is foreseen; therefore to shift existing lifestyles by individuals can be proclaimed as a social responsibility to prevent the upcoming environmental disaster.

Designers, in this context, wear two hats: both as a consumer and a supplier. By having one foot in the 'real world' and one in the business of 'changing it for the better' the designer is in a position to develop an informed perspective on the adoption and implementation of sustainable design practices (Abeyasekera & Matthews, 2006). Shaping society by influencing on the usage of resources, selecting products or materials which are environmentally safe, and ultimately creating a certain level of 'consciousness' and implying it to our surroundings as a new 'lifestyle' or so called 'trend', are all within the capabilities of a socially responsible designer. As previously mentioned, interior design has an outstanding role to constitute sustainable lifestyles in the society. The profession of Interior Design is closely linked to generate lifestyles. According to NCIDQ (National Council for Interior Design Qualification) in USA, definition of Interior Design is: "A multi-faceted profession in which creative and technical solutions are applied within a structure to achieve a built interior environment. These solutions are functional, enhance the quality of life and culture of the occupants, and are aesthetically attractive." Designs must adhere to code and regulatory requirements, and encourage the principles of environmental sustainability. The interior design process follows a systematic and coordinated methodology, including research, analysis and integration of knowledge into the creative process, whereby the needs and resources of the client are satisfied to produce an interior space that fulfills the project goals (NCIDQ, 2004).

Sustainable Design uses methods and products that cause the lowest possible impact upon the ability of the natural environment to maintain its natural balance. Its goal is to prevent the environmental damage inherent in traditional processes of building or remodeling. By integrating considerations for sustainability with principles of aesthetics, function and comfort, sustainable design strategies enable professional designers to make sustainability possible and attractive by creating spaces that are as comfortable as they are healthy, energy and resource efficient, functional and aesthetically pleasing, and by promoting the well-being of their occupants as well as the earth (Stewart-Pollack & Pillote, 2006).

The need of sustainable design in built environments (homes, offices, any other types of buildings etc.) adhere three dimensions of sustainability: Ecological, economic, social and cultural. Interior designer's accountability for the interior environments' impact on individuals and the long-term viability of the planet should consider every design decision; weighed within the parameters of social context, ecologically friendliness, and the bottom-line impact of business economics. In this case, some professional or non-profit governmental design organizations have established guidelines and ethical codes of practice, such as IIDA[2], ASID[3], IDEC[4], and IFI[5] and so on. Designers must be prepared to demonstrate value using performance-based outcome measures. An example for one of these standards for measurement is the LEED system. LEED (Leadership in Energy and Environmental Design) Green Building Rating System provides a complete framework for assessing building performance and meeting sustainability goals. Based on scientific standards, LEED emphasizes state of the art strategies for sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality (USGBC, 2006).[6]

[2] IIDA (International Interior Design Association), www.iida.org
[3] ASID (American Society of Interior Designers), www.asid.org
[4] IDEC (Interior Design Educators Council), www.idec.org
[5] IFI (International Federation of Interior Architects / Designers), www.ifiworld.org
[6] USGBC (US Green Building Council), www.usgbc.org

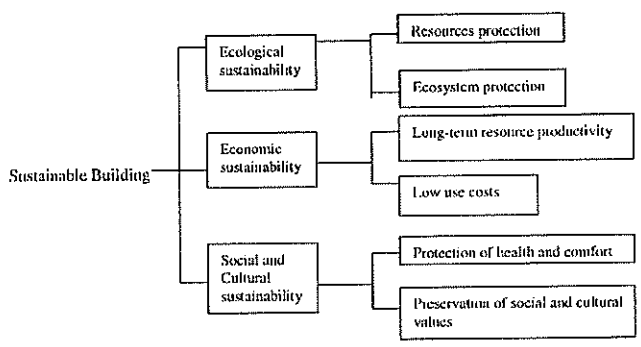


Figure 3. The Three Dimensions of Sustainable Building (Source: Kua, H.W. & Lee S.E. (2002) Demonstration Intelligent Building – A Methodology for the Promotion of total Sustainability in the Built Environment. Building and Environment 37, 231–240 [adapted from Kohler, 1999].[7]

The result attempted to obtain by using these measurement standards is increasing the incitement of growing body of affordable, environmentally responsible building and interior materials and products available to the designer and the consumer. Through a procedure called life-cycle assessment, products and even entire buildings are evaluated according to the amount of material and energy used in the extraction of raw materials as well as in the production, transportation, maintenance, and disposal of the products. Life-cycle assessment also measures the pollution and waste produced by these processes. Life-cycle costs, or the 'real' cost of products based upon this assessment, can then be determined.

Of course, whilst practicing sustainable interior design there are certain simple guidelines that any socially and environmentally responsible designer could take under consideration. To be mentioning these guidelines as a very brief summary;

• Using recycled or easily renewable, non-toxic materials for all surfaces: Materials and finishes for walls, floor coverings, ceilings and cabinetry, such as formaldehyde-free MDF (medium density fiberboard), reclaimed or FSC[8] certified wood products, bamboo, cork, or linoleum flooring, carpets made of natural materials (wool) or recycled materials, ceramic tiles made from recycled glass and other products.

• Using non-toxic, water based finishes and low or no-VOC paints (volatile organic compounds).
• Using natural day lighting (instead of artificial lighting) as much as possible.
• Using energy efficient HVAC systems, appliances, and equipment.
• Using locally available materials for transportation benefits.
• Avoiding common materials and products such as:

- Petroleum-based Products: Pesticides and fertilizers, plastics and synthetic fibers, solvents and fuels.
- Plastics
- Polyvinyl chloride (PVC)
- Products Containing Formaldehyde

There are also several mottos on promoting sustainability to obtain public interest as well as professional bodies. Quite mind capturing and easy to remember, these mottos themselves develop into principles of sustainable design. One example was published and distributed by IDEC (Interior Design Educators Council) as a 'Preliminary Teaching Manual for Sustainable Design Education', March 2006. Under the title of 'The Seven R's of Sustainable Design'; Rethink, Redesign, Reduce, Reuse, Renew, Refurbish and Recycle concepts are used to label sustainable interior design guidelines with the following explanations (IDEC, 2006):

• **Rethink:** Although design problems are contextual, complex, and multi-layered, the design process remains essentially compartmentalized, lineal, and fragmented.
• **Redesign:** Design for flexibility, durability, longevity, disassembly, and ease of maintenance. Eliminate the concept of waste.
• **Reduce:** Do more with less. Reduce or eliminate toxicity and pollution.

[7] Kohler N. (1999) The Relevance of the Green Building Challenge: an Observer's Perspective. Building Research & Information 1999;27(4/5):309–20

[8] FSC (Forest Stewardship Council), www.fsc.org

• **Reuse:** Specify products that can be used over and over again. Question the ultimate consequences and impact of new products.
• **Renew:** Specify products from rapidly renewable resources.
• **Refurbish:** Give new life to existing products and buildings.
• **Recycle:** Establish a policy to recycle all applicable waste materials.

Besides various guidelines, ethical codes, mottos, to-do lists, green product qualifications and so, sustainability and the items or concepts related to it are gaining a vast popularity amongst a wide range of business and academic activities. Sustainability seems to be spreading into a wide segment of business and academic enterprises over the globe, a quantity of other specific subject areas above and beyond interior design are setting up or integrating their foundations in accordance with sustainability principles. Derived from the same report mentioned above, some specific areas of which sustainable design can be integrated are:

• Design Studio Courses (passive/active solar, daylighting, natural ventilation, non-toxic materials, renewable/recycled/ local materials, design for disassembly, water and resource conservation, project-specific sustainable design checklists/ analysis)
• Building Structures and Systems (alternative building materials and processes and HVAC systems, passive and active solar design)
• Lighting (daylighting, energy efficient lighting solutions)
• Construction Documents (detailing of sustainable features and elements)
• Furniture Design (design for disassembly, renewable and recycled materials)
• Textiles (non-carcinogenic chemicals in fibers and dyes, biodegradable and compostable fabrics)
• Surfacing Materials (renewable and recycled materials, non-toxic materials)
• Business of Interior Design (ethical responsibility for healthy buildings and environments; social justice; strategic planning)
• History of Architecture, Furniture and Design (evolution of green design philosophies, products and processes)
• Historic Preservation (making historic buildings healthier)

The knowledge and the existing conditions established upon sustainability issues thus far clearly provide adequate confirmation that the world has reached a turning point. Obviously, a shift from our current 'consume-oriented' lifestyles has initiated; the common social consciousness has begun to arise, businesses are now demanded to be 'environmentally responsible' by numerous consents. The question is how long will this adaptation phrase extend? Shifting lifestyles may take a longer duration in the 'developing countries', since they consist of almost half of the total consumer class population, as mentioned in the beginning of this paper. Does the local sanction (if they exist), have an impact on individual endorsement? Perhaps the real environmental challenge is hidden in converting the 'lifestyle consumption' in to an 'environmentally conscious lifestyle' itself.

Local Situation: Conditions of Sanction in Turkey

The Chamber of Interior Architects of Turkey is one of the 23 chambers under The Union of Chambers of Turkish Engineers and Architects.[9] It is a public professional organization, ruled by Article 135 of The Constitution of The Republic of Turkey.[10] The article in question clearly demonstrates the aims and the objectives of the diverse Chambers:

[9] TMMOB, "Türk Mühendis ve Mimar Odaları Birliği"
[10] The Constitution of The Republic of Turkey, Article 135:
H. Public Professional Organizations
ARTICLE 135. (As amended on July 23, 1995)
Public professional organizations and their higher organizations are public corporate bodies established by law, with the objectives of meeting the common needs of the members of a given profession, to facilitate their professional activities, to ensure the development of the profession in keeping with common interests, to safeguard professional discipline and ethics in order to ensure integrity and trust in relations among its members and with the public; their organs shall be elected by secret ballot by their members in accordance with the procedure set forth in the law, and under judicial supervision.
Persons regularly employed in public institutions, or in state economic enterprises shall not be required to become members of public professional organizations.

...meeting the common needs of the members of a given profession, to facilitate their professional activities, to ensure the development of the profession in keeping with common interests, to safeguard professional discipline and ethics in order to ensure integrity and trust in relations among its members and with the public; ...

The Chamber of Interior Architects of Turkey has started its activities in 1954 as an association and became regulated as a Chamber in 1976. The Main Regulations of the Chamber have been revised many times ever since, but the current one in use has been accepted in 25th April 2006 and published in the Official Gazette no. 26149. In the Second Chapter of the Main Regulations, the headquarters and the aims of the Chamber are established. Under the Second Chapter of the Main Regulations of The Chamber of Interior Architects of Turkey, Item no. 6 demonstrates the aims of the Chamber within 15 sub-items. Issues related to sustainability are held only in Article 6 under the Second Chapter, and unfortunately there is no more than only one single item which is directly linked to sustainability issues. To be more accurate, the following item, which is the last one of 15 sub-items, is the only one "mentioning" a slight importance towards sustainable design:

> [L] Realizing studies and other necessary enterprises and activities within the benefits of the country and the public on: protecting, managing, and marketing natural resources and the growth of productivity.[11]

Giving regards to the fact that every Interior Architect, who graduated from a 4-year undergraduate curriculum of an allied university **must** become a member of The Chamber of Interior Architects of Turkey in order to maintain a professional practice within the borders of The Republic of Turkey, and Interior Architects which are not members of The Chamber of Interior Architects of Turkey are prohibited from any professional occupation related to the interior design field, the above mentioned item towards sustainable design is obviously not sufficient enough to be a guideline or even as a accurate assessment for the members. Due to the urgent environmental importance of the subject, this paper argues that as a prime organization among the Interior Architects in Turkey, The Chamber has a privileged obligation to educate, to demonstrate and eventually to regulate sustainable design issues among its community. By this close encounter the consciousness level of the members and gradually the clients, companies, and so on will be affected and, hopefully, be useful to build up a system which is environmentally friendly. As a clear suggestion, this paper offers that matters of ecological, economical and social/cultural sustainability in the built environment should be adjoined in the Regulations of the Chamber of Interior Architects of Turkey.

One other aspect of the current situation upon sustainable design in Turkey can be analyzed through the graduate education. Interior Architecture education in Turkey has started in 1925 in Istanbul State Fine Arts Academy (İstanbul Devlet Güzel Sanatlar Akademisi) known as Mimar Sinan University of today.

Over the past 80 years, many universities in Turkey have opened a variety of levels of undergraduate, graduate and doctorate level Interior Architecture curriculums. State and/

These professional organizations shall not engage in activities outside the aims for which they are established.
Political parties shall not nominate candidates in elections for the organs of these professional organizations or their higher bodies.
The rules concerning the administrative and financial supervision of these professional organizations by the state shall be prescribed by law.
The responsible organs of professional organizations, which engage in activities beyond their objectives, shall be dissolved by court decision at the request of the authority designated by law or the public prosecutor, and new organs shall be elected in their place.
However, in cases where delay endangers national security, public order and in cases where it is necessary to prevent the perpetration or the continuation of a crime or to effect an arrest, an authority designated by law may be vested with power to suspend professional organizations from activity. The decision of the said authority shall be submitted for approval to the responsible judge within twenty-four hours. Unless the judge declares a decision within forty-eight hours, this administrative decision is annulled automatically.

[11] [Main Regulations of The Chamber of Interior Architects of Turkey, Second Chapter, Item 6, Sub-Item (L)] Accepted and published in the Official Gazette (no. 26149) in 25th April 2006.

or private universities such as Bilkent, Hacettepe, Eskişehir Anadolu, Istanbul Technical, Karadeniz Technical, Marmara and so are currently continuing their educations and contributing around 500 Interior Architecture graduates every year. Each university offers a wide diversity of elective and must courses in their curriculum, but nevertheless, none of these courses are titled to ecology, green design, sustainable design or so. Regarding this information, conceivably a re-evaluation of the current curriculum is essential in due to academic units. This paper also suggests that in view of the fact that sustainability courses in undergraduate or graduate education are inevitably compulsory; universities should consider and revise their curriculums in order to meet the agenda of sustainability; which encompasses economic, social, and environmental impacts. As a brief example of the related educational premises around the world, Carnegie Mellon University offers a "Sustainable Design (M.Sc.)" degree under the School of Architecture. This program is aimed for students interested in sustainable design in the built environment. The program includes coursework in the following areas: Environmental Basics and Issues, Environmental Law and Policy; Environmental History, Sustainable Design and Development, Advanced Building Systems, Building Performance Simulation and Tools, Site and Ecology, Sustainable Engineering and Construction, Environmental Economics, Thesis/ Project Courses.[12]

As a closure, in order to succeed the real environmental challenge, converting 'lifestyle consumption' to an 'environmentally conscious lifestyle' is obligatory for our continued survival. Much, inline with this paper, 1998 Nobel Economics Laureate Prof. Amartya Sen, from Harvard University has a judgment:

> The object is not so much to sustain the environment itself, but the lives we can lead in that environment.

Among other fields of design, interior designers must deduce a leadership role for sustainable design and development. It is in the definition of the profession, that 'enhancing the quality of life and culture of the occupants' is an obligation for an interior designer. Environmental responsibility has to become and is becoming a norm in our lives, refraining from our current lifestyles based on ever-changing trends and consumerism is a vital requisite, as the global ecological crisis is a widely accepted reality. Sustainable design not only has immediate and far reaching impacts upon resource depletion, global warming, and other vital environmental conditions, it impacts significantly human health, safety and welfare as well as conditions of social premises.

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[12] http://www.arc.cmu.edu/cmu/programs/ugrad_progs/five_one.jsp Carnegie Mellon University, School of Architecture, Sustainable Design Graduate Program (M.Sc.)

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THE LIFE CYCLE ASSESSMENT OF TEMPORARY HOUSING

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Abstract

The awareness about the gap between temporary housing reconstruction and planning is increasing. This study examines the relation between planning and organisational structure of the temporary housing reconstruction in Turkey, a developing country which is affected by the 12 September 1999 earthquake. Temporary housing is analyzed based on the planning, organization and design of the earthquake houses and housing sites. Production, occupancy, evacuation, dismantling, recycle and re-use phases of the temporary houses and housing sites are evaluated in the experience of Duzce Case Study. A public questionnaire is conducted from the temporary housing dwellers in order to analyse their expectation levels from the temporary houses and housing sites. The user's problems tried to be found out as well. The results of the evaluation of the temporary housing reconstruction give design suggestions for the decision makers, city planners and architects for the future disasters. The results show that design had a crucial role in temporary housing reconstruction and had to be placed in the context of planning and organization models of each country and must be based onto the local, cultural, social and physical conditions of the affected region.

Introduction

Disasters are events which occur within some specified periods of time and spaces, and threat a society or a relatively self-sufficient part of a society with major unwanted consequences. They are mostly unavoidable events coming in unexpected times. However, settings of pre and post disaster activities have important roles in reducing the future hazard risks in disaster prone areas (Tercan 2001). The number, type and losses from disasters are increasing worldwide. Not only is the number of natural and manmade disasters increasing but the cost in property human life. For natural disasters worldwide, the annual economic losses averaged $4,9 billion in the 1960's, $15,1 billion in the 1980's and $75,9 billion annualy in the 1990's (Siembieda et al 2002). However, disasters cause also technological, societal and environmental problems.

Every disaster that leaves many people homeless triggers renewed and often intense debates about what technologies are appropriate to rebuild homes so that they are 'safe' or 'disaster-resistant'. Shelter relief and reconstruction programmes absorb large amounts of international aid, yet we know very little about these programmes long term results. Do reconstruction programmes suceed? What factors lie behind success and failure? What should be done to make reconstruction more effective? (Twigg 2002). To articulate all these different factors, a careful organisational structure, long term planning and sustainable design is required.

Life Cycle Assessment is enabling a cradle-to-grave approach of understanding the material flows into the built environment and the savings that can be instituted. Indeed a more detailed and comprehensive approach is necessary, starting from the design and construction stages to the use and demolition stages: a conception-to-resurrection approach that takes all stages, and effects and impacts into consideration including what happens when a building has to be demolished – that stages too has environmental effect (UNEP, 2003). This type of assessment could be used as a design and management

tool for the decision makers, city planners, architects and disaster managers to boost the reconstruction facilities after the disasters.

The aim of the research is to evaluate the Life Cycle Assessment of temporary housing reconstruction from the site selection, production, occupancy, evacuation, dismantling to reuse and recycle processes in a case study in Turkey-Düzce by considering the dwellers' expectations. Study is conducted in four big temporary housing site constructed in Turkey-Duzce after 12 November 1999 earthquake. Pre-information about sites is received from the temporary housing site administrators who were assigned by the central government. Interviews are made and a questionnaire is conducted from the dwellers in order to determine their problems and expectation levels from the houses and sites. The other studies and researches about the temporary housing in Turkey were generally focused on the production and occupancy phases. This study aims to cover all phases of the temporary housing so that to evaluate the problems in a wide point of view which could gather all the stakeholders.

Post Disaster Temporary Shelter and Housing Reconstruction

Shelter problem after the disasters are generally followed by three overlapping phases;

1. Spontaneous Shelter (first 72 hours) - to provide an interim, safe haven while the situation stabilizes
2. Emergency Shelter (first 60 days) - to provide emergency shelter and feeding to displaced population requiring shelter.
3. Temporary (Interim) Housing (first year and beyond) - to provide temporary housing - safe and secure shelter, water, power, and heating - to displaced disaster victims while efforts are underway to make permanent repairs to dwellings, or to find other suitable permanent housing (HRWG, 1998).

The distinction between housing and sheltering is made on the basis that housing involves the resumption of household responsibilities and activities in the new living quarters, whereas during sheltering, normal daily activities are put on hold (Johnson 2002).

12 September Duzce Earthquake

The 1999 earthquakes occurred in Düzce and Marmara region implies major impacts on the Turkish government budget, from cost of interim subsidies, debt rescheduling and subsidized credit programmes, and from the direct budgetary costs arising from re-housing needs, family support and social infrastructure damage, namely;

- New investment spend for the construction interim prefabricated homes and the progressive reconstruction and repair of permanent housing and infrastructure;
- Extra consumption/transfer spending for the relief and extra social security spending due to extraordinary death and disability benefits (Price et al. 2000).

Düzce province is located on the North Anatolian fault line in Düzce plain (Figure 1). As a result of the rapid industrialization between1980-1998, the migration to the city from the rural areas increased and the housing demand rapidly increased too. The total area of the city is 2593 km2. The population is 307.056 according to 1997 census, the density of 108 people/ km2 which is more than Turkey's 83 people per km2 average. Rapid migration caused unplanned constructions in the city. Nevertheless, users add more floors to the old buildings which were constructed on weak soil. New buildings were constructed rapidly with inconvenient labor and material. On the other hand, there were no reliable control systems for the building construction processes (Düzce Municipality Chairmanship 2000).

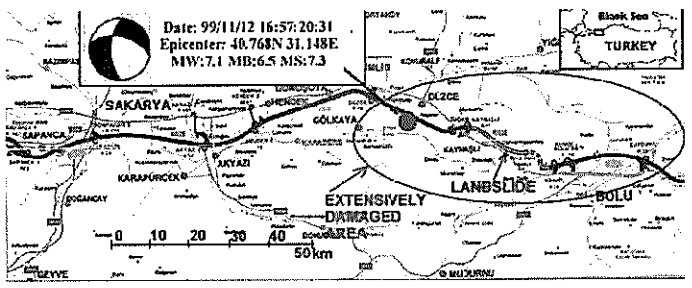


Figure 1. North Anatolian Fault Line and Location of Duzce Province (DMC, 2000).

Post Disaster Temporary Shelter and Housing Processes in Düzce

In 12 November 1999 the devastating earthquake with 7, 2 magnitudes occurred in Düzce province. Approximately 43000 buildings were damaged. Generally 84 % of the damages occurred to the houses and % 16 of them to the work places. Also 980 people died and 38939 were injured (Düzce Governorship 2002). After the 12 September 1999 Duzce Earthquake, 16.666 housing units destroyed or damaged by the earthquake and people were forced to find emergency shelter (Duzce Governorship 2002). They had three options;

i) shelter with friends or relatives;
ii) move to an undamaged second home or rent accomodation, and
iii) tent shelter in organised camps (more likely for people whose homes were demolished), or in the neighborhood of the damaged but usually still standing house.

The latter option also involve the use of vacant public buildings and 996 family with 4369 people selected this option (Price et al. 2000). 26665 tents which were donated from national and international aid organizations were distributed to 112000 earthquake victims by the help of Red Crescent and Civil Defending Directors, and tent cities were established. However, some victims built the tents on their own. The first precaution that governorship took was to settle some victims to the state buildings in other provinces. Most of the victims refused to leave the city since, they wanted to be in contact with their relatives and friends, they also wanted to be in charge of funerals and they desired to stay in the areas of damaged and collapsed buildings. In the following phase, the decision for building a temporary earthquake house was taken by the public works ministry because of insufficient infrastructure of tent cities, the lack of protection from the climatic conditions and long construction time of permanent houses (Düzce Municipality Chairmanship 2000).

Temporary Housing Settlements in Duzce

6669 Temporary houses were constructed in Duzce province. 3.411 were donated by various national and international aid organizations. There are 11 temporary housing sites in Düzce city center with 10637 population. The studied sites are selected due to their population and location (Figure 2).

Number	Temporary Housing Area	Housing Units	Population
1	Gumuspınar	1194	4428
2	Sıralık	1024	1850
3	Kirazlı	405	670
4	Kiremit Ocağı	330	1415
5	Cumhuriyet	152	300
6	Fidanlık	352	720
7	Turk-Japon Koyu	714	2902
8	Fevzi Cakmak	252	875
9	Hamidiye	56	123
10	K.Ahmetler	360	230
11	Cay Mahallesi	105	26
TOTAL		4944	10637

Figure 2. Temporary Earthquake Housing Areas, Housing Units and Populations (Düzce Center)

The temporary houses and sites were constructed generally on the state land and on rural areas outskirts of the city (see Figure 3) according to the act of 17. 7. 1968 date and 1051 number "General Disaster Law";

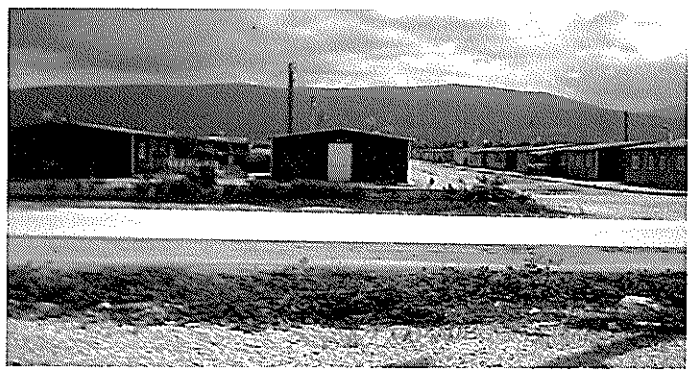


Figure 3. View of Gumuspınar Temporary Housing Site.

Topic 6-d) Houses and huts can be constructed, rented or purchased according to the sheltering needs of victims or people in the risk of disaster. The aid in cash for the victims and temporary sheltering works subsidies determined by the Ministry of Public Works and Settlements (T.C. Resmi Gazete 1968).

In this topic there is no information about how will be the role distribution between the actors? (NGO's, Local Government, Professional Associations, etc.) How and from whom would the works be done? And how long would the work take to

be finished? What methods will be used during construction? What will be the strategies and planning criterias for post disaster sheltering? How will they be organized?

All the authority were left to the central government (see Figure 4) for the issues which require technical data and build up such as; the construction, management, evacuation, dismantling of temporary housing sites and their infrastructures (Düzce Governorship 2002).

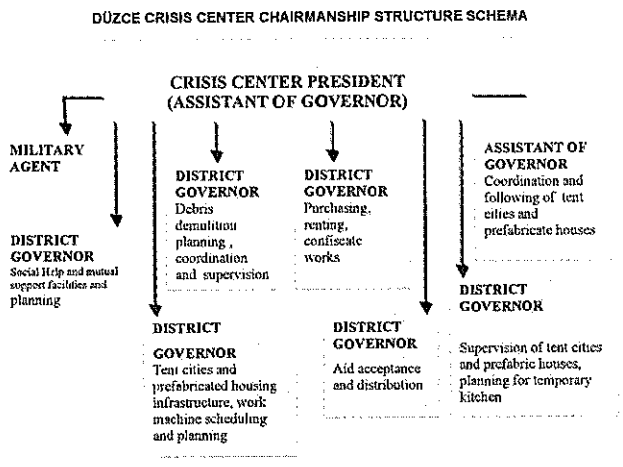


Figure 4. Düzce Crisis Management Center (Duzce Governorship 2002).

In this approach central government is not perfect about the technical aspects. So that, sometimes can not give reliable decisions or waste time in the process of getting information about the issue. Therefore the rehabilitation time extended. Technical and implemetation side is weak in this administration scheme whereas there should be plans e.g. demolition and debris plans for the heavily damaged buildings, temporary housing site selection and production process analysis, and decisions for each practice. The admistratives also had lack of information from technical aspects which they could not confront with technical support in a short time.

Temporary Housing Housing Sites Selection Process

Pre study before selection of the sites was made by The General Directorate of Disaster Affairs (GDDA) according to;

• Geologic and Geophysic Reports.
• Ground research for the determination of ground water level and the situation of flood risk.

The number of prefabricated housing sites were determined according to the researchs of TSI (Turkish Statistical Institute). Priority was given to the government owned vacant land during the selection process of temporary housing sites. The infrastructure facilities were constructed by the General Directorate of Construction Affairs (GDCA). In Duzce case 90 % of the constructed temporary housing sites were on government owned vacant land. But most of the public lands were also agricultural lands thus the lands recycle problems occurred after the evacuation. But they cost too much to recycle. The other 10 % was private ownership and were generally rented or occupied by the central government. But ownerships were not pleased from the situation. They opened a court case against the government because of the impacts of temporary houses and their infrastructure to the land, which have not been finalized yet (Duzce Governorship 2002).

The Temporary Housing Production Process

After the selection of sites, the bid with contractors for the construction of temporary houses was made by the Ministry of Public Works and Settlement and 325B temporary houses were constructed. Some of the temporary houses were donated by the NGO's whereas some of them produced in the prefabricated house production facility center close to Ankara.

The administration of the temporary housing project was highly centralized. Major decisions regarding procurement and construction were made in offices in Ankara by the MWPS and the GDDA. Construction of the units was undertaken by private construction companies and managed by the provincial authorities of the MPWS.

The state companies were responsible for road works and electricity managed the infrastructure (Johnson et al. 2006). The process did not cover the community participation. Thus the lack of participation caused low maintenance to the buildings and many damages occured during and after the evacuation process (Arslan and Unlu 2006).

The general problems during the production phase were determined and they can be summarised as;

• Organizational problems during the coordination of the construction of superstructure and infrastructure (no criteria for the selection of contractors).

• Insufficient number of the control personell (decreases the quality of production) (Arslan 2004).

Temporary Housing Occupancy Process

The administration of the temporary housing sites during evacuation was managed by the assistant of governor (Figure 4). The legal arrangements and the control was made by the assistant of the governor as well. The coordination between the temporary housing sites was made by the temporary housing coordinator who was responsible to the assistant of governor. Each temporary housing site also had a manager. The social places in the sites were changed from site to site but most of them generally had cafe, laundry, sewing house, tailoring house, etc. The local government provides the water, cleaning and garbage activities. There were also fire teams against fire risks formed by the disaster victims (Arslan 2004).

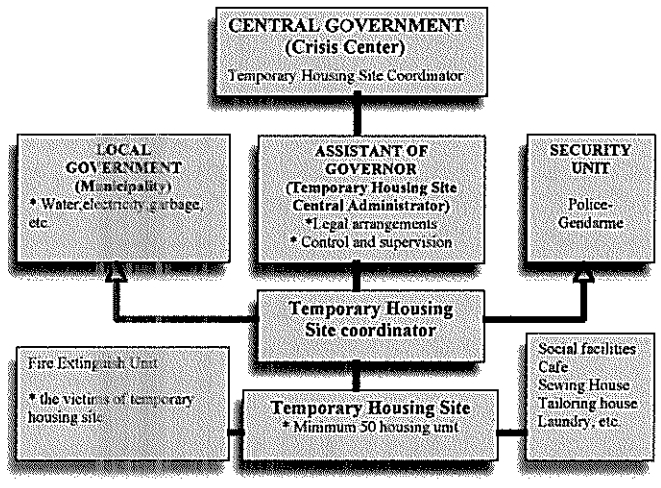


Figure 5. Temporary Housing Occupancy Process Organization in Duzce Adapted from (Arslan 2004).

The general problems during the production phase were determined and they can be summarised as;

• The lack of sound and heat insulation (social problems occured in the neighborhood).

• The lack of roofing materials against snow and wind (damages occured on 6 housing unit in Gumuspınar Temporary Housing Site).

• The lack of infrastructure (Most of the sites had cesspools).

• The house plan types did not give permission privacy for the family (Arslan 2004).

Temporary Housing Evacuation Process

Studies in Düzce showed that there was a gradual evacuation plan for temporary housing areas which was planned by the central government. After the finishing of permanent house the house owners were moved to their permanent houses at the outskirt of the city. But tenants go on living in the temporary sites.

Cental government tried to collect all tenants and temporary site users in two big temporary housing site (Gümüşpınar-Sıralık). However the real situation was not as planned. Temporary houses were occupied by new settlers from different low income social groups. Because they pay too little as renters of the temporary houses.

The existing dwellers denied evacuating the houses and sites. As a result the central government forced them to leave by turning of electricity and water of the sites for evacuation and demobilization (Arslan and Unlu 2006). During the evacuation users made great damages to the temporary houses.

Temporary Housing Dismantling Process

The dismantling processes of temporary houses did not have a planned organization and the decision for dismantling determined due to the situations and quickly by the central government. In Düzce case two options were observed;

Dismantling by the public sector: the provincial authorities of the MPWS dismantled the houses through the agency of subcontractors. The provincial authorities' role was limited with control. The dismantled materials were stored. The materials were used according to the available purposes (e.g. donation to the other disaster affected areas) approved by the central government.

Dismantling by the private sector: The housing units were sold to the private firms or person. The private firms dismantled the housing units according to the method selected by the subcontractor (Arslan 2004).

The general problems during the dismantling phase were determined and they can be summarised as;
- Unplanned interventions and implimentations by the local authority of MPWS (no short or long term planning)
- Lack of legal infrastucture for deconstruction and dismantling
- Unqualified and unexperienced subcontractors
- The complicated details of the housing units (Arslan 2004).

Temporary Housing Recycle and Re-use Process

In Düzce case study three options of recycle and reuse potential were determined for the temporary houses;

1. Donation: the housing units were donated to the disaster affected areas, self governing office for mukhat's and to the low income families in the villages of Düzce.

2. Selling: the central government sold the housing units for cash money.

3. Old/New Function: the housing sites and houses were used with their old function (eg.temporary house) or with a new function (eg. permanent house, worker dining hall and dorm, construction site office, etc.) (Arslan 2007).

The general problems during the recycle and re-use phase were determined and they can be summarised as;
- No planning and organization structure were not determined.
- Decision for short and long term were not determined.
- The lack of storing lands and/or buildings for the houses materials (Arslan 2004).

Case Study of Düzce Temporary Housing Sites

Research areas were determined as; Fevzi Cakmak, Gumuspınar, Sıralık and Fidanlık temporary earthquake housing site which were located in the centre of Düzce (Figure 5). The sites had large capacity of population and were not evacuated at the research time (Figure 6). A public survey applied to totally 200 disaster victims. 50 earthquake victims for each site were selected randomly for face to face questionnaire. By survey questions; the socio-economic structure of the dwellers, their satisfaction levels from the sites and the houses, their opinion about occupancy of temporary houses and their long term expectations from the sites and the houses were tried to be determined.



Figure 6 Location of the studied temporary housing sites (Düzce Governorship GIS, 2002).

Most of the dwellers of temporary earthquake housing sites participated into the survey did not have good economic conditions. They had no other alternative living site. Therefore, they continued to live in these temporary sites. Dwellers thought that temporary housing beginning and ending of construction processes were late. The majority of the dwellers stated that social areas and roads in the site were insufficient. The intensive expectations were about children playing area. The survey participators explained their opinions as "good", "average" and "bad" about the houses and the common used areas (Cosgun and Arslan 2003).

According to the evaluation of dwellers data about temporary earthquake houses; dwellers stated the condition of the houses average, general environment order bad, streets bad, cleanliness of the site average, street wideness average and distance between houses bad. According to evaluation of dwellers data about infrastructure and services; generally

street lighting average, sewer system good, electrical services good, water pressure adequacy average, quality of drinking water average, public services average, neighbourhood committee for providing local organisations average. According to evaluation of dwellers data about transportation and shopping; user stated the transportation chance average and shopping adequacy bad (Arslan 2004).

Temporary houses are insufficient as place for dwellers. Therefore half of the dwellers made adding to the houses. But they were all random and spontaneous adding. In case of making appropriate adding big majority think to use the houses until the end of their life cycle. The dwellers expected to make appropriate adding by the assistance of state or/and related organisations (NGO's) or want to receive long term low interest loans for the finance. Especially in Gumuspınar and Sıralık temporary housing sites the high tendency for using the housing sites until the end of their life cycle site were determined (Arslan 2004).

Results

Generally in Turkey the central government organized and responsible for the whole activities pre, during and after the disaster. The military service had an independent role whereas the local government had no authority. The local and international NGO's was not considered and the community participation is very limited. So that the community participation can be formulated in the context of pre-disaster participatory design solutions.

The community participation could be encouraged and the community. They could select representatives who would had a a role in the design phase. This representatives could be encouraged to boost and use their communities physical or mental abilities especially in design phase to increase their satisfaction level. Because the reconstruction is either a physical reconstruction process eg. construction of the superstructure and infrastructure, or is a new social reconstruction of the community. So the processes might cover all the stakeholders in all disaster periods especially the reconstruction phase. The cooperation with local government would minimize the physical and social effects of integration to the city. The design also could cover the psycho social data of the disaster effected region and should also be strengthened by the planning and organization structure of thecountries.

According to Life Cycle Assesment of the case study, the following suggestions might be determined for each phase;

PHASES	LIFE CYCLE ASSESMENT RESULTS OF DUZCE CASE STUDY
PRODUCTION PHASE	The use of local constructors could boost the reconstruction of the disaster affected area by remaining the sources in the area and accelerating other reconstruction facilities in indirect ways. This will also blocks the probable problems occured by the foreign constructors, and increases the motivation of the community.
DISMANTLING PHASE	The use and selection of demountable building materials which had minimum and easy conjuctions with short assembling, transportation and rejoin time.
EVACUATION PHASE	In the evacuation process decision makers must be careful and consider these questions: Who are the existing dwellers? Where will they relocate? What are the future immigration risks of the site? When and How will the site be dismantled?
RECYCLE & RE-USE PHASE	Recycle; the use of local materials would decrease the transportation costs and save time and money for other reconstruction facilities. The use of recycled materials would decrease the environmetal impacts and energy use which need a governmental recycle infrastructure (eg. Recycled concrete systems). The design for the infrastructure and foundation systems must have the minimum damage to the ground (e.g. stake foundations would enable the recycle and reuse of the land).

RECYCLE & RE-USE PHASE

The infrastucture had to be easily removed (especially agricultural lands) after the evacuation of the site with minimum energy use and cost, its integration with the local city or regions infrastructure must be considered. Because the infrastructure materials had also environmental effects whether they are not used and they also did not vanish in short time periods.

Re-use; the selection of modular building typologies enables new functions (e.g. school, hospitals, etc.) which is a way of reusing the materials and sources.

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DESIGN DISASTERS IN THE HISTORY OF COMPUTING

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Abstract

The timelines of computing history are stories of successful products or important technological developments, which are stated to have changed the course of computing history. These timelines present prima facie evidence of technological developments in isolation, suggesting a smooth, unproblematic developmental progress of an industry and rarely giving any indication of the possible reasons why the items discussed were so successful. In addition these same timelines say little of the numerous products that disappeared from view, although these can tell us just as much about the consumption of technology as the successes.

Design disasters in the computing industry were legion, as numerous companies competed for sales. Why did products hailed as significant breakthroughs fail to maintain a place in the market? The archives of manufacturers brochures present us with computers from large and small manufacturers no longer in existence, and show products which in many cases were years ahead of the competition but for one reason or another failed to make a mark.

This paper explores how these developments have been analysed from the perspectives of different theories, including technological determinism, social constructionism and actor network theory. Using the tablet computer as a case study, this paper explores the connections and interactions between these differing viewpoints.

Introduction

This paper is essentially about the design, production and consumption of artefacts and the numerous factors which can affect their success or failure. For any company bringing a product to market the amount of time and money invested in the research, design and development of the product itself and in the market research, marketing promotion, packaging and distribution and retailing of a product means that an unsuccessful take up of that product by the target audience is by any definition a disaster. Although, as will be discussed, the reasons for that failure may be placed at different points in the production-consumption process, the integral role of design in that process means that such disasters can legitimately be seen as design disasters irrespective of the quality or otherwise of the design work itself. Such occurrences are perhaps disasters for design if not disasters of design.

This situation is perhaps understandably more common where the products concerned are complex technological products in a fiercely competitive field, where the technology itself is still relatively young, not yet stable, and in a constant state of flux. Consequently, the historical development of the personal computer is (quite literally) littered with examples of products that have failed in the marketplace. Occasionally the result of poor manufacture; the subject of misdirected marketing or promotion; often the result of software not quite living up to consumer expectations, some of these products could be said to have 'deserved' to fail. However, having said that, advances in production technology and quality control in recent

years has acted to at least reduce manufacturing failures (notwithstanding some very well publicised events such as the poor battery life of earlier iPods, the cracked screens of the first iPod Nano and exploding batteries in Sony laptops (Johnson 2005, Yeoman 2006)). We are still faced, then, with a number of examples of products which have clearly been very well designed (often winning design awards), produced to a very high standard, been heavily promoted, and have performed their advertised functions, yet have still not managed to succeed as products in the marketplace. The variables at play here which cannot be controlled are social ones.

Theories of Technological Change

A great deal has been written about why technological products fail in the market place, from a number of different perspectives including economic and business analyses, marketing critiques and design critiques, and sociological enquiries. The body of work would be far too large to describe in any depth here, but a small selection provide some useful starting points for discussion.

'The Invisible Computer' by Donald A. Norman is a fairly pragmatic text which attempts to describe the situation without over-theorising. Norman refers to the notion of 'disruptive technologies' - technologies which have the ability to change people's lives and the entire course of the industry (Norman 1998:232). This ability to disrupt inherently produces products to which there is initially a large amount of resistance. Bringing together a number of previous pieces of research, Norman concludes that part of the problem is that companies do not take new technologies seriously due to a number of factors:

- New technologies are usually initially inferior to existing ones.
- Large companies require large business markets.
- Investing in improving existing products will bring a greater return in the short term than developing new products.
- The need to show profits on a yearly basis deters long-term investment.
- New products often require collaboration between competing departments of a company.
- New products get compared unfavourably with existing successful products.

(Norman 1998:235-237)

Norman's argument is that in order to be accepted in the marketplace, three aspects have to be completely right – the technology, the marketing and the user experience. As an example, he quotes the well-known story of the Xerox Star computer designed at Xerox PARC in the early 1980s.

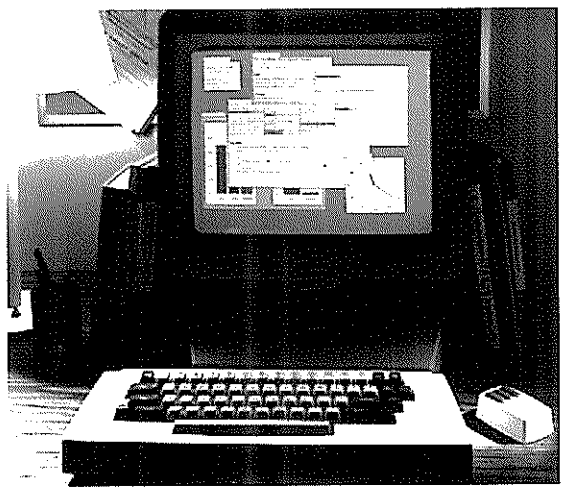


Figure 1. Xerox Star, 1981.
(Courtesy of Palo Alto Research Center, Inc.)

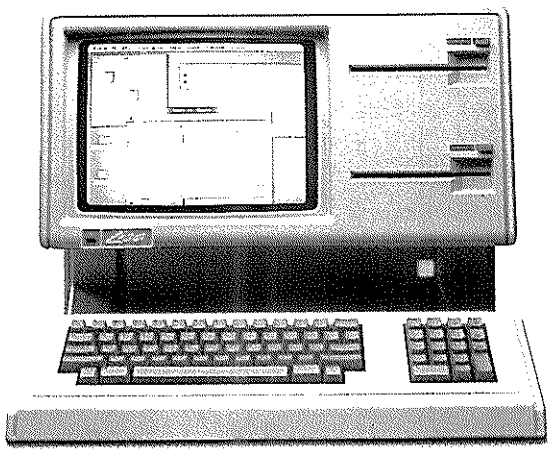


Figure 2. Apple Lisa, 1983.
(Courtesy of Apple Inc.)

The Star was a product well ahead of its time, having the first commercially available graphical user interface, and a design philosophy of user interaction which set the standard for an entire generation of PCs (Fig. 1). Unfortunately, the product was a consumer product before the consumer existed. The product had not gone through the process of exposure to the marketplace which occurs when a new technology appears, is accepted by 'early adopters' of technology, and then refined for the mass market. The same happened a few years later when Apple introduced the Lisa – a larger, more expensive precursor to the Macintosh (Fig. 2). In both cases, the technology wasn't quite ready – they were both painfully slow, had limited functionality as no one had written applications for them, and were extremely expensive. Therefore, there was no benefit for 'early adopters' of technology in using these products, as despite the novelty of the graphical user interface, the lack of applications meant it didn't do anything other computers could do. The fate of the Star and the Lisa would have happened to the Macintosh itself, had it not been saved by the advent of a 'killer application', making it indispensable to a groups of users. In the case of the Macintosh, this was through the invention of the laser printer and desktop publishing software.

Norman's point is that the Star and the Lisa both had superb user experiences, but insufficient technology and marketing. (Norman 1998:41-43) Not having all three was the reason for failure.

This is an acknowledgement that the reasons for failure in the marketplace of any product are more complex than at first might be imagined. At the very least there is usually more than a single reason for design disasters. This notion is explored in other theories which address the same issue, to a greater or lesser extent.

The theory of the social construction of technology takes the view that a complex range of factors are involved in the success of products, and that social factors have precedence in the process. As a counterpoint to a physical reality affecting outcomes (i.e. the technology itself), social constructionists see a web of relationships between people, between institutions, that share beliefs and meanings as a collective product of a society, and that these relationships are the basis of subjective interpretations rather than physical or objective facts. The notion of the 'truth' of a socially constructed interpretation or piece of knowledge is irrelevant – it remains merely an interpretation (Pool 1997). It is an interpretation, though, which has significant agency.

This is in direct contrast to the view of technological determinism – the view that technology and technological change are independent factors, impacting on society from the outside of that society -that technology changes as a matter of course, following its own path, and in doing so, changes the society on which it impacts. (A good example is the notion of 'Moore's Law', which states that the power of a microchip doubles every year as if it was a 'natural' phenomenon). There is an element of truth contained within this, that technological products do of course affect and can change our lives, but it is simplistic to imagine other factors are not at play. Put more simply as 'interpretive flexibility', the argument of social constructionism is that different groups of people (i.e. different relevant social groups of users) can have differing views and understandings of a technology and its characteristics, and so will have different views on whether or not a particular technology 'works' for them. So, it is not enough for a manufacturer to speak of a product that 'works'; it may or may not work, depending on the perspective of the user (MacKenzie and Wajcman 1999).

The above arguments on social constructionism have most famously been promoted by the sociologists Trevor Pinch and Wiebe Bijker (1987), where they use examples such as the developmental history of the bicycle to show how a linear, technological history fails to show the reasons for the success or failure of different models, and that a more complex, relational social model is required.

An alternative view is held by some others, such as the historian of technology Thomas Hughes, where technological, social, economic and political factors are seen as parts of an interconnected 'system'. In this instance, different but interconnected elements of products, the institutions by or in which they are created, and the environments in which they operate or are consumed are seen as a complete, interdependent network. However, a technological system remains a socially constructed one: 'Because they are invented and developed by system builders and their associates, the

components of technological systems are socially constructed artifacts' (Hughes 1987:52). There is still a distinction here, though, between human and non-human components of a system: 'Inventors, industrial scientists, engineers, managers, financiers and workers are components of but not artefacts in the system' (Hughes 1987:54).

Taking this 'system' based approach a stage further leads us to Actor Network Theory, associated with the sociologists 8runo Latour, John Law and Michael Callon. Actor Network Theory (or ANT, as it has come to be referred to) breaks down 'the distinction between human actors and natural phenomena. 8oth are treated as elements in 'actor networks' (8ijker et al. 1987:4).

In ANT, all parts of a system or network are equally empowered as actors having an influence on technology – there is no distinction between small or large elements, animate or inanimate, real or virtual. Technology is conceived of as a growing system or network. The actors (and the relationships between the actors) 'shape and support the technical object'. (8ijker et al. 1987:12)

An important aspect of the theory is that:

> The actor network is reducible neither to an actor or a network alone nor to a network. Like networks it is composed of a series of heterogeneous elements, animate and inanimate, that have been linked to one another for a certain period of time. The actor network can thus be distinguished from the traditional actors of sociology, a category generally excluding any nonhuman component and whose internal structure should not, on the other hand, be confused with a network linking in some predictable fashion elements that are perfectly well defined and stable, for the entities it is composed of, whether natural or social, could at any moment redefine their identity and mutual relationships in some new way and bring new elements into the network. An actor network is simultaneously an actor whose activity is networking heterogeneous elements and a network that is able to redefine and transform what it is made of.
>
> (Callon 1987:93)

In other words, the role of any particular actor in a network is not fixed, but indeterminate and changeable, being at times dominant, or at other times, insignificant in its agency.

I have previously used the theories of Pinch and 8ijker to examine the historical development of the laptop computer, and presented a case that despite a number of attempts to introduce a portable computer for the executive market in a variety of different forms, the proposed 'solutions' continually failed to be accepted by the relevant social group of users.



Figure 3. Texas Instruments 'Silent 700, 1972.
(Courtesy of Texas Instruments Incorporated)



Figure 4. Osborne 1 Transportable Computer, 1981.
(Courtesy of Computer History Museum)



Figure 5. Husky Rugged Handheld computer, 1981.
(Courtesy of Intronix Corporation)

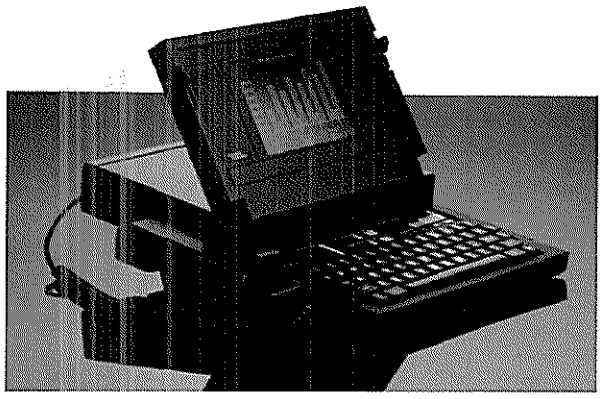


Figure 6. The GRiD Compass Laptop Computer, 1981.
(Courtesy of IDEO)

Some of these attempts failed because the product had limited functionality, others because of limited portability (Figs 3-5). It was not until available technology reached a point where all these issues could be resolved, and the product was presented in a physical form that also addressed the users' expectations that the laptop computer became widely accepted as a product form (Fig. 6) (Atkinson 2005).

In this paper, I wish to pursue a case study of a range of products, which have been put forward by different manufacturers for a number of years, yet which (despite the predictions of people such as Bill Gates) have failed to make an impact in the marketplace – namely, the tablet computer. Tablet computers, or tablet PCs, are essentially notebook or slate-shaped computers which utilise touch-screen technology to enable operation by a stylus or fingertip rather than a mouse or keyboard (a process known as Pen Computing).

Tablet computers have taken a number of different forms over previous years, but can be grouped into four general categories:

- **Slates** – these are computers with no keyboards, although keyboards can be attached. They have been more successful in specialised fields such as health care, education and for field work. 'Rugged' tablet PCs are usually 'slates'.
- **Thin** – client Slates – these are basically wireless versions of 'slates' which have no onboard processor or storage and link remotely to a server. Used where portability is the key concern.
- **Convertibles** – these are laptop/notebook computers with screens that rotate, swivel or slide to form a writing surface, converting the laptop to a tablet PC. They are the most commercially successful form of tablet, as they provide the benefits of both laptops and tablet computers.
- **Hybrids** – these are convertible tablets where the keyboard can be completely detached. These have not been commercially successful at all. (Wikipedia 2007a)

The History of Tablet Computers and Pen Computing

Historically, the conceptual roots of the tablet computer are the same as those for the laptop computer, both arising from the original 'Dynabook' concept proposed by Alan Kay and the Xerox Palo Alto Research Center (PARC) in the late 1960s (Fig. 7).

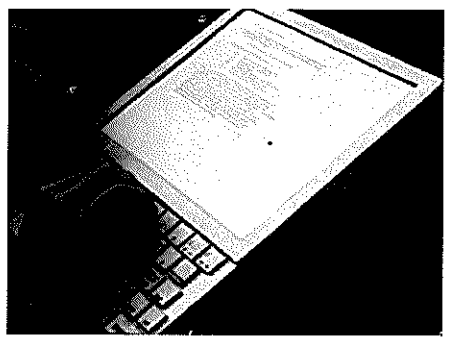


Figure 7. Alan Kay's 'Dynabook' concept, circa late 1960s.

The Dynabook concept was for a book or "slate type computer with nearly eternal battery life and software aimed mostly at giving children unlimited expression opportunities with all digital media imaginable. Adults could also use a Dynabook from the start, but the target audience would be children, and the software would grow up with them" (Wikipedia 2007b).

Quite clearly, such a computer was not technically possible at the time (and Kay still thinks we haven't got there yet[1]), and yet this vision drove the development of computing technology inexorably towards truly portable computing. Interestingly, a company called Dynabook Technologies was set up in 1987 to develop such a computer and it had $37 million in financial backing, yet never managed to overcome technical problems and went bankrupt in 1990 (Kaplan 1999:197).

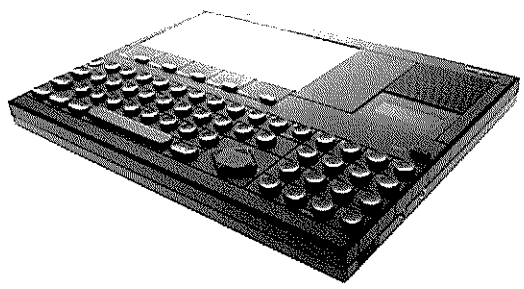


Figure 8. Convergent Technologies Workslate, 1983.
(Courtesy of IDEO)

An early attempt to produce a 'tablet' type computer which was clearly inspired by the 'Dynabook' concept came as early as 1983, when the 'Workslate' was introduced by Convergent Technologies (Fig.8). This, however, had a small display, had limited capabilities, and used a keyboard input rather than a stylus. As such it was not strictly speaking a 'tablet PC'. The product had few applications, and despite its obvious design qualities, failed in the marketplace.

[1] For an interesting interview with Alan Kay and the thought processes behind the Dynabook concept, see: http://www.squeakland.org/school/HTML/essays/dynabook_revisited.htm (accessed 18 January 2007).

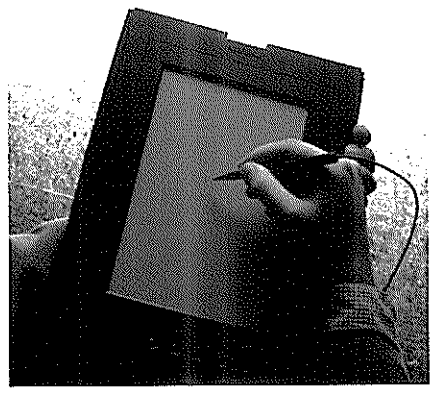


Figure 9. The GRiDpad, 1989.
(Courtesy of Jeff Hawkins)

The first successful attempt at a commercial tablet PC appeared in the form of the GRiDpad from GRiD Systems, conceived by Jeff Hawkins (Fig. 9). GRiD Systems was the company that produced the first true laptop computer, the GRiD Compass, launched in 1982. Hawkins came up with the idea of a tablet computer with a stylus interface while studying neuroscience at UC Berkeley during a two year leave of absence from GRiD. He returned to GRiD in 1988 to develop the first tablet computer for them, and managed the GRiDpad project (Moggridge 2006:184-185). The GRiDpad was targeted at specialist, vertical, markets such as the medical profession, as this is where Hawkins saw market opportunities. In its best year the product turned over in excess of $30 million (Hawkins 2007).

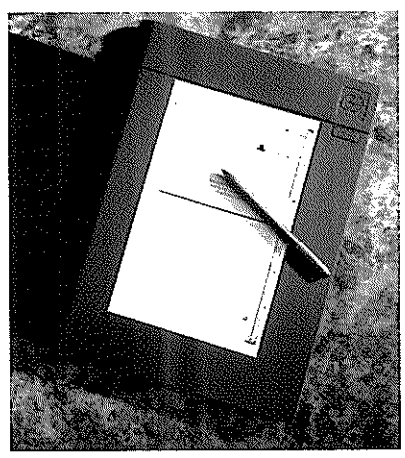


Figure 10. The GO computer, 1992.

The GO computer took a long time to get to market. It was already being planned when Jeff Hawkins went to visit GO in 1988, yet despite having over $35 million in financial backing and the enthusiastic support of IBM and AT&T, it suffered all kinds of engineering setbacks, and was not launched until 1992 (Fig. 10). Rather than use a proprietary operating system, GO insisted on developing their own, putting them in direct competition with Microsoft. When Microsoft launched Windows for Pen Computing a huge PR battle ensued (Hawkins 2007). Not surprisingly, GO lost. GO was founded by Jerry Kaplan and Mitch Kapor, and Kaplan went on to write an autobiography in which he said "The real question is not why the project died, but why it survived as long as it did" (Kaplan J. cited in Kaplan 1999:199). GO was taken over by AT&T in 1994 and eventually shut down.

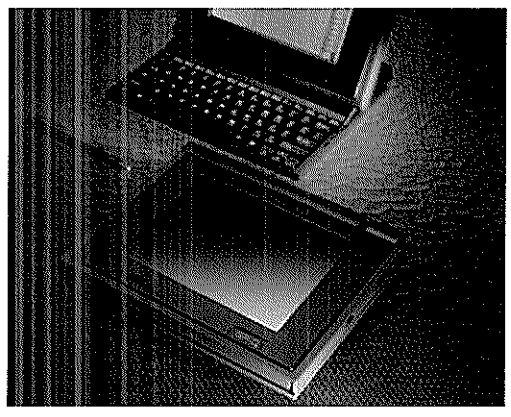


Figure 11. The GRiD Convertible, 1993. (Courtesy of IDEO)

After the GRiDpad, Jeff Hawkins tried to develop a product 'that offered the best of both the laptop and tablet' (Moggridge 2006:189). The result, with industrial design work by IDEO, was the GRiD Convertible launched in 1993 (Fig. 11). This used a clever mechanism which allowed the screen to slide and pivot to cover the keyboard and convert the laptop into a tablet. 'Bill Gates loved it. It failed in the market place. I learned at that time that people didn't really want to write on their display' (Hawkins 2007).

Apple ran a whole series of projects during the late 1980s and early 1990s to develop tablet computers, most of which were cancelled (Kunkle 1997:passim). These included a notebook-sized, slate-type computer concept codenamed 'Figaro' between 1987 and 1991 (which evolved into the Newton), the PenMac, the Macintosh Folio, and SketchPad, all in 1992, and the WorkCase and Newton MessageSlate in 1993. It was felt by Apple that a tablet computer might compete with and detract from sales of the Macintosh, so the project was rethought as a Personal Digital Assistant (PDA).

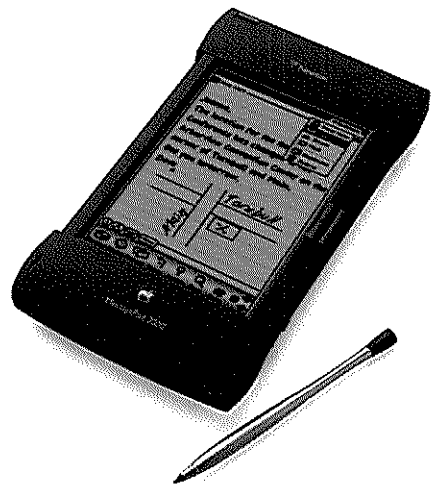


Figure 12. The Apple Newton MessagePad 2000, launched in 1997 (Courtesy Apple Inc.).

The Apple Newton MessagePad was eventually unveiled in May 1992 at the Consumer Electronics Show with a large-scale publicity drive claiming to have produced the future of computing. It was released the following year, unfortunately to weak reviews. After a number of redesigns culminating in the MessagePad 2000 (Fig. 12), the technology was placed into the Apple eMate laptop computer in 1997 and then discontinued altogether in 1998. Although it was produced for six years and won numerous design awards, the Newton was never the success Apple hoped for, and the intention to reinvent personal computing was never met (Wikipedia 2007c). Although it was marketed as a PDA rather than a tablet computer, the unit itself was too large to fit into any pocket, was expensive (the final models costing $1000) and initially suffered from poor handwriting recognition software, which many regard as being the main reason for its failure (Moggridge 2006:198).

The End of the Line?

The Apple Newton would seem to mark the transition from tablet computer to the Personal Digital Assistant. Other manufacturers did start producing tablet computers during the 1990s, with similarly low amounts of success - IBM produced tablet versions of the 'ThinkPad' in 1993, and Sony produced a Pen Tablet PC in 2001, but discontinued it due to low sales only a year later (Kanellos 2007). Despite this, a number of manufacturers including IBM and HP continue to produce a variety of models (Microsoft 2007) and Bill Gates openly defends them, predicting they will shortly come into their own as products and ensuring that the latest version of Windows, 'Vista', supports pen computing.

The story so far of the tablet computer covers some 40 years from its conception, with real products being produced for 18 years. As a product group, they have swallowed billions of dollars in investment capital and thousand upon thousands of man hours in R&D, design and promotion. Sales remain pitifully low, and yet manufacturers and a small number of users still cling to the concept, convinced of its potential. Coming from Microsoft, the tablet PC is most prominently promoted by one man – Bert Keely, who has the job title 'Architect, Mobile PCs & Tablet Technology'. Keely constantly attends research seminars and computer shows and appears in the media demonstrating the advantages of pen computing. He admits that tablet technology has a number of flaws and a long way to go (Keely 2005), but remains convinced that the future of pen computing will be 'astounding' (Moggridge 2006:198).

Conclusions

So, why has the tablet computer not been a successful product? As proposed by all of the theories explored in the first section of this paper, there will always be more than one reason for any product failure. Yet many of the factors mentioned in the case study as to why certain individual tablet computers had failed are issues which have consequently been resolved. Clearly the technical problems which plagued early products such as slow processor power and software reliability have been overcome. The compatibility of software means that applications for such computers are far greater in number and that while still not perfect, issues of functionality such as the reliability and accuracy of handwriting recognition software have apparently been solved. The manufacturers involved are not start-up enterprises lacking in financial support or backing, and the products are now parts of large ranges of computing equipment from well-known and respected companies, and have received marketing support of a suitably high level. Yet despite the sales predictions and assurances of Bill Gates and the enthusiastic promotion of people such as Bill Keely, tablet computers still account for less than 5% of the personal computer market.

Social constructionism suggests that a complex range of social factors are the most significant elements to take into account in the success or failure of technological products, and indeed it would appear from the technical factors that have been resolved that the only possible barriers left to the acceptance of tablet computers are social ones. The notion of 'interpretive flexibility' proposes that different groups of people will have different views on the extent to which a particular technology 'works' for them. However 'natural' a form of communication writing may appear to be, perhaps as Jeff Hawkins states, people don't want to write on computer screens, and a pen on a large display is not a good user interface for a computer (Hawkins 2007). The complexity of a personal computer, which is clearly accepted if not desired in a desktop PC, may not be acceptable in such a portable format of the tablet PC. Slow start-up times, large size and weight, and the compromises inevitable in multi-functional products such as a full computer, do not cross over well to situations where the computer is held and carried around by the user and constantly turned on and off. Factors such as these, which may appear to be small problems, or even insignificant by some, are held by Actor Network Theory to have the potential to be highly significant in the successful take up of new products. The interesting aspect of ANT, though, is the understanding that the significance of these factors is not seen as fixed, but fluid. At any moment, a factor can move from being significant to insignificant, even as the result of forces outside of the network itself. With this level of uncertainty in mind, it must be recognised that the current public attitude to tablet computers and to pen computing itself could change at any moment.

Where the tablet computer has failed to capture the public imagination, the Palm Pilot PDA has succeeded – but

that's another story. The reasons for the failure of tablet computers, as for any complex technological product, are not straightforward. Each or any of the reasons above, or a combination of small details which together constitute the nature of the experience of using a tablet computer, could be equally responsible. As social construction theory would have it, the acid test of computing equipment is not the technology, but user acceptance; and as Actor Network Theory shows, however small or inconsequential an agent may appear to be in the overall scheme of things, it can still have the ability to make or break any product.

Acknowledgements

My thanks go to Bill Moggridge and Jeff Hawkins for their help in this research.

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HOW TO DESIGN FOR THE BASE OF THE PYRAMID?

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Abstract

Recent work is re-conceptualizing global poverty as an attractive growth opportunity for firms that can simultaneously alleviate the problem of poverty. The so called 'Base of the economic Pyramid (BoP), exists of 4 billion people which live on an income of less than $3 a day. Tapping into these overlooked markets will require companies and designers to reconfigure their business and product innovation models. The challenge is the creation of accessible and affordable solutions to fit the local economical and socio-cultural preferences, without expanding the current of environmental resources. This paper will discuss the experiences of DUT and international companies in this new field of product and service design. A preliminary framework for Designing for the BoP will be proposed as well as the challenges on the short term will be discussed.

1. Introduction to the concept of the Base of the Pyramid (BoP)

1.1 BoP

Most companies, professional designers and design schools used to (or still) target only end-users in developed markets. This is a group of approximately 500 million people living at the top of the economic pyramid with an average purchasing power of more than USD 10.000 per year (Rocchi 2006). This way, according to Prahalad and Hart (2002; 2005), companies and design professionals underestimate the business potential and product innovation opportunities at the base of the economic pyramid, where many unsatisfied needs make up a new market covering a vast majority of the remaining world's population.

According to the World Bank, 4 billion people live on an income of $3 or less per day and more than 1 billion people live on less than $1 a day. This part of the world population is nowadays often referred to as the "Base of the Pyramid" or abbreviated 'BoP '(Prahalad and Hammon 2002; Prahalad and Hart 2002). In addition we can recognize 'emerging markets' which are situated in between the top and de base of the economic pyramid. This is illustrated in Figure 1.

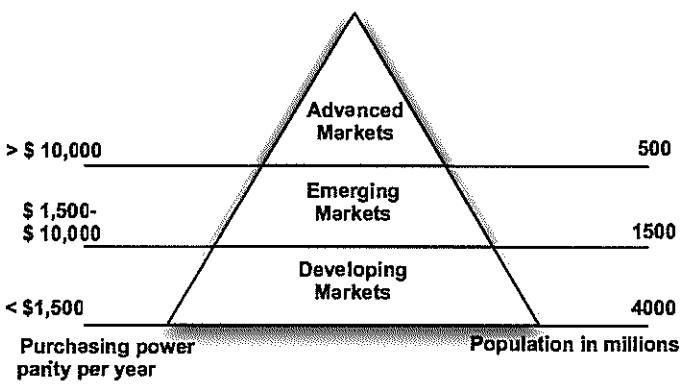


Figure 1. The three layers of the Economic Pyramid (London and Hart 2004; Rocchi 2006).

Recent work is re-conceptualizing global poverty as an attractive growth opportunity for firms that can simultaneously

alleviate the problem of poverty. The BoP represents a vast, unexploited marketplace. For companies struggling with maturing markets, floundering business models, and serious questions about who their customers of the future will be, these are important markets to explore. Their aim is to develop sustainable business that helps provide for example better health-care, living and education solutions for the world's poorest people while also providing access to this potential market of 4 billion customers worldwide and thus creating profitable business for the company (Kirchgeorg and Winn 2006).

But tapping into these overlooked markets will require companies to reconfigure their business assumptions, models, as well as their product innovation and design approaches. Multi National Corporations (MNCs) like HP, Intel, Philips, Microsoft, Shell and Cemex are already investing human and financial resources to explore this novel field of new business and product development. Delft University of Technology (DUT) and several other international universities like the Illinois Institute of Technology (IIT), Berkeley and Stanford are currently partnering with these MNCs (but also SMEs and NGO's) in order to build up a new knowledge base for "Designing for the BOP".

1.2. Rural and Urban BoP's

As discussed in § 1.1 a vast majority of the world population has been ignored for a long time in relation to product innovation and business opportunities. The few activities that took place where mainly coordinated by NGO's, (local) Governments and were focussed on the rural areas. This despite the fact that the main challenges for the coming decennia will be more evident in the Urban BoPs and relatively less in the Rural BoPs.

The global countryside has reached its maximum population and will begin to shrink after 2020. As a result, cities will account virtually for all future world population growth. Cities have absorbed nearly two-thirds of the global population explosion since 1950. The proportion of the world's urban population living in slums is projected to increase from 33% in 2003 to 45% in 2025. According to the United Nations, more than one billion people (1/6 of the world population) are currently living in the slums of cities (Davis 2006).

In many large cities unplanned growth, often informal settlements, has led to a crisis in living conditions and in social and health services. The urban poor face very different issues and livelihood choices in comparison to rural poor. The rapid growth of cities caused by migration as well as natural population increases driven by high fertility has outpaced governments' abilities to provide basic services (like water supply, sanitation, drainage, solid waste disposal), and (communication) infrastructure and economic opportunities.

Consequently the main part of our current 30 Product Development BoP projects at DUT are connected to healthcare, safe water access, ICT infrastructure and reliable renewable energy sources.

1.3 An example: Water challenges in the BoP

As observed in the previous paragraphs, the challenges to improve the quality of World's poor people are huge and diverse and depend on the context. Often these problems are connected to each other. For example a lack of access to water results in people spending many hours a day collecting water. This spending of time alternatively could be used for working (income generation) or for going to school (education). In many cases the collected water is polluted or gets contaminated during storage in the simple houses or during the handling, which results in diseases. Diseases again reduce the time that people can work or use for activities. Some facts according to the Human Development Report 2006 (UNDP 2006).

- 1.700.000.000 people in the world lack access to clean water;
- 3.300.000.000 are without proper sanitation facilities;
- 2.200.000 people die from preventable water - and sanitation related diseases each year;
- Every day 600 children die.

The challenge for firms, professional designers as well as design schools is to make a breakthrough in this vicious circle. The question is 'How can companies and designers contribute to reduce these numbers?'. As an example we would like highlight one of the BoP water projects, which DUT executed in collaboration with the firm Vestergaard Frandsen.

1.4 Case: The LifeStraw in Africa for children

The company Vestergaard Frandsen (VF) has developed the so-called 'LifeStraw', a product that purifies surface water for personal use with filters (See figure 2). The LifeStraw can clean up to 700 litters of water (the yearly consumption of an adult) and is relatively affordable (2,5€).



Figure 2. The original LifeStraw, the field-testing in Africa and the new concept LifeStraw Child.

DUT in collaboration with VF investigated several aspects of the usability and implementation of LifeStraw concept in practice in Africa, focused on children under the age of five. During the field research it was observed that children younger than three years old could not handle the initial LifeStraw by themselves. They do not understand how to suck the water. The child does not understand why it does not get water in its mouth immediately when sucking. Since small children are most vulnerable for waterborne diseases it was decided that the design of the LifeStraw should be adjusted to the capabilities of children. The final proposal consists of a adjusted LifeStraw, named LifeStraw Child, a flexible bottle and a special mouthpiece (see Figure 2, pictures on the right side). The bottle has a one-way valve that lets air in but not out. Using a smaller LifeStraw makes the product smaller and easier to handle for children (Bottema 2006). The context research and usability tests with real potential users in the African context were essential to come these findings.

2. Designing products and services for the BOP

For a company or designer to be successful in emerging and developing markets, it takes a lot more than just making minor modifications to existing products. They will have to face the need to develop new business and product innovation practices capable of establishing a mutual value creation process between themselves and local stakeholders as well as to have a deep understanding of these new contexts, and the issues and the opportunities related to the targeted areas (Simanis and Hart 2006). The challenge is the creation of accessible and affordable solutions to fit the local economical and socio-cultural preferences, without expanding the current of environmental resources (Rocchi 2006). The target here is not only the poverty of the people in the BoP, but also the environment in which they live, which tends to lack traditional utilities, such as electricity, water, and gas. Communications and transportation structures are also very weak. Most BoP communities are fragile ecologically, so new products and services need to be very eco-efficient (Sethia 2005).

2.1 Framework for designing for the BoP

In other words, how can new business opportunities and product innovation in the BoP be combined with a long-term sustainable development for all stakeholders? For that purpose we propose based upon experiences from the last 5 years a new framework for 'Designing for the BoP'. This framework is a merge of the '4 Ps' of Design for Sustainability (D4S) and the '4 As' of developing successful business for the BoP (see Figure 3). The 4 Ps of Design for Sustainability stand for People (social aspects), Planet (environmental aspects), Profit (business aspects) and Product (Crul and Diehl 2006). All 4 Ps should be taken seriously in consideration during the product development process in order to develop a sustainable product or service.

In order to develop successful products and services for the BoP, '4 As', namely Availability, Affordability, Acceptability and Awareness have proven to be essential to be successful (Anderson 2006; Prahalad 2006):

- **Availability** – Addressing challenges in distribution. Unlike in the developed world, distribution channels in BoP markets can be fragmented or non-existent.

• **Affordability** – Addressing low incomes. BoP consumers have low disposable incomes, and product may also need to match the cash flows of customers who frequently receive their income on a daily rather than weekly or monthly basis. The new products and services need to have a significant price reduction – at least 80 percent of the cost of a comparable product or service in the West.
• **Awareness** – Many BoP customers are largely inaccessible to conventional media. Building awareness and educating with the respect to the product is another challenge for all the stakeholders.
• **Acceptability** – Responding to Socio-Cultural Dimensions. The innovation must result in a product or service of high quality. They will be not satisfied with 'simplified' or 'stripped' western products.

This merge of the '4 Ps' and the '4 As' results into the following framework for Designing for the Base of the Pyramid:

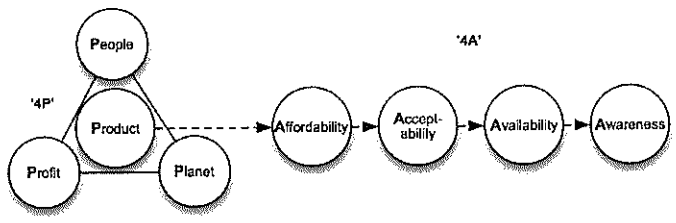


Figure 3. Framework for Designing for the Base of the Pyramid.

2.2 How do MNCs design products and services for the BoP?

In order to get more insight in how MNCs develop products for the BoP, we carried out an explorative research under 7 Western and Asian MNCs which include Philips, VIA, Haier, Motorola, Intel, Microsoft, and BenQ. The learning purpose has been achieved by case interviews with MNC managers who are influential to their emerging market strategies and product innovation processes.

It was concluded that the major challenges for the MNCs in these innovation processes include the opportunity identification, fuzzy front-end research, product introduction and delivery (Chang 2006). Most of the challenges derive from the unfamiliarity with the local context and the distinct infrastructure in emerging markets. Although MNCs have strong global resources and networks, a sustainable local enterprise network is necessary for them to interact with the local community. Non-governmental organizations (NGO) play a vital role in the innovation process of several MNCs, especially when they intend to approach consumers at the Base of Pyramid.

The local context has less impact to the actual product development process as most MNCs centralize their management on development and manufacturing resources, so the design and development can still take place either locally or in other MNC product development base.

Most important is the willingness to listen deeply to the local people and local stakeholders, and understand what they need, not what product innovators think they need. Besides the sustainability benefits such as the improvement to human health and environment, there must be added value created in the products from which the benefits can be recognized by consumers at the BoP (Chang 2006).

2.3 Challenges for designing for the BoP

There are many challenges and new interesting design tools, skills and methodologies to be developed in order to make Designing for the BoP more fully developed. However, creating products for such specific markets requires on the first place an in-depth understanding of the needs and context of the people within it as could be concluded from literature as well as our explorative study under 7 MNCs consumers (Chang 2006). In this situation it is clear that researchers and designers should engage with the cultures directly in order to better understand local people. A unique set of design and business tools and practices adapted from social anthropology, ethnography and Participatory Rural Appraisal (PRA) to build what we call an MNC's "native capability" are being developed, used and evaluated. This native capability consists of the ability to (Hart 2004):

• Engage in deep listening and mutual dialogue with income-poor communities.
• Co-discover and co-create new product design opportunities

and business models embedded in the local cultural infrastructure.

• Co-design and launch BoP products that generate mutual value for all partners.

3. How can designers get insight in and understanding of the context of the BoP?

As concluded, creating products for emerging and developing markets require a deep understanding of the needs and context of the people within it. New ways of 'contextual design' (Beyer and Holzblat 1998; Iacucci and Kuutti 2002), are becoming more and more popular also among product designers. In this situation it is clear that researchers and designers should engage with the cultures directly in order to better understand local people. Understanding people's needs and interaction with the material world is a basic starting point for successful product innovation, especially in the BoP.

At the moment, various design tools (such as personas, cultural probes, scenarios and user profiles in context-of-use) are available to capture insights related users' needs, aspirations and behaviour in their original contexts. Ethnographic research has shown increasing interest in business innovation processes by identifying how people interact with products, environments and services (Leonard and Rayport 1997). Design research techniques have evolved from uncovering what people do and say to what people make (Sanders, 2000). New techniques such as cultural probes (Gaver, Boucher et al. 2005) can introduce the end-user into the design process by co-design and get deeper information than the common focus groups or observational research methods. Many tools are design context tools are available, however most of them only have been applied in the "Developed Markets".

Currently we are testing and evaluating these kind of context tools in emerging and developing markets in practice (Rodriguez, Diehl et al. 2006; Rodriguez, Thompson et al. 2007). For example in the project IntoContext, we tested a wide range of context research tools like Shadowing, Role Play, Probes, Brainstorm, Generative Sessions as well as Focus Group in the context of East Africa. For more information see http://www.intocontext.org.

4. Conclusion and recommendations

The Base of the Pyramid, 4 billion people with a daily income of less than $3 per day, has been ignored sofar. The recent upcoming interest of large as well as medium sized enterprises to explore these markets to alleviate poverty and other sustainability problems as well as to exploit new consumer markets, is a big challenge for the design world. The challenge is the creation of accessible and affordable solutions to fit the local economical and socio-cultural preferences, without expanding the current of environmental resources. In order to do so, new design tools and methodologies for "Designing for the BoP" have to be developed and tested. Most of the challenges derive from the unfamiliarity with the local context and the distinct infrastructure in emerging markets. Researcher and designers should engage with the cultures directly in order to better understand local people and context.

Because of globalization and the upcoming importance of the BoP design professional as well as design schools should invest more in research and capacity building for "Designing for the BoP".

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A LOCAL ANALYSIS OF A GLOBAL CHALLENGE: A STEP TOWARDS UNDERSTANDING MOBILE PHONE CHOICE OF TURKISH UNIVERSITY STUDENTS

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Abstract

Mobile phone is becoming the main communication tool for many societies and cultures, and the decision of how to localize products still remains as a phenomenon for many –especially for developing and underdeveloped- countries. Adaptation or standardization of products has been the concern of firms, where there is a tradeoff between answering the needs of the local market versus achieving economies of scale. Thus, firms may try to decide upon which mobile phone models to export overseas according to the needs of the local market. This necessitates analyzing the user profile in the local market so as to avoid experiencing any disasters in the market due to inappropriate products being inherent in that market.

Due to importance of analyzing the decision making mechanism of users in a developing country, a study is conducted in Turkey to evaluate relative importance of listed mobile phone selection criteria and then analyze how users approach towards making mobile phone selection. The research is conducted in two phases in order to obtain more realistic results. Analysis of these results is reported in order to give an idea about what could be done to improve market success and reduce design disasters in overseas markets.

Introduction

A number of critical issues relating to the international marketing activities of these organizations still remain unresolved. Perhaps the most controversial concerns the fundamental question of whether to offer a marketing mix program abroad identical to that supplied domestically, or to adapt it to the specific requirements of foreign markets. Obviously, the answer to this question is not an easy one, since it can have serious implications on the firm's financial performance, competitive advantage and even survival in global business (Leonidou 1996: 53).

Multinational corporations may prefer to differentiate their products. The need for product differentiation is more visible for technological products because of the dynamism of these markets which necessitates catching up current trends and technologies while staying culturally acceptable and appreciable. This need is even more spectacular in mobile phone sector due to widespread usage of mobile phones by a broad range of consumers with differing tastes who are in need of different functional and emotional elements. Therefore, the specifications of mobile phone manufacturers' products for each market segment should be defined according to the categories they set such as differing lifestyles, age groups and social status by thinking on a global scale. However, when

it comes to designing and/or marketing of these products, national characteristics should be taken into account so that the firm stays customer oriented and thus market success is more probably achieved.

Turkish mobile phone market is an exemplary case where multinational corporations dominate the market. The problem is that these manufacturers' phone models launched to the Turkish market are not designed, nor are they localized by considering the special needs of Turkish users. Assuming that not even an incremental change in the functional characteristics or aesthetic appearance of mobile phones is foreseen to be needed and tried to be made, research on the decision making mechanisms of users when choosing a mobile phone is necessary in order to understand users and thus serve them at best. Research concentrates on only the design disasters within a relatively metaphoric framework where only issues regarding localization of standardized products are questioned. Disasters that may occur at the environmental level are left out of scope.

Importance of Localization in Mobile Phone Market

There is an international acceleration in the world economy while competition is increasing on a global scale. Some reason for this acceleration can be cited as technological advancements, improved living standards, trade liberalization and economic integration (Leonidou 1996: 53). In order to be competitive, firms have to try serving their customers at best. For global firms operating at several countries, the question is whether to offer standardized products by universal marketing mix strategies, or to locally adapt their products. If products are going to be tailored to the individual needs of each overseas market, which products will be adapted to what extend is the primary concern.

Product standardization is more applicable to industries with a high rate of technological change, since there may not be much time to adapt products due to the dynamism of high-tech markets (Leonidou 1996: 58). But this does not mean that firms should deny the needs of local users and/or customers. Time may be a constraint for a radical change in product but as Ramarapu et al. (1999: 99) states, standardization of a product also allows some room for local flexibility. Thus, changes in product because of localization efforts has to be made fast. This may be possible by knowing and understanding the cultural values and idiosyncratic characteristics of the customers in that market beforehand, which necessitates making user researches.

The adaptation philosophy necessitates being more customer-orientated because the buyer and user behavior and market characteristics have to be evaluated systematically so as to understand local needs. The outcome of such an approach results in profit maximization, because revenues accrued from marketing mix modifications may raise by more than adaptation costs. There are also side benefits of localization strategies such as energizing creative thinking and innovativeness within the firm. Such benefits are a consequence of trying to find new ways to satisfy the needs and requirements of local customers, and adjusting product design activities as well as marketing activities (Leonidou 1996: 54).

Supporters of the adaptation (or localization) philosophy state that the primary reason of localization is due to the inherent complexities and dissimilarities involved in operating in the international marketplace, particularly as regards macro environmental forces, consumer behavior, usage patterns and competitive situations (Leonidou 1996: 53).

Need for localization is also important in terms of understanding users' attributes. Blackler et al. (2003: 492-493) state that products should be designed in such a way to minimize misuse. However, designers may over impute their special knowledge onto the user. Difference between users' knowledge and designers' knowledge may constitute a larger gap when users and designers do not have much common in their cultures. This is due to the effect of false consensus. One way to minimize misuse is to analyze potential users' activities and understand them in order to build up preventive strategies towards user satisfaction (Stanton and Baber: 364; Blackler et al. (2003: 492-493). These facts make the importance of cultural studies more important. Bouwman and Duin (2003: 9) point out that such studies should be conducted as early as possible, since when the case is designing technological products, substantial time should be devoted for the product design and development process.

The need for localization of products is even clearer when different cultural and competitive environments, different perceptions, and different levels of product acceptance problems in standardized strategies are considered. Evidence suggests that culture plays an important role in understanding and shaping the wants and needs of consumers so that the value they obtain from that product is maximized (Raymond et al. 2003: 13-14). Value of a product can be defined as whatever it is that the customer seeks in making decisions as to which product to buy (Zeithaml 1988: 13). This definition reveals out the importance of analyzing decision making mechanism of users, and gives a clue to firms almost all of which aims to maximize their profit by maximizing the value customers so that they do not hesitate to include the role of culture when developing strategies.

Powell (2005) has conducted an interview with Dan Steinbock, an affiliate researcher at Columbia Institute for Tele-Information at Columbia Graduate School of Business, in which he reveals out the need of localization in mobile phone sector as such:

> Most industries face globalization and localization pressures. The mobile industry is no exception. Globalization means standardized, universal, homogeneous products but people want personalized products and services. Historically, technology innovation and market innovation used to occur primarily in one country - the USA. Today mass marketers such as Coca-Cola and Procter & Gamble test the advertising potential of mobile phone markets in China or Japan before using what they have learned in US and European markets. Over time, this does not mean more convergence, but greater divergence (Powell 2005: 45).

Dan Steinbock's words not only emphasis the importance of user researchers in mobile phone sector on its own, but also its consequences on different sectors due to the fact that mobile phones have become an irresistible part of many people's life that can be used as a marketing medium. Firms are becoming aware of conducting researches about local analysis of mobile phones, and such researches have better been supported with academic researches that nurture firms' knowledge about this phenomenon.

For significant advances to be made in this field, an integrated approach is needed for the conceptualization and measurement of the determinants of new product strategy, product localization strategy and marketing strategy. A fundamental part of such an approach is the refinement and validation of measurement scales (Julian and O'Cass 2002: 1), for which this study plays an initiator role in terms of defining these measures and making a pilot study about how these measures can be transformed into beneficial knowledge for firms and researchers.

Methodology

The aim of the study is to analyze mobile phone selection of users and underlying reasoning of the selection made. Decision making mechanisms of university students as young users is analyzed. Because there has to be a selection is made, the methodology is based upon setting up a lab experiment, where users are asked to make a decision by selecting between different mobile phones. In order to be able to observe the decision making mechanism of mobile phone users, the mobile phone selection criteria have been categorized in the decision tree shown in the Figure 1.

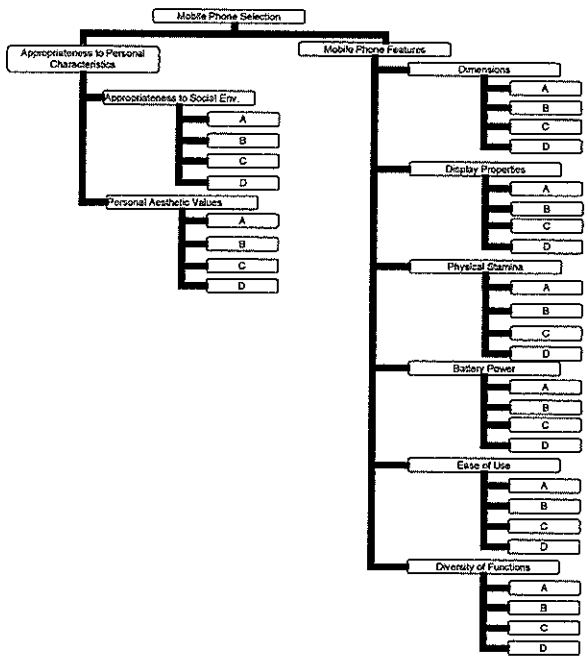


Figure 1. Decision tree used for AHP

The goal is defined as selecting the most appropriate mobile phone. The most important two decision criteria in mobile phone selection have been determined as the appropriateness of the phone to personal values of the user and appropriateness of mobile phone related features to the user. Personal values have been measured by appropriateness to the social environment of the user and personal aesthetic values of the user. Users are asked to evaluate the appropriateness of the mobile phones in terms of sub-criteria such as: dimensions, display properties, physical stamina, battery power, ease of use, and diversity of functions.

Due to inability to assess all the mobile phones on the market at the time of research, the number of mobile phones that are going to be evaluated by users have been limited with four. The aim of this research is not to drive generalizations, but to have an insight about how the decision making mechanism of university student young users work, and to see whether their decision making mechanism are consistent or not. For this purpose, upcoming mobile phone models of a well-known brand that have not been released to the market have been selected so that effects emerging due to former beliefs about phone models does not intervene into achieving the aim of the research. These four models have been encrypted as model A, model B, model C, and model D. One photo for each mobile phone is given below in Figure 2.

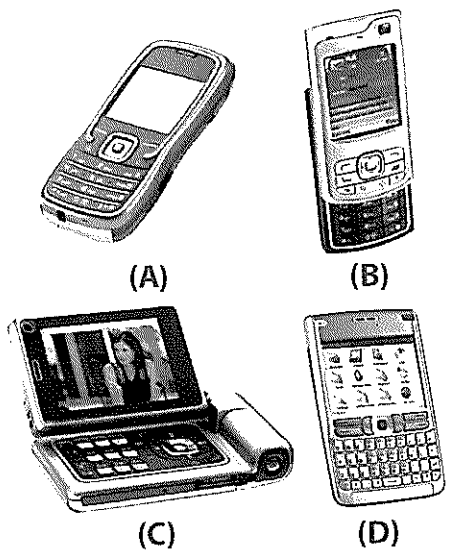


Figure 2. Phone models A, B, C and D

The technical specifications of these phones models are not primarily related with the research aim of this study. But it would be helpful to give an idea about general characteristics of these mobile phones. Model A is a phone especially designed for use in sportive activities with 2 MP cameras, including sport functions and exercise data, which withstands bumps, dust and water splashes. Model B is a phone with 3MP camera with 20x zoom function, which is over than expected for similar mobile phones. Wireless LAN and office document readers are also included in this mobile phone. Model C has an embedded 2MP camera, and has a high quality screen designed for mobile fun since this is the first phone of this brand that has mobile tv function. Model D has a keypad similar to of palms, with each button assigned only one letter. The reason for this is that this phone is especially designed for business purposes, and searching the web, sending e-mails and preparing office documents is the main concept of this phone.

The study is conducted in two phases with two different samples so that testing effects and maturity effects are minimized. Both samples consisted of young mobile phone users who are university students. The reason why young users have been chose is due to the fact that they are more eager to follow new technologies and they have a greater tendency to use new technological devices. And, in order to increase the consciousness level of young users, samples are selected among university students.

Users in the first sample composed of 100 university students are asked to evaluate the degree of relative importance of decision criteria and sub-criteria. This part of the study is very important because the users' mobile phone selection decisions based on each sub-criterion that will be made by the second sample will be weighed by the relative importance values determined by the first group. For this reason, the first part of the research is of vital importance, and the size of the sample had to be relatively larger. For this reason, the importance values of these criteria are adapted and calculated from the master thesis of Donmez (2005: 92-104).

The second sample consisted of 35 university students, who are asked to make pairwise comparisons between four mobile phones according to each sub-criterion by a questionnaire, which means six pairwise comparisons (A-B, A-C, A-D, B-C, B-

D, C-D) for each sub-criterion and 48 pairwise comparisons (6 comparisons per sub-criterion* 8 sub-criteria) in total. Potential users of these upcoming mobile phones are given specifications of these four mobile phone models compared in a matrix which also included pictures from different angles. Specifications given included detailed information about innovative features of the phone, its dimensions, display properties, battery information (such as stand-by time), and the functions it can perform.

Users are asked to make pairwise comparisons on which mobile phone they will prefer, and then asked to state the amplitude of selecting that phone over the other phone over a scale of nine developed by Saaty (1980: 54). The answers of the respondents are evaluated by the software tool Expert Choice, and results of this analysis are given in the next section.

Findings of the Study

The analysis of the first questionnaire indicates that appropriateness of the phone to personal values of the user is considered as less important than appropriateness of mobile phone features to its user. It is seen that appropriates of mobile phone features to its user is about three times more important as tabulated in Table 1.

A similar analysis has been made for the determination of the importance of sub-criteria under the main criteria. Results indicate that university students consider battery power and physical stamina as the most important factors followed by ease of use and dimensions of the phone respectively. Display properties and diversity of functions are seen as the least important factors in terms of mobile phone features as seen in Table 2.

Table 1: Importance of primary criteria

Criterion	Importance of the Criterion
Appropriateness of the phone to personal values of the user	77.4%
Appropriateness of mobile phone features to the user	22.6%
Total	100%
inconsistency: 0.00	

Table 2: Importance of sub-criteria regarding appropriateness of phone features to its users

Criterion	Importance of the Criterion (Global)	Importance of the Criterion (Local)
Battery power	18.6%	14.4%
Physical stamina	18.6%	14.4%
Ease of use	17.1%	13.2%
Dimensions	16.5%	12.8%
Display properties	14.7%	11.4%
Diversity of functions	14.5%	11.2%
Total	100%	77.4%
inconsistency: 0.00		

Results of the analysis in Expert Choice indicate that aesthetic considerations about a phone is more important than appropriateness of the phone to the social environment the user interacts with. Table 3 below gives the percentage of importance about these sub-criteria.

Table 3: Importance of sub-criteria regarding appropriateness of the phone to personal values of the user

Criterion	Importance of the Criterion (Global)	Importance of the Criterion (Local)
Aesthetic values	54.0%	12.2%
Appropriateness to user's social environment	46.0%	10.4%
Total	100%	22.6%
inconsistency: 0.00		

Second part of the research is concerned with the pairwise comparisons made for each criterion. Tables below show the overall results of these comparisons. The cells indicated with "*" show that the phone model on the column is preferred by the magnitude written in that cell; otherwise, the phone model on the row is preferred. The diagonal elements in gray are indicating the comparisons of the phone with itself, thus

they have the value 1 by default and not written on these cells because of this reason. The remaining six cells that are highlighted with gray have the inverse value of the cells that are in symmetry with. The value "i" indicates the inconsistency value calculated by Expert Choice. Inconsistency values below 0.10 are acceptable, thus it can be stated that the results obtained in our survey is within acceptable limits.

Table 4: Pairwise comparisons of mobile phone models with respect to (a) dimensions; (b) display properties; (c) physical stamina; (d) battery power; (e) ease of use; (f) diversity of functions; (g) appropriateness to user's social environment; (h) aesthetic values.

	A	B	C	D
A		1.0	2.0*	4.0*
B			2.0*	6.0*
C				3.0*
D	*i:0.01*			

(a)

	A	B	C	D
A		7.0*	8.0*	6.0*
B			2.0*	1.0
C				4.0
D	*i:0.05*			

(b)

	A	B	C	D
A		3.0	2.0	4.0
B			1.0*	3.0
C				2.0
D	*i:0.02*			

(c)

	A	B	C	D
A		1.0	5.0*	7.0*
B			5.0*	6.0*
C				4.0*
D	*i:0.06*			

(d)

	A	B	C	D
A		1.0	1.0	2.0
B			1.0	3.0
C				3.0
D	*i:0.01*			

(e)

	A	B	C	D
A		5.0*	6.0*	1.0
B			1.0	2.0
C				3.0
D	*i:0.04*			

(f)

	A	B	C	D
A		4.0*	5.0*	1.0
B			2.0*	5.0
C				5.0
D	*i:0.02*			

(g)

	A	B	C	D
A		5.0*	6.0*	1.0
B			2.0*	6.0
C				7.0
D	*i:0.01*			

(h)

Expert Choice analysis with respect to achieving the goal of selecting the most appropriate mobile phone is made by weighing the results of the second questionnaire by the first one. Figure 3 summarizes the results of the analysis.

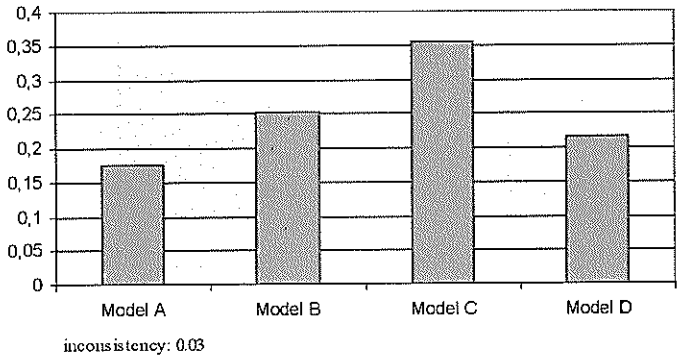


Figure 3. The overall analysis of mobile phone models

Model C with a percentage of 35.5 is the mobile phone that is rational to select under these stated circumstances, it is followed by model B with 25.2%, model D with 21.7% and model A with 17.6%. Figure 4 shows the detailed analysis about which primary criteria dominate the selection at which rate. As seen from the figure above, model C is considered as the most successful one both in terms of the phone features to its users and in terms of appropriateness of the phone to personal values of its users. Model B follows a similar pattern with a lower amplitude. Model A and D are not seen as weak in terms of their functions' appropriateness when compared with model B and C. Model A and D shows a different pattern than the other two models, where A and D are more powerful in terms of their functions than their appropriateness of personal values associated with these phones.

It may be useful to analyze from which sub-criteria dominates model C, and where the other models fail. Detailed analysis with performance graphs shown below in Figure 5 and 6 gives an idea about users' underlying reasoning about why model C has been selected. Figure 5 shows that model D is considered more powerful in terms of dimensions and battery power. Model B is also dominating model C for the physical stamina criterion. However, because model C is very powerful in other remaining criteria, the weighed results still state that model C is the most logical decision. It can again be observed that model B follows a similar pattern with model C in terms of appropriateness of phone features to its users.

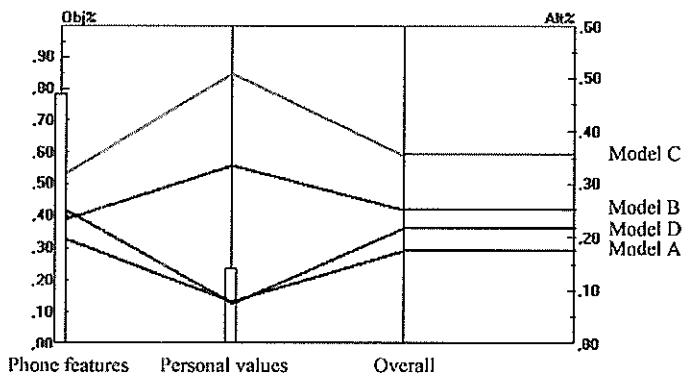


Figure 4. Performance of mobile phones in achieving the goal

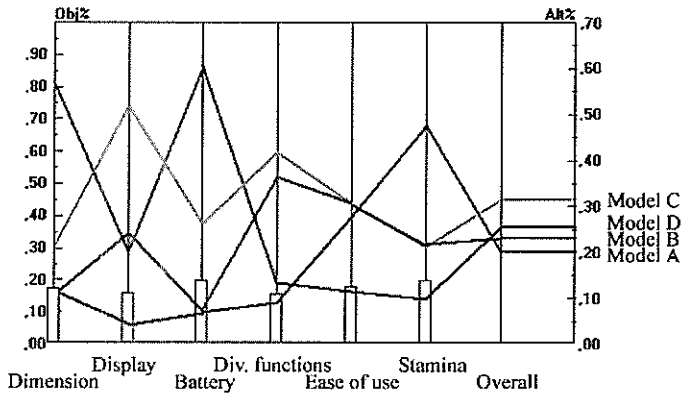


Figure 5. Performance of mobile phones in terms of appropriateness of the phone features to its users

Choices made between mobile phones according to appropriateness to the respondents' personal values reveal out that there is a strong correlation between appropriateness to social environment and aesthetic values as seen in all of the four phone models. Model B follows Model C that has a significant difference than the other models. Model A and D show a similar pattern in terms of these sub-criteria, since their performance lines coincide.

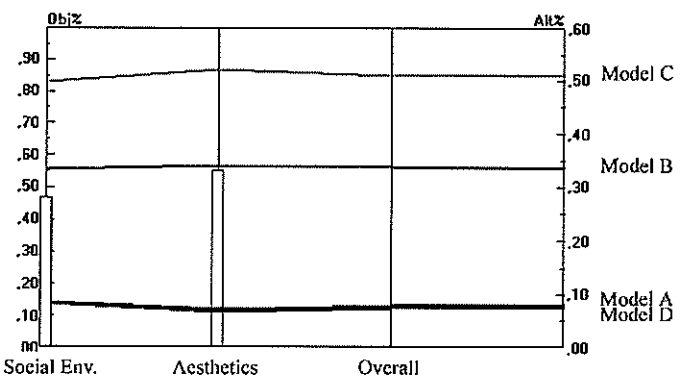


Figure 6. Performance of mobile phones in terms of appropriateness of the phone to personal values of the user

Conclusion

Foreign firms marketing their products to overseas markets should be aware of the cultural resistance they will face. What is more, aligning products with the cultural facts in that country poses many advantages such as reducing the risk of failure, increasing market share and getting new inspiring ideas from that culture that can trigger innovativeness. However, adaptation of products to every country and every culture is not possible and feasible. Since firms have to make mass production in order to make use of economies of scale so that unit production costs reduce considerably. Thus, firms may choose between two strategies: they may export and market their products by taking cultural acceptance into account, or they may try to make minor modifications in the product about the features that will otherwise not be much welcomed.

As a result, analyzing local markets gives the opportunity of production planning and decision upon which models to export will be made on a more rational basis. When the tendency of multinational mobile phone brands dominating the Turkish market is thought, conducting such researches has the potential to reveal out design disasters and product failures beforehand more easily. As a consequence, firms will be aware of the excess unnecessary costs associated with exporting those models and control over the product range and market may be more effectively accomplished.

The analysis shows that there is much to do to improve the

usability of mobile phones in order to prevent design related disasters since users are giving priority to battery power but the selected phone is not the model taking the lead with respect to this criterion. One reason for this may be dissatisfaction about ease-of-use in almost every phone forcing the decision to be made according to other criteria, even though ease-of-use is very important for most Turkish university students.

Limitations of the Study and Future Research Directions

The analysis have been restricted by only four phone models because the aim of this study is not to drive generalizations but to emphasize the importance of cultural factors and to show what kind of a methodology can be applied for forecasting the needs of the market. The model developed provides an insight but more phone models can be included in the analysis in order to make a more complete model.

Price of these mobile phones, an important criterion in users' decision making mechanisms, has not been included in the analysis. The reason is that there is incomplete information about prices of these phones because these phones have not been launched to the Turkish market. This research may be made after these phone models have been launched on the market with a bigger sample size especially for the second part of the research. It may be expected to find innovative ideas emerging from this research by analyzing different culture than where these mobile phone manufacturers are located, and Turkey may be an interesting case for such a study. Thus, cultural effects may need to be analyzed deeper, and further researches may be directed not towards young users with high level of technological knowledge, but also to other layers of the society.

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POSTWAR VISIONS OF APOCALYPSE AND ARCHITECTURAL CULTURE: THE ARCHITECTURAL REVIEW'S TURN TO ECOLOGY

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Abstract

In the postwar era H. de C. Hastings, the owner and editor of the English periodical (until 1971) The Architectural Review (AR), saw mankind facing demise via its own scientific creation, the atom bomb. Hastings's editorial policies for the AR were highly influenced by impending nuclear disaster during the Cold War and the decline of the British Empire in this world divided into the mandates of two superpowers. While the postwar period brought disbelief in the promise of emancipation through technology and science for those like Hastings, for others there was all the more reason to believe in these ideals with the dawning of a consumerist society and the development of pop culture.

Within this cultural context AR aimed to develop and sustain an environmental culture as a holistic strategy in order to respond to planning problems. Targeting not only architects but local and national authorities as well as the man on the street, AR launched a series of campaigns that aimed to increase environmental awareness against postwar industrial transformation and the rise of consumerism.

After the decline of affluent consumer society of the 1960s and the devaluation of the pound in 1967, AR revamped it structure and contents and launched its "Manplan" campaign reacting against economic crisis and environmental decline. Taking issue with "Non-Plan: An Experiment in Freedom" written by Reyner Banham, Peter Hall, Paul Barker and Cedric Price in New Society in 1969, "Manplan" demanded centralization and comprehensive planning against decentralization and dispersal as a means of planning democracy. According to the editors scientific progress enjoined to consumer culture and ever-expanding economic growth brought a ruthless exploitation of resources as well as destruction of the natural landscape. Before the journal itself went into economic crisis and Hastings left the editorial board, the first issue of the pioneering journal "The Ecologist" themed "A Blueprint for Survival" was brought on the board's agenda by Hastings.

This paper focuses on the neo-romantic ideology that underlay the editorial policies of AR motivated by approaching environmental disaster and, in due course, that affected architectural discourse in Britain.

> [An] insane over-confidence in the specialised powers of metropolitan industrialism has brought us to the point where...the risk to human survival is becoming evident, [and] ...there is the clear impossibility of continuing as we are (Raymond Williams "The Country and The City" 1973, p. 301).

Introduction: Faces of Disaster

On 16th May, 1968 only a few weeks after the tenants had moved in, one side of Ronan Point collapsed due to a gas leak explosion, killing four people and injuring many. Ronan Point of Newham, London, was one of the many 'system-built' tower- blocks, easily assembled from pre-fabricated concrete elements bolted together like a kit of parts in a short time. Since World War Two, many high-rise blocks were built as an easy solution to the housing problem in Britain. High-rise blocks

were interpreted as synonymous with the Modern Movement, and the disaster had a significantly negative impact on the public's perception of Modern architecture and Modernism. Paralleling May 1968 riots in France, the disaster followed a decline in the British economy and a loss of confidence in the consumer society after the pound was devalued in 1967.

The 1960s can be characterized as a decade of conflicting trajectories. In these turbulent years, optimist belief in the emancipatory potentials of technology and consumer culture coexisted with prophecies of doom attached to the impending threat of nuclear warfare.

For some younger architects the sixties was a decade of plastics, of pneumatic structures, geodesic domes, hovercrafts, "scientific" housing patterns, expendability, and inspirational techno-gadgetry like moon probes. They wore blue jeans and t-shirts instead of double-breasted jackets and bow-ties, lived in the euphoric world of drugs and pop icons, imagined future cities that walked and talked, flew and plugged-in. They believed in the power of indeterminacy and experiments in democratic planning, in freedom via consumer choice and sometimes revolt. For others it was a time of resistance against much of the above: a decade of Italian townscapes, the reappraisal of vernacular architectures and folk art, the rise of environmentalism and the green movement, the campaign for nuclear disarmament, heightened sensitivity towards planned use of world's economic resources and a split in socialist politics. But for all in Britain, it was a decade of unexpected economic prosperity followed by a shocking decline.

British architectural history regarding the decade from the 1970s until today still focuses on the "avant-garde" discourse of the time, which was closely connected to the rise of popular culture, consumerism, and the technological development brought about by the post-war military-industrial complex. Against this limited emphasis, cultural histories illuminate a much broader field forcing the architectural historian to reevaluate this historiography and to unearth the period's conflicting dynamics. It is undeniable that in this period pop culture and mass media dominated the cultural scene more than ever before in Britain, while such development was closely followed and criticized by different ends of the ideological spectrum.

Starting from 1946 *The Architectural Review (AR)* was run by an editorial board that pursued a continuous editorial policy till its owner and chief editor Hubert de Cronin Hastings retired in 1974. To summarize briefly, this editorial policy consisted of (1) creating an urban design idiom by reinterpreting the late 18th century picturesque theory titled "Townscape," (2) the appraisal of local vernaculars as a cultural resource for modern architecture to develop anonymous but diversified regional vocabularies, and (3) the construction of an architectural historiography that supported and justified these intentions. This editorial policy was formulated by Hastings, (owner and editorial director of the Architectural Press in the period between 1927-1973, chief editor of *AR* between 1927-1973), J.M. Richards (joined as assistant editor in 1935, editor between 1939-1970), and Nikolaus Pevsner (editor between 1941-1970). It resulted in several series titled "Townscape" (1949) "Outrage," (1955) "Counter-Attack," (1956) "The Functional Tradition" (1957) "Manplan" (1969) and finally "Civilia" (1972).

By the second half of the 1950s the urban design emphasis in *AR*'s townscape policy was expanded to cover the broader consequences of planning, or lack thereof, in the larger environmental scale. This was not only due to a need to expand the limited focus of townscape in order to address planning in a larger scale, but also to increase awareness of impending environmental disaster. During the Cold War era H. de C. Hastings, saw mankind facing demise via its own scientific creation, the atom bomb. Hastings's editorial policies for the AR were highly influenced by the threat of nuclear warfare and the decline of the British Empire in a world divided into the mandates of two superpowers. Having witnessed the destruction of World War II and convinced of the urgency of putting an end to the arms race during the Cuban missile crisis, the period brought disbelief in technology and science's promise of emancipation for Hastings.

Within this cultural context *AR* aimed to develop and sustain an environmental culture as a holistic strategy in order to respond to planning problems. Targeting architects, local and national authorities and the man on the street, *AR* launched a series of campaigns that aimed to increase environmental awareness against postwar industrial transformation and the rise of consumerism.

This paper focuses on the neo-romantic ideology that underlay the editorial policies of AR motivated by approaching environmental disaster and, in due course, that affected architectural discourse in Britain. *AR*'s approach attempted to re-articulate the relationship of man to nature as formulated by 18th century British Romanticism, in opposition to seeing the environment as an object of natural sciences and a resource that can be taken under control and exploited by advanced technology. Based on my archival research, I will emphasize the role of Hastings' manuscript "The Unnatural History of Man" as a programmatic palimpsest for *AR*. I also aim to show how *the Review* attempted to overcome the stereotypical clichés of resistance to progress and revivalism attached to its policies by pointing to the necessity to incorporate the means of science and technology into an environmentalist struggle.

I will illustrate my points by making specific references to the last two campaigns of *AR* under Hastings' editorial rein between 1969 and 1972, named "Manplan" and "Civilia." I will then discuss his late ideas that never came to materialize as editorial policy, that is, his turn to Ecology as a new guiding framework for environmental planning and architecture.

1. A Neo-Romantic Society: Hastings' Britain

The Architectural Review's concern with the environment aligned with the building of a modern city under "Townscape" was the reflection of a larger social and cultural project, the precepts of which were alluded to but not explicitly stated. The major figure that laid out this project was Hubert de Cronin Hastings. Hastings is referred to as a "self-concealing genius," by Nikolaus Pevsner and credited by J. M. Richards as the originator of the interest in the larger environment (Pevsner, p. 318; Richards, pp. 190-191). It is not clear whether everyone involved in *AR*'s editorial board of was aware of Hastings's project completely, or of the ideological ramifications of his intentions. Albeit partially, the editorial board was convinced that this project's environmental ideals ought to be followed, and its holistic cultural program be translated into the editorial policies of *the Review*. This social and cultural project was explained in a manuscript written by Hastings, entitled "The Unnatural History of Man" under the pseudonym Ivor de Wolfe. Including some of his writings from the early 1940s, Hastings continuously revised, reedited and shortened this text to another version which was published under the name "The Alternative Society" in 1980[1].

a. The Unnatural History of Man

There is no evidence as to when exactly Hastings wrote "The Unnatural History of Man" other than "October 1958" typed on one of the chapters by his secretary. The manuscript itself is more than 880 typed pages and the conclusion is missing; or maybe Hastings never finished the initial manuscript. The text, however, incorporates some of the similar themes and even paragraphs of Hastings's article "Townscape: A Plea for an English Visual Philosophy Founded on the True Rock of Sir Uvedale Price," which stirred a lot of controversy when it was published in *AR* in 1949. In my opinion, "The Unnatural History of Man" was a palimpsest, written over and over, that incorporated Hastings's thoughts from the late 1940s to the second half of the 1950s. This manuscript also became the backbone of "The Alternative Society" of 1980.

At the time Hastings's manuscript evolved, Britain's role as a world power as well as its social structure changed dramatically. Assuming a lesser role in comparison to the two rising global powers of the Cold War, the Empire shrank gradually and became a "Commonwealth" of semi-independent nations. The economy did not get a major relief before the 1960s -the age of pop and the rise of mass culture- and sinking even worse in the late 1960s. The increasing influence of the United States on British culture started to become a disturbance for some of the British intellectuals, although others were willing to embrace it in the name of liberalism against the paternal welfare state.

The second half of the 1950s also witnessed the New Left's rise in Britain.[2] Britain's imperial aspirations concluded as a

[1] The original manuscript is in the possession of Miss Priscilla Hastings, the daughter of Hubert de Cronin Hastings, who kindly allowed me to see it.

[2] The emergence of the New Left is generally regarded as a result of British intellectuals' disenchantment with Stalinist politics and a move away from the dominance of the USSR for redefining socialist theory and practice. On the New Left, see Dworkin (1997) and Kenny (1995).

result of the Suez Canal crisis. The invasion of Hungary and Khruschev's denigration of Stalinist policies created a sense of betrayal in the British left and evoked the need for change to come from outside the home of the October Revolution. According to Dennis Dworkin, the New Left "came together in response to the Suez and Hungary crises in 1956 and then consolidated in a shared commitment to the Campaign for Nuclear Disarmament (CND) of the late fifties and sixties. New Left activists attempted to create a new political space on the Left, and their project was critical to the development of radical historiography and cultural studies in Britain"(Dworkin, 1997, p.45). Hastings's manuscript, coming from the pen of a high-middle class, public-school-educated, late Victorian gentleman, echoed the then-contemporary developments in the world. His commentary on the contemporary scene was combined with a historical evaluation which stretched from England before the industrial revolution to his day.

b. A Portrait of Doom

The evidence shows that Hastings worked on his manuscript through the fifties to the seventies until he published a much narrowed down version in 1980, entitled "The Alternative Society." Written in the form of a reformist manifesto, it is impossible to summarize the contents of the manuscript within the confines of this paper. Throughout the years that it was being revised, however, the central message of the manuscript was kept intact: A social crisis and a state of paranoia had enveloped Western civilization. The British had to assume a pioneering role to overcome this crisis and stop the approaching disaster which could bring the end of human civilization.

In the introductory chapter entitled "New Elizabethan" Hastings set out by drawing a portrait of doom. He argued that there was a prevailing angst in the people of his day, although advocates of technological progress came out with the promise of a better future everyday. His pessimism stemmed from the fact that a holistic vision of life was irrecoverably lost under the influence of the cult of expertise and the pursuit of progress merely via science and technology. A new comprehensive ideological stimulus was needed in order to initiate a "collective come-back." It was the duty of the British for Hastings to propose a new utopian ideal to overcome the Cold War division, like they had offered before and during the birth of the Industrial Revolution via Romanticism.

c. The Neo-Romantic Society

Hastings believed that Britain could reinvigorate British cultural traditions and animate them with a reformist spirit to give a utopian message against the two prevailing political models: the savage capitalism represented by the US and the managerial and authoritarian socialism as represented by the USSR. The new British society could instead be modeled on the political and cultural ideals of the "Cromwellian revolution" of the 17th century by emulating the reformist political spirit of Oliver Cromwell. Idealizing the protectorate, Hastings argued that Cromwell's vision could be creatively reinterpreted in order to formulate a pluralistic democracy that would safeguard the welfare of every individual as well as that of the natural environment.

In the society he imagined, scientific rationality and technological determinism would only play a secondary role on the human condition. The picturesque, "a radical, anarchist and disorderly ideal... [and] a tremendous event in the long apprenticeship of democracy," was to be the aesthetic metaphor of libertarian democracy. Hastings even proposed an economic model to reorganize the relationships between the individual, the State and the private sector. In this model the roles of the individual and of the State were configured by an analogy to the 18th century gentry. The model conceived what he called a "New Elizabethan" state, as the balancing mechanism that would serve the guardian for the individual against the greed of capitalism. Like the gentry guarding those who cultivated and lived on his land, the State would guard the collective Estate. This collective estate was the total environmental resources of the Nation, owned jointly by the citizenry and the State. The individual by having a stake in the collective Estate would rise to the level of the gentleman as well. There were rare instances in the pages of *AR* that such analogies would be openly stated. In the August 1956 issue, Gordon Cullen's study of Bingham's Melcombe—a case of wire routing through the rural landscape—argued for "improvement" as a vital strategy for the environment:

The curse of the English landscape is the *absentee landlord*. The old landlord, the man who created it, has been taxed out of existence and the new landlord, local and national authority, lives in town or suburb. Consequently that sense of personal responsibility arising from a knowledge and love of a particular piece of countryside is missing and is replaced by a beneficent but remote control: the difference between a parent and a foster parent. (Cullen,1956, p.104)

One of the aims of *AR*'s environmental policy, therefore, was the transference of these traditional values of the gentry to the citizen and to the planning authorities, and to create a cultural continuity absolved from its class basis. The ideas in "The Unnatural History of Man" would be more explicit in the later campaigns. Manplan became the first direct initiative for Hastings to disseminate these views within a demand for reform, and Civilia, a fictional new town and the swansong of Townscape, became the dream in which his ideals were given shape in the early 1970s. Before we move on to these campaigns I should briefly explain how *AR* attempted to mobilize environmental consciousness by its earlier effort.

2. Mobilizing Environmental Consciousness

After the Conservative victory in the 1951 elections, the priority given to planning by the previous Labor government gradually faded. At this time, AR was fighting a battle on two fronts, one against the Town and Country Planning Association's insistence on low density policies and their implementations for the new towns, and second, the government's move away from national planning.

In "Outrage," the June 1955 special issue under the editorship of Ian Nairn, *AR* warned its readers against the blight of British landscape.[3] Ian Nairn (1930-19B3) was not an architect or a historian like his fellow AR editors or contributors. He was educated in mathematics and was a National Service Royal Air Force pilot. Nairn's knowledge of Britain and environmental problems mostly stemmed from his awareness of the country surveyed from the air (King, 1996). His being an outsider and his sensitivity to the environment must have especially appealed to Hastings, since he believed that *AR* had a duty to develop such sensitivities in its readers even if they were not architects.

In this issue, the journal predicted a bleak future for the British landscape under misguided forces of planning machinery and development. The environmental mess encroaching upon the new towns and their surroundings was called "Subtopia"[4]: Abandoned air fields as remnants of war, miles of concrete, wire and asphalt with repetitive homes of ribbon development, precious agricultural land greedily subsumed by pollutant industrial sprawl. The whole issue was devoted to a visual survey of "outrages," that scarred the face of the land from Southampton to Carlisle, from the very south of Britain to the north, inculcating Hastings's prophecy of doom.

In the conclusion, titled "Summing Up," *AR* called citizens to action. The salvation of the environment meant the salvation of mankind:

> What must we do to be saved? These pages offer a Manifesto and a call to action, a programme and a checklist of malpractices for which the opponents of Subtopia must be ever on the alert. The programme calls for the development and enhancement of the differences between places, it is oriented towards topographical responsibilities, rather than administrative ones, what can be seen rather than what it says on a piece of paper... The action is needed now... from all of us. The defence of the individuality of places is the defence of the individuality of ourselves. (Outrage, 1955)

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[3] Nairn later wrote for *the Observer* and *the Sunday Times* and collaborated with Pevsner on the Buildings of England series for **Surrey** (1962) and **Sussex** (1965). Nairn's contribution to architectural discourse has not been thoroughly researched. In his memoirs Richards, understandably, refers to him as "Hastings's man more than mine." (Richards, 1980, pp. 190-191) His "**Nairn's London**" by Penguin (1966) and "**Guide to Modern Buildings**" (1964) for London Transport, has proven to be very popular (King, 1996).

[4] Subtopia: Making an ideal of Suburbia. Visually speaking, the universalization and idealization of our town fringes. Philosophically, the idealization of the little man who lives there (from suburb+utopia)." See "Outrage" 1955, p. 365. The term subtopia later became very popular and started to be used for monotonous urban sprawl.

In *AR*'s message, the citizen had become one with his environment, the environment had become the home of the nation. Hence, *AR* urged the citizens and the local authorities to condemn "Subtopia" and aimed to mobilize them to rehabilitate the damages. The campaign's ultimate intention was to make a "sufficient [number of] people sufficiently angry" and to bring down the fall of "Subtopia" (Ibid, p. 393) In the concluding manifesto for the "layman" *AR* stated:

> Don't be afraid that you will be just one individual registering dissent. It is your country that is being defaced; it belongs to you, and as an individual amongst fifty million individuals, not a 'set of income groups' or an electorate (Ibid, p. 451, italics in the original).

By this patriotic call, Outrage aimed to mobilize the whole population to claim their democratic right to the environment independent of ownership, class or status. It did not matter whether one owned the land or simply enjoyed it as a visitor; as a patriot the responsibility fell on everyone's shoulders. The issue ended with a "checklist of malpractices" addressing the "layman." The checklist was a set of questions to be asked about the towns, the country, the suburbs and the wild. It would provide the necessary public surveillance to keep development and "wrong" planning practices from "defacing" the land. Every reader that heeded the message would become the agent of the anti-Subtopian campaign. *AR* also demanded that local authorities commission architects to oversee visual control in the environment and to police Subtopia.

One year later, another special issue called "Counter-Attack," again under Nairn's editorship, was published to cure "public helplessness" against subtopia (Counter-Attack, 1956). While Outrage claimed to diagnose environmental illness, Counter-Attack hoped to provide the antidote for the cure. Counter-Attack construed the public as a body of people uneducated in environmental visual qualities, speechless victims of the planning machinery detached from the decision-making institutions. Following Townscape pedagogy, Counter-Attack collected precedents into a case-book. These precedents, however, hoped to illustrate how certain solutions succeeded in "bringing modern life to terms with the landscape" and "to arm the public against the wrong way and [provide] examples of the right way of doing things."(Ibid.)

Counter-Attack suggested that "a team of expert planners and architects inside the Ministry of Housing free of administrative ties" teach how "to think visually and to reword the planning legislation" (Ibid. p. 433). As a result, *AR* hoped "Townscape" pedagogy would infiltrate into the very center of the planning machinery in order to curb sprawl and to check the undesired impact of "subtopia." *AR* also urged the establishment of a body of financial aid for countryside preservation, based on the example of the "Historic Buildings Council" for the townscapes and landscapes that could act as "live pattern-books" for the future.

In the conclusion, "A Vote of Thanks" addressed the authorities which responded to the call to rehabilitate "Subtopia," listing and honoring certain county planning authorities, preservation societies and individuals (Ibid, p.407). This note in Counter-Attack testified to the fact that within the year that passed, Outrage had managed to reach local authorities and organizations. The success of the campaign encouraged the continuity of *AR*'s propagandistic discourse.

Six months after the publication of Counter-Attack in June 1957, *AR* announced the opening of a "Counter-Attack Bureau" on the cover of the Review. Intended to serve as "a watch and ward service for the good character of visual England," the bureau would help the so-called "victims of Outrage" by offering them consultation for their planning needs and complaints. It meant that via the consultancy of Gordon Cullen and Ian Nairn, AR would be directly involved in the planning problems brought into attention by its readers. Two years later, Nairn published a progress report of the Bureau (Nairn, 1959, p.71). The Bureau was frequently consulted. According to Nairn, two hundred cases were sent to *AR* only in 1958. Outrage remained a permanent feature of *AR* as a section and was emulated by other architecture periodicals during Hastings's ownership.

3. Manplan vs. Non-Plan

Only fifteen months after the collapse of Ronan Point, AR drastically revamped it structure and contents and launched its "Manplan" campaign against economic crisis and environmental decline. Reacting against the frustrating results of modern planning, like the New Towns and mass housing,

Manplan demanded a change in objectives one more time counting the numerous disasters that tainted the twentieth century:

> What is wanted now is a new image for the twentieth century in its third phase, which will unearth from beneath the lumber of war, napalm, famine, genocide, concentration camps, conveyor belts, population explosions, sonic booms and silent springs, a mission--and a determination--*to swing the new potential of technology as revealed in the moon probes, behind the real objectives of human society. The British are bad technocrats, good humanisers. Or were once. It could be a role.* (Manplan 2, 1969, p. 244, italics mine)[5]

Manplan was published in the form of visual essays followed by short captions to address the changes in mass media and aimed to strike visual society by the force that brought it into being. Written in the rhetoric of "revolutionary humanism," as AR called it, the first issue aimed to voice "the sense of frustration" that British society suffered. Photographs portrayed British people in a frenzy of production in industrial plants, waiting in boredom in overcrowded public transportation, students revolting, cars overcrowding eighteenth century parks and invading the countryside, high-rise office and housing towers invading London. The editorial introductions, presumably written by Hastings, sounded the critique in "The Unnatural History of Man" that he was revising at this time for "The Alternative Society".

According to Richards, Manplan was coined by Hastings as another catchy neologism to attract AR readership, but what Richards overlooked was that it directly opposed another phrase, Non-plan. Opposing the ideas put forward in "Non-Plan: An Experiment in Freedom," essay written by Reyner Banham, Peter Hall, Paul Barker and Cedric Price in "New Society" in 1969, "Manplan" demanded centralization and comprehensive planning against decentralization and dispersal as a means of planning democracy. According to the editors scientific progress enjoined to consumer culture and ever-expanding economic growth brought a ruthless exploitation of resources as well as destruction of the natural landscape.

"Non-Plan: An Experiment in Freedom" was published six months earlier in the New Society" by Reyner Banham, Peter Hall, Paul Barker and Cedric Price. In the form of a counter-cultural critique Banham and Hall demanded an experiment in planning democracy by lifting planning restrictions and allowing people more freedom of choice, arguing for decentralization and dispersal (Banham, et al.,1969). Manplan was directly opposed to the idea in order to prevent its popularity as a nationwide policy. Instead of "letting planning loose," the editors once more stipulated a comprehensive planning mechanism. Instead of "Non-Plan" they wanted "man to plan."

Although they occupied antithetical poles, both Manplan and "Non-Plan" were reactions against the planning practices that had been employed until the late 1960s. What separated them was their respective ideological support for the uses of technology and for "pop culture." While Non-Plan applauded the freedom of choice that consumer culture brought forward, Manplan was highly skeptical of it. When "Non-Plan" was enthusiastic about decentralization and dispersal, Manplan argued that the whole twentieth century planning experience was a proof of its failure. If Non-plan's favorite cities were Los Angeles and Las Vegas, Manplan's were London, traditional British market towns and Italian hill towns.

The issues starting from the second were thematically organized around communication (referring to transportation

[5] Manplan was published as four consecutive issues starting from September 1969, after which it became bi-monthly until the last issue appeared in September 1970 totaling eight. Peter Davey, in his contribution to the special AR centennial number in 1996, notes that Hastings insisted on the change from the earlier layout of the Review into the form of visual essays. Richards opposed the idea and opted for the publication of special issues as before and to keep the contents of the Review tailored to the existing readership. As Richards had anticipated the Review went into an economical crisis in 1970 as a result of the Manplan series. This opposition seems to have led to the whole renewal of the editorial board between 1971 and 1974 starting with the sack of Richards from the position of executive editor and the departure of Pevsner. Also see Richards's opposition to the campaign in his "Memoirs..." where he declared that he refused to take part (Richards, 1980, pp. 261-3).

networks), industry, education, religion, healthcare and welfare, local government and finally housing. With each issue, Manplan deployed an attack on the bureaucratic mechanisms that organized the above-mentioned fields and the inefficiencies of the democratic consumer society. The editors maintained that the logic of the industrial revolution was no longer applicable and the communications revolution had started. Manplan demanded that politicians exert control on the disruptive effects of transportation and industry on the environment by drawing out a holistic, integrative structure. Transportation, it argued, had to rely extensively on fast rail and canals to dominate over the car and air with airports pushed to coastal areas and linked by fast trains. Arguing that industry had become less pollutant, Manplan reverted to the earlier arguments of Townscape to reintegrate the separated functions of the city. The editors opposed the continuity of the New Towns experience by arguing that industrial concentration proved to be wrong and expensive. In the fourth issue on education Manplan attacked the British public schools system as elitist and creating "a self-perpetuating oligarchy" instead of creating a unified society. In order to produce a society divested of class segregation, schools had to be integrated into the community and designed by user participation. Questioning the elevation of science to the status of religion, AR's romantic bias within this reformist rhetoric took a new turn with Manplan's fifth issue on religion. *AR* advocated that religion was inseparable from human consciousness even if was not one of the historical religions. In the early seventies' world, which was becoming more and more suspicious of the objective truth of science, religion would assume a new unifying role and increase "man's chance of unfolding the ill effects of industrialization." (Manplan 5, 1970) Civilia would follow Manplan as a commentary on urbanism and industrialization in the light of the ideals stated in Manplan.

4. Civilia: A Picturesque New Town on Brownfields

The transference of Hastings's ideals expressed in "The Unnatural History of Man" into architecture and city planning continued until the last campaign of his editorial rein. After withdrawing Manplan due to the decline in sales, Hastings thought that he could affect planning authorities and the people of Britain by promoting an alternative new town that would incorporate the environmental ideals that AR had been preoccupied with in the last twenty five years. If a convincing precedent could be created, it could be followed by others. This alternative town would be called "Civilia" (de Wolfe, 1971).

Although Townscape, Outrage and Counter-Attack—which were the ancestral campaigns of Civilia in the 1950s—had expressed an explicit anti-expertise attitude and attempted to remedy the fallacies of planning by visual and psychological responses, Civilia included a planner's report.[6] The two planners approved Hastings's agendas by stating that the twentieth century planning policies had been threatening city centers. They recommended a "reversal of present, largely unplanned decentralisation trends by injecting new centres strategically placed" to attract sprawl and to rehabilitate existing centers. The "utopian" schemes of early twentieth century had to be abandoned, since it was impossible to create "a definable and controllable "balanced community" that can be accommodated within an architectural unity expressed in the form of a new town" (Ibid, p.27).

The choice of location for Civilia followed environmental concerns and the city was proposed for a site near North Nuneaton on old quarries. The site was found remarkable for the "picturesque visual drama," due to abrupt level changes and the exposed rock surfaces of the quarry, as well as its central location in terms of sprawl. It offered a fantastic opportunity for Hastings to realize his dream: The city would direct technology for the benefit of the environment by healing a scar of brownfields and try to create center of attraction by solving the problems of earlier urban developments. The romantic dream to be at peace with nature entailed its healing as well. Civilia was represented via photomontage images that brought together photographs from Hastings's 1963 book "The Italian Townscape" and of well-known projects from the pages of *AR* such as Moshe Safdie's Habitat, the viewing platforms of the South Bank exhibition and Paul Rudolph's Yale School of Architecture. By employing collage and photomontage Hastings also aimed to point to the fact that the modern citizen could easily come up with his or her dream of a city.

[6] The planners are listed as Rodney Carran (DipTP, AMTPI) and Michael Rowley (AADip, ARIBA).

While Civilia, like *AR*'s other campaigns, owed its power to the visual content that accompanied its provocative texts, this visual language also proved to be its ultimate weakness. Although the texts hypothesized that it was well beyond possible, it still did not have a plan, an analysis of material necessities, the types of industries it could support or the specific urban problems it would create a solution for, other than the existing sprawl. Its final image implied a total control of form contradicting its first principle, user participation. It was a romantic utopia with an anti-utopian aim, but it ended up being not less "authoritarian" than the Ville Radieuse of Le Corbusier, which Hastings attacked since the inception of Townscape in 1949.

Conclusion: The Neo-Romantic Compromise: Ecology

The resistance of *AR*'s editorial policies to decentralization and its aim to keep the city compact and dense obeyed the ethical imperative to preserve the resources that fed the city from the very moment of Townscape's inception in the late 1940s. Preserving these resources meant preserving the livelihood of those who cultivated these resources, as well as the landscape as a means of rehabilitation for the citizens. While Hastings aimed to translate the values of the 18th century gentry into the 20th century, he also transformed this figure into a warrior of ecology. "Culture in resistance" was directed to environmentalist action. The economic downturn in Britain in the late 1960s as well as the student riots convinced Hastings that he should question British society via Manplan. Civilia, aimed to portray the possibility of an urban utopia that started with the need to cure the environmental defects created by the post-war planning experience, and to present *AR*'s final answer to the New Towns.

After Hastings disbanded the editorial board and became editorial administrator over a larger body of younger editors in 1971, he wanted to reformulate *AR*'s environmental emphasis. Among Hastings's documents are memoranda to the board which show that he aimed to start a series of articles to take the January 1972 issue of *The Ecologist*—subtitled "A Blueprint for Survival"—as a springboard. A pioneering document of the environmental movement, the campaign that the Ecologist started with "A Blueprint for Survival" created the foundation of the Green Party in Britain.(Pearce, 2000) Pointing to the "gravity of the global situation" *The Ecologist* demanded "a new philosophy of life and a precise and comprehensive programme" for creating the society that could implement this philosophy. (A Blueprint for Survival, p.1) Hastings's prophecy of doom in "The Unnatural History of Man" (1958) was vindicated in 1971 by the support of a large group of scientists that signed *The Ecologist*'s manifesto.[7] Under the protective umbrella of environmentalism, neo-romanticism made its peace with science.

Hastings also aimed to get in contact with the leaders of the environmentalist movement such as Max Nicholson (1904-2003) and Bob Boote, founders and administrators of institutions such as the World Wildlife Foundation and British Nature Conservancy. Nicholson had already written articles for AR during the 1960s that aimed to ally scientific research, the use of technology, natural conservation and planning. The existence of this document and *the Ecologist* within Hastings's papers indicate that Hastings's project to align *AR*'s editorial policies with the concerns of global ecology and green politics remained incomplete after he retired. To overcome the apocalyptic vision of industrialization and economic growth, Hastings had recognized that *AR*'s cultural program had to articulate a new role for science and technology within a global framework. However it was time for him to turn this project over to the younger generation of editors that he put in charge.

[7] The manifesto's opening lines stated: "The principal defect of the industrial way of life with its ethos of expansion is not sustainable. Its termination within the lifetime of someone born today is inevitable—unless it continues to be sustained for a while longer by an entrenched minority at the cost of imposing great suffering on the rest of mankind. We can be certain however that sooner or later it will end... either against our will, in a succession of famines, epidemics, social crises and wars; or because we want it to—because we wish to create a society which will not impose hardship and cruelty upon our children—in a succession of thoughtful, humane and measured changes." (A Blueprint..., 1972, p. 2).

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LIBERTY VERSUS SAFETY: A DESIGN REVIEW

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Abstract

It is our contention that when designing against terrorism, it is important to fully understand both terrorist perpetrator techniques and terrorism prevention principles and to establish the myths and realities about 'fear of terrorism', before catalyzing new design innovations. This paper assesses the requirement for designers to mediate issues of user liberty versus security. We assess the troublesome design tradeoffs between accommodation of users and exclusion of terrorist misuse and abuse linked to bicycle parking, using the Conjunction of Terrorism Opportunity framework. We include the case study of the Biceberg automated bike parking system in relation to the fitness for purpose versus resistance to terrorism debate.

Introduction:

When working on the design of secure street parking, our research revealed that 'fly parked' bikes are regularly removed by the police from locations thought to be high-risk terrorist targets. 'Fly parking' needs further definition and is coined by Adam Thorpe of Bikeoff to describe the securing of bicycles to street furniture not intended for that purpose, i.e. railings, lamp-posts, parking meters, benches, street signs and so on (Gamman et al. 2004). It demarcates the user desires of cyclists as regards parking provision in a similar fashion to the way desire lines (footpaths worn in grass by people avoiding the prescribed routes and taking shortcuts) demarcate the way people wish to move through their environment. Fly parking is a consequence of user demand for proximity to destination and often should be viewed not as 'nuisance' behaviour by cyclists, but connected to lack of adequate provision by the authorities.

Our research has revealed that since the Bognor and Brighton bike bombs, fly parked and other bikes are regularly removed by police in Westminster, London from locations thought to be attractive to terrorist acts. For example, bikes were banned from Parliament Square (London, June 2006), removed and regularly impounded when parked in the proximity of the Labour Party conference in Brighton September 2005:

> Bicycles are being removed to avoid a repeat of the IRA bike bomb blast in Bognor on August 13, 1994. A bomb hidden in a bag on a bicycle chained to railings in the town centre detonated, causing damage to shops but no injuries. Police found another bike chained up near the Palace Pier in Brighton with 5lbs of Semtex hidden in a saddlebag but carried out a controlled explosion before it could go off. If it had detonated it would have killed anybody within a 46 metre radius. Over the next few weeks bicycles left chained up near the Brighton Centre could be removed and taken to a police pound. During the conference, police will aim to stop cyclists before they have time to chain their machines to the fences. Sergeant Pete Hutin said: 'We have removed quite a lot of bikes over the last year and it has been a challenge reuniting them with their owners.' There is no defined zone where bikes are not allowed but those with saddle bags or panniers parked near the conference centre are certain to be

investigated by the police and could be removed (The Argus 2005).

This policing strategy is not an over reaction. Bike parking sites are attractive to terrorists. This is not a fictional assessment or our personal assertion. "It was a remote controlled bike bomb on the roadside which targeted a Ministry of Interior police bus " (Kabul, October 11, 2006). There are many similar press reports about bike bombs that can be easily accessed via the web, which also offers access to a 3 min video clip of the streetscape outside of Yishun MRT train station, Singapore, seen through the eyes of a terrorist. It features the voice of Hashim bin Abas. Bin Abas reviews bike parking from the point of view of someone looking for a place to plant a bomb. The videotape was recovered from Afghanistan and led to his arrest for hostile reconnaissance/terrorist activities. On this tape (transcript is available on Channel News Asia website (Channel News Asia 2007) Bin Abas says:

'You will notice that some of the boxes placed on the motorcycles, these are the same type of boxes that we intend to use.'

The camera pans across the bicycle stands to motorcycle racks and other parking facilities and the voice continues: 'This is a taxi stand, our bicycle can be parked there also; either bicycle or motorcycle. This is a view of the pickup point from the rear, there is a tree next to the bicycle bay, this is the place where the military personnel will alight from the bus or queue up for the bus.' The use of bike bombs is a known urban terrorist MO. In recent years, linked to conflict and insurgency in the Middle East, there are many examples where bike bombs have been used to kill soldiers as well as civilians and create terror in Afghanistan (Command Post 2007, Scotsman 2007, Deutsche Welle 2007), Pakistan (Dawn 2006, China Daily 2007) and more recently Baghdad (Peoples Daily Online 2007). We include press reports in the endnotes for further analysis. Clearly, the policing strategy in relation to cycle parking on London's streets is intended to address, via social policy, what Roach et al. (2005) in their account of the conjunction of terrorist opportunity (CTO), locate as crucial principles to avoid terrorism i.e. 'restricting the resources available to the terrorist; excluding terrorists from the situation; and promoting 'deterrence' via situational interventions deployed to 'raise the perceived risk of getting caught or failure for terrorists.'

In relation to cycle usage in cities 'troublesome tradeoffs' (Ekblom 2005) between designing to promote the benefits of cycle usage and designing to reduce the threat of terrorism are glaringly apparent.

We note that: 'It is estimated that up to 1,600 people can die prematurely each year due to health problems caused by breathing London's polluted air.' (Mayor of London 2002). So it may be argued that the risk associated with bike bombs is superseded by that of traffic pollution. Additionally, the pollution threat is discriminate in that it directly affects the most vulnerable, 'children, older people and those with heart and lung problems.'

It is already established that 'most [air] pollution in London comes from road traffic', the major contributor being the '11 million car journeys made [in London] every day'. The Mayor of London's Air Quality Strategy (2002) identifies increased cycle usage as part of the solution to this lethal problem. He advocates measures aimed 'to help staff to walk, cycle or use public transport to get to work; for example by putting in cycle racks and showers'.

Desirable as it is to eradicate the threat of bike bombs from our cities, deterring cycling by banning cycle parking in busy locations (considered high risk) cannot be the answer given the benefits of cycling in relation to health and quality of life issue. The issue of 'risk', discussed at length by Durodié (2005) needs to be carefully understood and reviewed. Indeed, if the benefits of bike use are more significant for daily commuters than the threat of terrorism how far should anti terrorist thinking influence or impede the design, context and availability of bicycle parking?

We believe the above question is the crux regarding the design of anti terrorist objects/ environments for public space. To address the tradeoffs that inevitably arise, we advocate a rigorous assessment of the design conflicts and confluences between security and user requirements.

Liberty versus Security – Assessment of Conflicts and Confluences of Cycle Parking User Requirements and Terrorist Misuse.

1. In the Security Corner...

When considering Roach et al's Conjunction of Terrorist Opportunity Framework (2005) in relation to public cycle parking, seven of the principles are particularly useful for identifying areas of conflict between user requirements and measures necessary to deter or prevent terrorism.

A definition of terms, abbreviated from Roach et al.'s (2005) original text is necessary to appreciate how these principles relate to situational terrorism prevention through design:

1.1. Excluding terrorists from the situation
'Excluding suspects from places within a country ... (e.g. injunctions to stop suspected animal rights activists from going near the homes of pharmaceutical company employees)' may be an appropriate consideration in relation to cycle parking. Those individuals considered to be high risk being denied access to sites considered high risk.'

1.2. Deterrence
'Raises the perceived risk of getting caught or failure for terrorists; discouragement makes the terrorist think that the effort to commit the act is too great for the reward.
On the situational side are a range of familiar techniques to: increase the effort for the terrorist, increase the risk, reduce the reward, reduce provocations, remove excuses and enhance empathy.'

1.3. Target vectors
Target vectors are the immediate targets of terrorist action. Terrorist engagement with the target vector is a means to an end. The action on the target vector is not the end in itself but the mechanism by which to deliver a message to a broader audience.

'Interventions that prevent people and things becoming target vectors will be largely situational.' For example, 'The use of the twin towers in New York by Al Quaeda as a target vehicle (and the concern about nuclear power-plants becoming targets) has led to the introduction of many situational prevention measures' such as 'Construction of buildings that are not head and shoulders above the rest' Ekblom notes: ' But there is again a trade-off between being prudent versus giving some kind of surrender message to target audience and the enemy.' Consideration of the bicycle in an urban context as a target vector is appropriate as the banning of bicycles from public spaces, due to the threat of terrorist misuse, may deliver the message that the benefits of bicycle usage are denied those who are in conflict with terrorists. It is important to consider the range of situational prevention measures that may prevent bicycles becoming target vectors. It is also important to be wary of the possibility that a ban on parked bicycles in high risk areas may send a surrender message.

1.4. Target enclosure
'Well-established techniques such as target hardening and access control used to modify situations to prevent crime are applicable to preventing acts of terrorism. Multi-layered target enclosures and associated access control (the onion skin approach) can confer defence in depth.'

1.5. The wider environment
'Changes which make the environment less attractive, less likely to generate offending or less logistically/tactically favourable for offenders.' Interventions may be local in focus and may involve changes in the design and management of facilities and locations. 'Areas containing specific national icons may attract terrorist attention; so may require broad protection via surveillance, redesign of road layouts, access points etc.'

1.6. Boosting preventers (including capable guardians)
Preventers are people who may make terrorism less likely to occur or make it harder for a terrorist to succeed.

'This can be through formal control (e.g. increased security patrolling, surveillance, intelligence-gathering and investigation, and the acquisition/placement of informants [site managers, guardians of targets]) or informal social control (e.g. increased employee and public vigilance).'

1.7. Discouraging or deterring terrorist promoters
Promoters are people who may make terrorism more likely to

occur or make it easier for a terrorist to succeed. Promoters can be considered to be deliberate or careless.

In relation to bicycle parking an address to careless promoters is appropriate. 'Measures against careless promoters can include anything from reminding people to lock doors or take their bags when leaving trains...[or parked bikes]'

2. In the User Corner...

When considering the design of cycle parking provision, there are a number of key design drivers that prescribe 'fitness for purpose'. Design of an appropriate facility, likely to meet user requirements, and therefore encourage optimum usage, must consider the following issues that we have extrapolated from existing cycle parking design guidelines and Bikeoff research.

2.1. Length of stay
Short stay (<2 hours), medium stay (2-6 hours), long stay (6+ hours). Short stay should be located within 25 metres of the destination it is to serve. Longer stay requires greater security from theft and can be located up to 50 metres from the destination it is to serve.

2.2. Location
Should reflect user desires. Fly parking is a good indicator of demand.
For cycle parking to be attractive to users it should be located 25-50 metres from the destination it is to serve.

2.3. Layout
Sites serving multiple destinations should be provided parking in small clusters of stands (<6). Sites serving single larger destinations should be placed together in adequate numbers. Layout should consider sight lines to facilitate easy monitoring of stands.

2.4. Spacing
Should allow easy use of parking and circulation of users.

2.5. Access
Should be easy for cyclists on and off their bikes and avoid conflicts with other users of the space and its approaches. Long stay parking or site-specific parking (e.g. workplace) may consider controlled access.

2.6. Guardianship, Surveillance and Lighting
Parking should be well lit such that monitoring and use is facilitated. Those personnel monitoring the surveillance and those providing guardianship should be informed and empowered as to potential threats to the security of the facility and its users. Such measures should consider the approaches to the parking as well as parking itself.

2.7. Maintenance and servicing equipment should be low maintenance. Servicing is necessary to signal a secure, well-managed facility and is likely to be attractive to users.

2.8. Signage
Should be clear and instructive to all languages and should inform users as to the most appropriate usage of the facility.

2.9. Charges are only appropriate on long stay parking where security is highly considered.

2.10. Scales of Provision. Scale should reflect demand and allow for expansion. Fly parking is a good indicator of demand.

Once user requirements and CTO principles are defined their cross consideration may assist designers in identifying the areas of conflict between 'fitness for purpose' and resistance to terrorist misuse or abuse.

A table illustrating cross comparison of these CTO principles and cycle parking design requirements is featured at the end of the article (Figure 8). It assists the designer in identifying the troublesome tradeoffs and convenient correlations between user requirements and the techniques that deter terrorism. Having determined these conjunctions, knowledge of terrorist MOs is required to enable the designer to understand how to mediate, reducing conflicts and amplifying confluences.

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[1] See: http://www.bpsa.info/intro.htm, http://www.camcycle.org.uk/resources/cycleparking/standards/city.html among many others from local councils (and downloadable from TfL and SRA)

3. Summary of Conflicts and Confluences

A summary of these conflicts and confluences, within design of cycle parking, can be stated as follows:

3.1. *Length of stay* is a high conflict consideration as cyclists require the option to leave their bikes parked, and unattended, for whatever length of time they desire. This pattern of usage provides cover for terrorists as it legitimises the presence of unattended bikes. One confluence is that users of 'long stay' parking require greater security, including controlled access, surveillance and guardianship. Thus long stay facilities provide good opportunities to design "against terrorism" without user conflict.

3.2. *Location* is a high conflict consideration. Research shows that for short stay cycle parking to be used it should be located within 25m of the destination served and 50m for long stay parking (Sustrans 2004). The lethal blast radius of 5lb of Semtex (as hidden within a saddle bag in Brighton in 1994) is 46 meters. Thus, the user requirement for parking to be close to the destination it serves is **problematic**, especially at iconic sites that may attract terrorist attention.

By reviewing the above standards, we clearly identify that it is undesirable to users and sustainable transport objectives for the authorities to adopt a strategy that involves removal of bikes from the location (as in Westminster, London), and creates 'exclusion zones' for cyclists.[2] A thorough analysis of terrorist MOs, in pursuit of mediation of this conflict, is necessary, and in our opinion, reveals that in the vast majority of cases, explosives are NOT concealed in the bike itself but in bags placed on the bikes, and we include numerous press accounts in our endnotes in support of this assertion (Davenport 2006, Dawn 2006, Scotsman 2007). Therefore, it may be appropriate, in cases where 'short stay' parking is desirable, to address risks of terrorism by removing **bags on bikes** (rather than bikes) from the high risk locations.

Proximity to destination the bicycle parking serves does offer some anti-terrorism benefits in that it may *boost preventers* by appropriating guardianship from personnel at the destination served. It is necessary for these guardians to be alerted, motivated, and empowered to be effective. Again 'long stay' facilities are most compatible with anti-terrorist considerations as these facilities acknowledge a user requirement for guardianship.

3.3. *Layout* can easily be modified to benefit users and deter terrorist misuse and abuse by offering improved sight lines that deter concealment (of terrorist surveying opportunity, planting bomb, and bomb itself) and facilitate surveillance. Also by ensuring access for security equipment (bomb disposal) should the need arise.

3.4. Spacing
Similar concerns to layout are apparent; spacing can readily accommodate anti-terrorist considerations.

3.5. Access
'Short stay' and smaller facilities generally allow and require free and easy access that is problematic from security perspectives. Long stay facilities may warrant greater investment in access security and may readily accommodate controlled, surveyed and recorded access of benefit to both the security of users and their bikes and terrorism prevention.

3.6. *Guardianship/ surveillance/ lighting* is a factor of high confluence with terrorism prevention. Appropriate training and education of guardians will provide formal preventers. Deployment of appropriate technology (sniffers/ digital recognition/ Video Content Analysis) will aid formal preventers.

3.7. *Maintenance* of a facility and its security systems signals quality of management and surveillance. A well-managed facility will deter terrorists and attract users. Clean facilities, clear of obstruction, whilst of benefit to users, may also remove possible concealment for bags or bombs left unattended.

3.8. *Signage* offers a great opportunity for terrorism prevention by recruiting informal preventers amongst users and the public via messaging such as: 'Please report any bags left on bikes.' Also by instructing legitimate users to avoid usage that may provide 'cover' for terrorist MOs

[2] See: http://www.westminster.gov.uk.

i.e. messaging such as 'Do not leave any bags, panniers or containers on your bike'.

3.9. *Charges* benefit prevention of terrorism as payment facilities often require some form of registration and access control. Charges usually denote greater security. Payment for usage may also finance security interventions.

3.10. Scale
Whilst there is a minimal risk that large-scale facilities may become targets for terrorism, it is also true that larger facilities allow for centralisation of resources and justify implementation of the measures listed above.

In brief, after analysing the above user requirements and CTO principles it is our view that an appropriate anti-terrorist bike parking facility may be described as;

i) Large scale with convenient and controlled access (possibly with a fee charged),
ii) Well managed, lit and maintained; and
iii) Regularly surveyed by appropriate informed and empowered guardians,
iv) The design of the site should facilitate good surveillance (sight lines) and deny opportunities for concealment,
v) Ideally, the parking should be situated within a robust enclosure (to contain an explosion should the worst happen),
vi) Layout and spacing should facilitate easy observation and access for security equipment as well as users,
vii) Signage should communicate with users as to appropriate usage i.e. 'no bags to be left on bikes', 'please report any bags left on bikes',
viii) Long-term facilities can readily accommodate these requirements. Short-term facilities will find it harder to implement these measures but in high risk areas should consider the principles above and apply them where possible,
ix) All facilities should prohibit bags or other containers being left unattended on bikes in parking facilities.

Having identified where the conflicts lay, an understanding of terrorist MOs (perpetrator techniques) may enable designers to mediate these conflicts within their proposals. And thus we would argue one of the best means of equipping designers to design against terrorism would be to make sure these perpetrator techniques are documented and understood, Paul Ekblom has argued (in conversation with us) for much more in depth analysis of criminal perpetrator techniques and scripts, and we would make the same case regarding terrorist MOs.[3]

Also other questions need to be addressed. Why would the terrorist, of all the objects in the urban environment to choose from, select a bike as their bomb carrier? Is the bike park close to a high risk target? Is a bike the only thing that can get close to the target and be left unattended? Are other potential carriers subjected to searches or authorisation? It is appropriate to ask these questions first as it may be that the need for an address to terrorism at all is unnecessary, given risk analysis of context, or that the context warrants even greater consideration of terrorism deterrence.

In relation to the Westminster parked bike parking ban described earlier, a review of terrorist MOs related to bike bombs, reveals that the majority of bicycle bombs are located within bags on bikes rather than in the bike frames themselves. In fact we have been unable to identify bike bombs integrated into the bike frame, with the exception of N. Ireland in the 1970s (Bowden 1976). There is not sufficient information on record to detail the impact of this MO. We do know however that all other terrorist interventions using 'bike bombs' have located the explosive device within a bag or other container on the bike. This is significant. It indicates the bike frame does not offer easy accommodation of terrorist intentions. This is significant in terms of policy about bike parking. It prescribes an intermediate action between removing bikes from the scenario, at a cost to quality of life issues (including convenience, environment and health) and that of no-response to the potential terrorist risk presented by parked bicycles and their accessories.

Clearly we should not be complacent about the risks of terrorists using bombs integrated into bikes in public places. We are well aware that terrorists are what Ekblom (1997) describes as 'adaptive criminals' so that 'displacement' of the

[3] AHRC Bikeoff 2 project meeting between Design Against Crime Research Centre and Jill Dando Institute of Crime Science, 24th January 2007.

terrorist bomb from bag to bike frame may occur in a short space of time.

We would advocate that knowledge of terrorist MOs be continually re-appraised to empower designers to keep up with the 'adaptive' terrorist. Indeed, where possible designers and their expert advisors should seek to outmanoeuvre the terrorist threat by designing against risk prior to its occurrence (in this instance perhaps via the design or urban bicycles or cycle lockers that would contain a blast). However, we must be wary to avoid 'scientific and technical [or design] developments where we increasingly elevate risk over opportunity' (Durodie 2002) at a cost to quality of life and user freedoms. Designers and cycle parking providers should avoid what Durodie (2002) describes as 'vulnerability-led' responses. These tend to focus more on speculative 'What if' type questions - particularly emphasizing low incidence/high consequence scenarios... at the expense of realistic 'What will?' and 'What has?' type evidence.

We also tend to agree with Hille Koskela's (2002) who in her account of 'tolerance versus prejudice' states 'it is sometimes worth taking a risk in relation to security when considered against quality of life issues given that 'hard solutions' faint [fade?] over time.'

Preventing cyclists from parking easily by applying bicycle exclusion zones, or bike parking restrictions, is also not the only troublesome tradeoff we need to think through regarding anti terrorist design strategies. Cycling has recently become a 'hot' political topic, not least because of the success of sustainable transport discourses. There are more cyclists on the road in London resulting from measures such as congestion charging, and some argue because of the bombing of the London Underground on 7 July 2006, which catalysed a 400% increase in cycle sales in the capital in the weeks that followed.[4]

The relationship of the bike to such discourse has been 'heightened' or to use Innes (2004) account has been 'signalled' and therefore could easily become a symbolic terrorist target. When considering why a bicycle would become a terrorist vector situational considerations may not be the only motivating factors. The potential to embarrass the authorities and scupper their attempts at developing more sustainable transport options needs to be considered too. Perhaps the ultimate troublesome tradeoff is between the negative impact upon 'on street' cycle parking provision that would inevitably ensue should a terrorist using a bike bomb 'succeed' occur and the measures necessary to prevent this occurrence. A terrorist success in using a bike bomb may lead to over-reaction by the authorities and circumvention of the requirement for cycle parking to be freely and readily available to users to promote urban cycling whilst over determination of measures to prevent this scenario may themselves deter cycle usage.

2. Biceberg – A Cycle Parking Case Study

To consider these troublesome tradeoffs in practice we offer a review of 'Biceberg' an innovative urban cycle parking solution, designed and used in Spain.

The Biceberg[5] underground parking system is automated. It collects bikes from, and returns them to street level (Figure 1).

[4] In conversation with Andrea Casalotti, proprietor of Velorution, 2005.

[5] The account herein of Biceberg is based on information supplied and drawn up by Gamman and Willcocks for Reinventing the Bike Shed exhibition, London 2006. Full details about Biceberg feature exhibition included:
Name of company: MA-Sistemas, S.L. Crtra.Nacional 330 km 647,500 Poligono Charlé-Calle 222700 Jaca -Huesca-SpainTel. + 34 974 357 07 Fax. + 34 974 357 074; Name of Architect/designer: Jaime Palacios;
Supplier of parking equipment/ furniture: MA-sistemas, s.lL;
Type of parking equipment/ furniture (e.g. Sheffield stand or Double parker): eAutomatic underground bike park;
Location of installation(s) and facility/amenity it serves: Town centres, Transport interchanges, stations, University campuses, sports/ leisure centres etc;
Cost (of installation/build - not use): 46 bikes - €120,000 euros, 69 bikes - €135,000 euros, 92 bikes - €150,000 euros (based on costs installed in Spain);
Number of bikes stored: 23, 46, 69 or 92 per unit (i.e.- each level of underground storage takes 23 bikes - like a carrousel);
Length of stay the facility seeks to serve: short – medium - long term (most common use is medium – 1-8 hours) but overnight stay is possible;
Service period (how long the facility is meant to last): approx. 25 years (with preventative and software update maintenance).

It comes in different model sizes able to store 46 bikes, 69 bikes or 92 bikes. In addition to bike storage, the space provided for the bike by the Biceberg can also be used to store accessories such as a helmet, backpack or even a laptop (Figure 2).

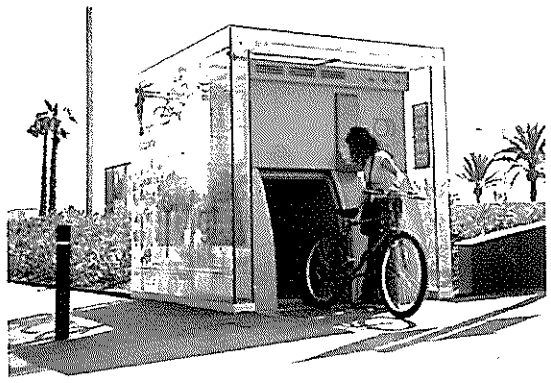


Figure 1. © Biceberg

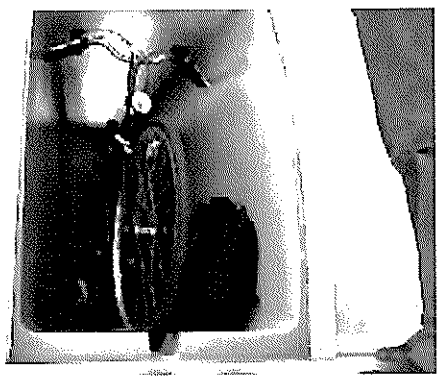


Figure 2. © Biceberg

When we asked a number of police officers to review the system for London (we featured a model of it at the **Reinventing the Bikeshed** exhibition[6] during the London Architectural Biennale, we were surprised that all those officers who spoke with us mentioned their concerns about possible terrorist abuse.[7]

The Biceberg system was first conceived in 1994 by Jaime Palacios and his company MA-Sistemas, S.L. It was further developed in 2003 to an operational standard, and has now been installed in six locations in Spain (Figure 3). In 2006, we understand from the designer, there were several expressions of interest in using the system from other European countries, including France and Denmark.

The exterior housing for the automated system, shown below, is located at ground level.



Figure 3. © Biceberg

The see-through 'casing' has been designed using laminated toughened glass to maintain transparency. Much thought has gone into the design of the machine in regard to technological ease of use, aesthetics and information design in relation to providing a user-friendly experience. The first point where the cyclist interacts with the machine, is consequently easy on to the eye as well as to the user (Figure 4).

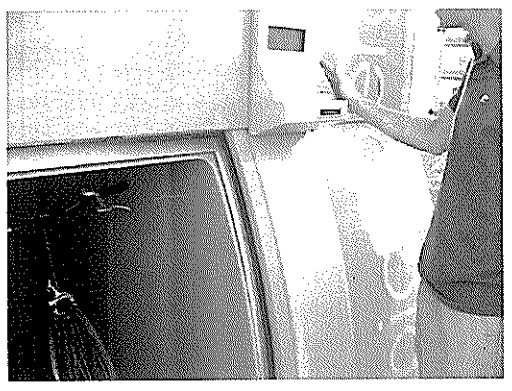


Figure 4. © Marcus Willcocks

[6] See: www.reinventingthebikeshed.com

[7] With thanks to many officers including Brian Howat, of British Transport Police Terry Cocks and Ike Gray of the Metropolitan Police, Camden.

It provides easy-to-understand messaging when users interact with the computer screen to access the bike storage. User-centred detailing such as the groove in which to stand the cycle, next to the machine before loading is clearly thought through and again easy to use (Figure 5).

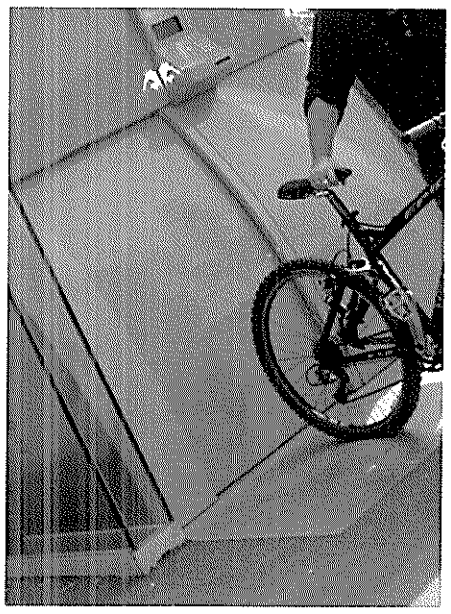


Figure 5. © Marcus Willcocks

The system works by storing bikes in individual underground container segments, (like slices of a circular cake) forming carousels. The different model sizes (46, 69 and 92 bikes), are attained via deployment of a modular system which comes in carousel stacks of 23 bikes per level, as can be seen from the images below taken inside the store area (Figures 6a and 6b).

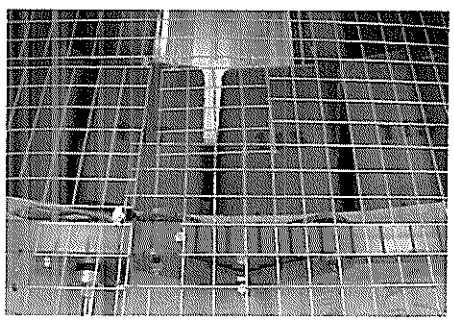


Figure 6. a © Marcus Willcocks

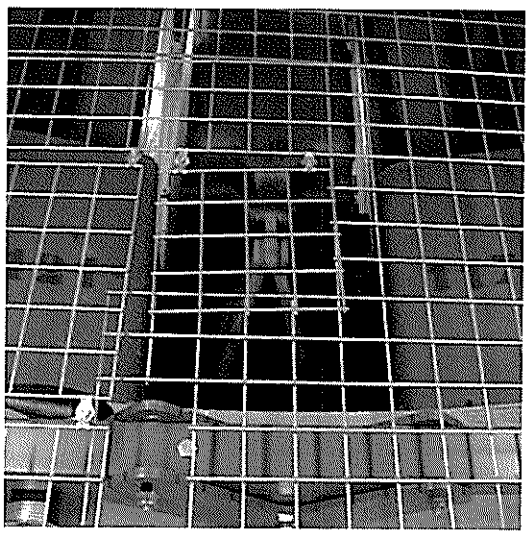


Figure 6. b © Marcus Willcocks

The user carries out these operations using a chipped smartcard and enters a secret personal code, in a process comparable to using an ATM (Figure 7).



Figure 7. © Biceberg

Waiting time and interface are also similar to that of an ATM. It is estimated that loading or accessing a bike for storage or retrieval takes 25 to 30 seconds. First time users will need a little longer to get used to the system. The 'smart cards' are the key to accessing the facility and retain details about the user on a central database that monitors patterns of use. Six cameras, built-in to the installation, monitor what is introduced to and retrieved from the storage units. The video

cameras are activated specifically when someone inserts or removes objects via the system. Upon loading the bike into the machine the contents are also weighed, to further confirm what has been entered or removed (to check it conforms to usual bike weights) and to prevent, for example, a child or a person (drunk 'stag night' attendee for instance) being inappropriately loaded into the bike park. The system also currently integrates equipment for the detection of any living beings or species introduced - this works via a combination of infrared and microwave technologies.

The key strengths of the system, from a user perspective, include the fact that Biceberg offers space sensitive underground parking that can contain extra mobile objects (helmets, bags) as well as bikes. Also, on street, the housing offers exhibition or advertising potential for the promotion of cycling. Its SmartCard and Pass-Code controlled access system means that users have exclusive access to their own property and that it is relatively safe from theft at any the of day or night.

Concerns in relation to fitness for purpose are limited to the fee paying aspect and multi-user access at times and locations of peak usage. Installation of several smaller (46 bikes) as opposed to one larger (96 bikes) facility would go some way to resolving this issue.

Despite this positive user review security experts to whom we showed the Biceberg system, prioritised concerns about bombs being planted by terrorists in bags or on bikes, who were imagined to be able to gain access by stealing smart cards or obtaining them in false names. We identified from the start that the design of the underground concrete bunker, which forms part of the pre-fabricated structure, in which bike are stored could protect the public from the worst of any potential bomb blast at street level linked to terrorist activity, but this fact did not alleviate their concerns.

When we raised these issues with the owner/ designer James Palacious, his first response (when interviewed by Marcus Willcocks in Barcelona 2006) was to say that adding explosive detecting sensors wasn't impossible in design terms, just entirely 'unnecessary.' He argued that the system already had enough 'defensiveness 'designed into it via password protected, smart card access control systems, and CCTV, to be safe. 'Yes' the system could be adapted further to include explosive detection, but the owner thought it pointless unless ordered by direct customer specification. Also the extra costs of this added security could, in his opinion, be prohibitive for the majority of customers.

When viewed in relation to the design recommendations identified in the above cross comparison of user requirements and CTO principles, the Biceberg appears to us to be a highly appropriate solution for cycle parking in certain areas, currently considered to be at high risk of terrorism. We can see that it would work well in certain contexts, (if not all) even in cities like London that are regularly on high security alert, with one provision. When considering Biceberg in relation to its robustness to terrorist misuse or abuse, the feature which the manufacturer considers to be one of its key user benefits, is in our opinion, one of its greatest weakness, i.e. the ability and encouragement to store bags as well as bikes. The above analysis prescribes that storage of the bags or other items capable of concealing explosives must be denied. This is a serious claim, and means that in using a strong theoretical framework, the CTO framework, to create an informed opinion about a design, we can balance the opinions derived from expert review, and identify that the real issue linked to terrorist misuse or abuse, and use is counter intuitive. Rather than Biceberg being a likely terrorist facilitator it could in fact be a good cycle parking solution in high risk areas.

Conclusion

Cycling is good, bombs are bad. And bombs in bags on bikes are more common than bombs integrated into bike frames (so far...). In the context of fears about bike bombs, we should not negate the opportunities for increased cycle usage via restriction of provision of on street cycle parking, for fear of creating opportunities for terrorist misuse and abuse. However, as the threat of bike bombs is not entirely delusional we must, where possible, design against them in an appropriate and proportionate manner. To do this requires the designer to i) identify areas of design conflict and confluence between liberty and security (i.e. sites of conflict/confluence between use and misuse/abuse), ii) where conflict or confluence exists an address to both user freedom and exclusion of terrorism

is appropriate. iii) At such conjunctions it is essential that the designer mediates between security and liberty, accessing sufficient knowledge and metrology by which to consider levels of risk and thus action appropriate and proportionate response. At all times, designs for exclusion of terrorism should be covert and clandestine so as to avoid promoting fear of terror through their design language; to avoid the design itself becoming what Innes (2004) would refer to as a 'crime [or terrorist] signal' or Roach et al. (2005) describe as a *'vector'*.

Ultimately, we agree with Frank Furedi (2002) who argues against a 'culture of fear', and also Bill Durodié (2002) who warns against over-reaction from the authorities, and states the need to develop responses based on clear values rather than focussing on vulnerabilities.

To paraphrase Durodié: 'To restore some balance [within the user liberty versus security debate] demands acting calmly [or designing calmly] confidently, and above all rationally.'

If we are to benefit from design opportunities, spanning troublesome tradeoffs between security and user requirements with ingenuity, rather than suffering the consequences of 'vulnerability-led' responses, designers must embrace what John Thackara (2005) has described as 'design mindfulness'. We must also heed Benjamin Franklin's warning that 'Those who would give up Essential Liberty to purchase a little Temporary Safety, deserve neither Liberty nor Safety.'[8]

Acknowledgements

Adam Thorpe and Lorraine Gamman would very much like to thank the Arts and Humanities Research Council/ EPSRC Designing for the 21st Century Initiative for funding of the 'Bike Off 2 – Catalysing anti theft bike, bike parking and information design for the 21st century' that enabled research for this paper to happen (and travel costs to give presentations at EAD conference).

Also to our colleagues, Prof Paul Ekblom and Marcus Willcocks at the DAC Research Centre, and Dr. Shane Johnson, Aiden Sidebottom and Prof. Ken Pease of the Jill Dando Institute of Crime Science for their critical comments. Also Paul Donlevy of Metropolitan Police, Westminster and Ike Gray of Metropolitan Police, Olympics for sharing their knowledge of this field.

[8] Those who would give up Essential Liberty to purchase a little Temporary Safety deserve neither Liberty nor Safety', is an often misquoted phrase commonly attributed to Benjamin Franklin. The quote is taken from, 'An Historical Review of the Constitution and Government of Pennsylvania,' first published anonymously in London in 1759. The quote is an excerpt from a letter written in 1755 from the Assembly to the Governor of Pennsylvania. Benjamin Franklin did publish the edition printed in Philadelphia in 1812, and most likely the original, but denies writing any part of it. The quote, however, may have originated from Franklin and been excerpted for the book by the author. (Wikipedia 2007)

Figure 8. Cross comparison of CTO principles and cycle parking design requirements

Key: - = conflict + = confluence 0 = no relation

	Exclusion	Deterrence	Vectors	Enclosure	Environment	Preventers	Promoters
Length of stay	-	-	-	-/+	-	0	-
	Cannot limit presence	Legitimises presence of unattended object	A bike is generally innocuous a symbol of free to stay where it likes as long as it likes.	Short stay/ easy use doesn't allow for enclosure. Long stay can require enclosure and access control	Legitimises presence of unattended object for period of time		Short stay users are less likely to remove bags and containers thus becoming *careless promoters*
Location	-	-	-	+	-	+	0
	<25m means	Proximity to target could increase rewards	Bikes can go anywhere as they are perceived to be no threat.	Despite location parking can be physically enclosed to contain blast	High risk due to proximity to destination - particularly at iconic sites that may attract terrorist attention which may warrant special consideration	Proximity to destination served may allow for acquisition of personnel at destination to serve as preventers	
Layout	+	+	0	0	+	+	-
	Enable observation	Enable observation and increase risk of getting caught/being detected			Enable observation and access with bomb disposal equipment	May facilitate preventers by enabling observation	*May conceal careless promoters by concealing their misuse*
Spacing	+	+	0	0	+	+	+
	Enable observation and access for security equipment and personnel	Enable observation and access for security equipment and personnel			Enable observation and access with bomb disposal equipment	May facilitate preventers by enabling observation	*May conceal careless promoters by concealing their misuse*
Access	-/+	-/+	0	-/+	-/+	-/+	0
	Restricted access could limit opportunity for terrorist access	Restricted access could increase risk and effort for terrorist access promotes enclosure		Easy access denotes low enclosure. Restricted/ controlled access less attractive	Easy access attractive to terrorists. Restricted/ controlled	Easy access may inconvenience formal preventers by making it harder to identify legitimate users. Restricted/ recorded access assists formal preventers	

	Exclusion	Deterrence	Vectors	Enclosure	Environment	Preventers	Promoters
Guardianship/ Surveillance/ Lighting	+	+	-	+	+	+	+
	Informed personnel could watch out for terror MOs and record access	Staffed facilities with restricted and recorded access could increase risk and effort for terrorist	Targeting of a secure facility would demonstrate that no bike is safe.	Staffed and surveyed facilities assist in target hardening	Staffed and surveyed facilities will deter terrorists	Capable guardians, motivated, informed and empowered are effective formal preventers. Appropriate lighting and surveillance assists formal preventers.	*Denies clandestine misuse of facility by careless promoters.*
Maintenance	+	+	+	0	+	+	+
	Informed personnel could watch out for terror MOs	Informed personnel could increase risk and effort for terrorist	Successful targeting of a well maintained facility would demonstrate that no bike is safe		Well maintained facility and security features could benefit users and deter terrorists	Well maintained facility will assist formal preventers	*Well maintained facility will deter misuse of facility by careless promoters*
Signage	+	+	0	0	+	+	
	Legitimate users could be requested to take action not associated with terrorist MOs	Signage denying actions associated with terrorist MOs could increase risk and effort for terrorist			Signage denying actions associated with terrorist MOs will deter terrorists	Facilitates formal preventers in identifying deviance. Facilitates informal preventers by requesting vigilance and reporting	*Excellent deterrent to careless promoters by warning against misuse that may provide cover for terrorist MOs*
Charges	+	+	0	+	+	+	0
	For long-term parking. Could be designed to control access	For long-term parking. Could control access and increase risk and effort for terrorist		Charge facilities for long term. Could control access and increase risk and effort for terrorist	Charge facilities for long term. Could control access and deter terrorists also could pay for additional security measures	Charge facilities for long term. Could control and record access aiding formal preventers	
Scale	+/-	-/+	-	+	-/+	-/+	-
	Could enable centralise resources/ may become target due to volume of usage	Could increase provocation due to location and size or could serve to centralise resources	Large scale facility could increase provocation due to extent of potential impact	Large scale allows centralisation of resources which would afford enclosure techniques	Could increase provocation due to location and size or could serve to centralise resources	Small scale is likely to rely on informal preventers. Large scale could centralise resources and facilitate formal preventers	*Large scale parking increases likelihood of careless promoters.*

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FEAR AND KNOWING: DESIGN DISASTERS

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Abstract

This paper discusses the use of fear and the unknown in the practice of communication design, and their merits as a part of design research projects. It reflects upon a participatory poster series to reveal some of the underlying issues for design practice and research. It looks at this "disastrous" design project to investigate the possibility of new knowledge, new learning and greater inclusivity in design practice being facilitated through design failure.

The project was a very small, short timeframe, collaborative project, designed to include audience response directly. The work of the project itself is not necessarily the subject of this paper; it is the impact of that work, on audience, on the authors/designers, on research, and as a means to develop critical design practice.

The paper examines that which we might lose, as designers, if we aim to use established design knowledge to control a projects' outcomes and remove all fear of failure. It posits that by guaranteeing success in this way we can, simultaneously, remove the ability of our work to produce the new and unexpected, and reduce its ability to establish an inclusive community with audience.

1. Introduction

Knowledge is the antidote to fear said Ralph Waldo Emerson.[1] This paper examines his frequently used maxim in relation to the practice of communication design, and a particular communication design project. Using his statement as a starting point this paper asks the question; 'what is it designers fear?' and further to this; 'In finding an antidote to fear, what may designers lose?' The paper makes the proposition that, for some design projects, in certain design situations, we might be better served if we turn Emerson's original statement around to become *Fear is the antidote to knowledge.*

It is proposed that when designing from a position of secure knowing, one is in danger of obviating the opportunity to learn; if we know *what* we know, and we know *that* we know, we are encouraged to act only on the basis of that knowledge. Our secure knowledge defines a pathway for action; it sets up our expectations as designers and allows us to control the responses to the work. In the security of that knowledge we no longer need to question our assumptions; we can proceed forward into the future guilelessly, guiltlessly and confidently. Conversely, if we are to actually find new knowledge, knowledge we don't already know, we may need to allow ourselves to remain a little fearful and proceed forward with a degree of *unknowing.*

This paper discusses the case study of a disastrous project in order to lead the analysis of the above proposition. This particular project presented was a disaster in terms of fulfilling

[1] Woopidoo! quotations - Inspirational Business Quotes; Business Quotes by Ralph Waldo Emerson, Available from: http://www.woopidoo.com/business_quotes/authors/ralph-waldo-emerson.htm [Accessed 20 November 2006]

the designers' intentions. It led from disaster to disorder and thence to discourse. It was through discourse that disorder and disaster came to be revealed as creative forces; forces capable of producing new knowledge and revealing new lines of inquiry.

2. On Emerson and Knowledge

Ralph Waldo Emerson was an often-quoted key writer and thinker in early American literature. One of the most famous remarks attributed to him was the statement *knowledge is the antidote to fear*; like all good aphorisms it seems immediately clear that he speaks with commonsense, wisdom and clarity. The statement gives the common, slightly fearful person, hope that he or she has the ability to banish their fears and move forward with the clear-eyed fearlessness of the knowledgeable.

Emerson was born in 1803 and lived to 1882, a time during which vast advances in knowledge were made. It is not an exaggeration to say that every area of human endeavour was undergoing a revolution by industrialisation. It was felt that everything was possible, one just needed to focus enough energy and enthusiasm and the truth would be revealed. When we read the writings of the time it is as though the world was a giant clock, able to be taken apart and understood in microscopic detail. It appeared that this mechanistic knowledge would provide the irresistible leverage to bridge the widest gap, control plague and banish the irrational fears that had held humanity back.

It is implicit within Emerson's statement that fear itself is a negative; that it is better to be without fear, that we all desire the removal of fear. The technique for that removal, an *antidote* in this case, is *knowledge*. We are assured that through the gaining of knowledge we can remove fear. Antidotes generally remove poison, thus fear is cast in the role of a poison, reducing our capacity to have agency in the world and manifest our will. Knowledge is providing an antidote to that fear, removing it from our bodies and minds and freeing us to take action.

3. Knowledge and Fear

> Designing also produces some new knowing on the part of a designer; there is a moment in the process where something is new to the designer – a new insight, an understanding of how to achieve a desired end, a satisfying arrangement of elements. If remembered or recorded, this moment of knowing starts on the path to becoming collective knowledge. Downton (2003, p.95)

Where does the knowledge come from to which Emerson refers? It is not clear from his statement. Knowledge might come from a number of different avenues; from an established canon; from personal experience in our practice or in our lives; from a mentor or a colleague.

Where does fear come from? We are born with fear; when we are children we often fear the dark, we want the light on, the light allows us to look around our bedroom and be reassured that there is nothing lurking in the corner. The light dispels those shadowy uncertainties and brings clarity and certainty to the situation. The fear is forgotten and we feel safe – safe; comfortable; without danger or risk. It feels good to remove this fear; it allows us to relax and to sleep.

However, it is clear that fear is not always a bad thing. It is a fundamental emotion and acts as a governor, protecting us from being too foolhardy, impulsive or overconfident. Fear of the consequences mediates the actions we take, we become aware of the conditions around us and mindful of "what might happen if". Fear of the social consequences often leads us to think of the other and the events that might unfold if we were to take action without forethought.

Fear can be dispelled through knowledge, there is no doubt about that; fear of the other dissipates when we gain knowledge of that other and come to understand that the other is not so very "other"; fear of falling can be removed by the demonstration of the strength of the support that has been put in place; fear of rejection can be removed by communication, we can come to understand the motivations that cause particular events to unfold rather than allow our imaginations (combined with precarious self-confidence) to run away with us and create paranoid fantasies of oppression and lack of equity.

This paper is proposing, however, that sometimes, by welcoming a certain lack of knowledge, and allowing a level of uncertainty, we might allow for the unexpected to happen; we might allow room for the unknown within a project to take place; we might allow a project to "run away with us" a little and, in so doing, perhaps learn more than if we were to close all avenues off. It is a consequence of allowing this "unknowing" and "uncertainty" to remain part of a project that a certain level of fear is also present. As Rosenberg (2006) states in a recent paper, it is part and parcel with the nature of design practice that it embraces a difficult relationship with the known:

> Creative practice moves from what is known into what isn't known; not-yet-known or not-knowable. If academia is to accommodate practice it must accept the uncertain and the unknowable in practice – the non-epistemological dimension of practice. It needs to engage with the movement that is necessary in order to bring into being.

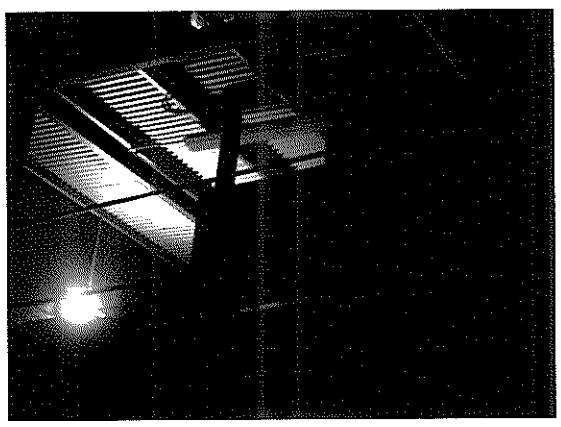
4. Design and Fear

As designers we fear failure. It seems self-explanatory that if a project has not achieved the objective for which it was brought into being, then the project has failed and consequently we have failed as designers. To overcome this fear of failure, we attempt to design our projects to reduce the chances of failure and increase the likelihood of a successful result.

It is, of course, not possible to remove all risks of failure. However, it is as we become more and more systematized in our design practice and put in place risk management systems that we can start to reduce the chance of failure to such a degree that it is negligible.

In doing this is it possible that we, as designers, lose the readiness to accept the unexpected in practice? This paper posits that by removing our fear through the antidote of known knowledge we might be taking away the opportunity for a project to generate the new and reveal the unknown. So it is put, rather glibly in the introduction to this paper, that we might turn Emerson's original statement around and say that fear is the antidote to knowledge.

5. Stairwell Series – The Project



This paper and the propositions put forward in it are inspired by a project named *stairwell series*. I completed this project with a colleague from my postgraduate design research group, Keith Deverell.

The project was produced while attending a conference in Brisbane[2], a city neither of us knew very well. Both Keith Deverell and I were acting as design researchers; our aim was to experiment and discover. We were both using a practice-led-research methodology.

6. Research Methodology

> To undertake to search, and search again, prompts us to challenge our assumptions with a commitment to intensify and better employ the assets at our disposal. The values, interests and effects that unfold through this process are many (Douglas 2004, p1).

Practice-led-research uses the application of practice itself as a research method, it applies the *thinking as doing* and *doing as thinking* nature of design to externalise and make material the knowledge which, as designers, we don't necessarily *know* that we have. The design work becomes a means of *thinking*

[2] SOOB (Straight Out of Brisbane) conference. A festival of independent and emerging arts, culture and ideas. Brisbane, 02 December 2004. http://www.straightoutofbrisbane.com

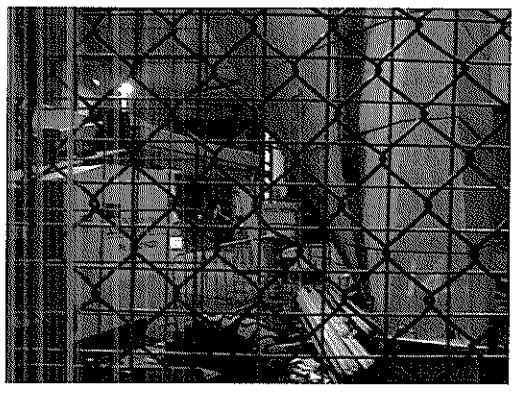
out loud, the work is, in time, critically reflected upon and analysed by both the practitioner/author and the members of the community of practice. The work is later reiterated, re-articulated and re-understood through the further materialising of artefact.

The artefact or system that is produced is an articulation of knowledge, it is the product of the method (the *making*, the *thinking as doing* and the *doing as thinking)* which designers use to articulate and externalise. The work is the bridge between subjectivity and objectivity, the self and the other. The practice involves process, the process is the work, the work allows a designerly research to take place - during the working. It is, necessarily, pre-literate - it unbinds us from language and allows our *designer-ly* sensibilities to open up and do the work that they do best. We can then go back to the work with the benefit of the device of language and reflect upon what we have just done/learnt/articulated.

7. Project Description

We went to Brisbane to be on a panel. The conference organizers indicated that they needed an exhibition for the stairwell. We realised that here was an opportunity for us to put into concrete form some ideas we had been discussing in relation to our research. We created a series of graphic provocations which embodied our shared view of this city we were both strangers to.

The project started with walking and talking and the taking of digital photographs. De Certeau (1984, p.100) talks of walking itself as a compositional act:

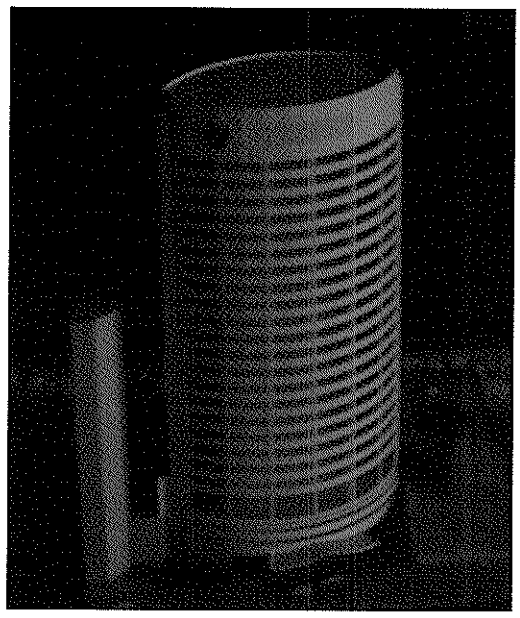


> There is a rhetoric of walking. The art of 'turning' phrases finds an equivalent in an art of composing a path. Like ordinary language, this art implies and combines styles and uses.

Before we knew, we were going to make anything suitable for the stairwell space, we started taking photos and discussing them. We had recently purchased new digital cameras. We discussed the amazing ability of these cheap compact cameras to capture images in very low levels of light.

At one point, we found our path along the river unexpectedly blocked as a new development claimed the waterfront, requiring us to retreat and go around this newly privatised and privileged space.

We came upon a strip of property development offices that promoted their developments with scale models, complete with citizens leaning on balconies and wandering through plazas. These models became *real* when captured by our cameras.



Scale was removed. The modelled building design was made material simply through processing in the CCD's of our cameras. The blur produced by the low light acted to enhance the reality of the image. Before our eyes, the miniature plastic

people took on their own stories, became real, had histories and desires. There were more people in the photos we took of the models than in the real streets around us.



Seeing the city through the eye of the camera led us to an abandoned building project, full of signs of activity and the will to create and enact change but devoid of the people it purported to serve.

These photos were an aesthetic response to the activity of walking and looking. The images were produced from the mix of conversation, half formed intent, and the stimulus of being in new surroundings. Our active looking fed off the digital reproduction of that looking, and produced further iterations.

Later that night, the photos were reviewed and sorted. We discussed the themes that were revealed and in what form they might be reproduced to start a "conversation" with our audience. We decided on a series of seven A0 black and white laser outputs. These posters had selections of the photographed images, cropped and adjusted, along with clear areas and graphic prompts to encourage viewers to take part in the conversation and add comments.

We encouraged direct response back into the work, adding clear space and providing pencils for viewers to add to the work. We hoped people would view the work and respond, continue the discussion we had started. We created a graphic space within which a community (of conference goers, mostly Brisbane based) might articulate itself; whether it be to that particular space and time; the conference; who they were; the place; or a response to our own response.

8. Fears

I had fears. I feared that I wasn't understanding the city correctly; what right had I to start the commentary, and did I know what I was talking about? I didn't know our audience; how would they read the work? I didn't really know what we were trying to do. I didn't know what sort of response we might get, we might get none at all.

We were not in control the situation. As designers, we had handed over authorial control by inviting others to participate in the making of the work. I had never done this before. We hoped the project would be a success, but the environment (the stairwell, the conference club, the city of Brisbane) was unknown to us. We did not have the knowledge to control or predict it. It was one of the first times I had collaborated so completely on a project with another designer. There were a lot of new aspects to this work. I felt fearful, but being in a different town, with different people, at a conference, gave me the ability to live with the fear of failure and the risk of design disaster.

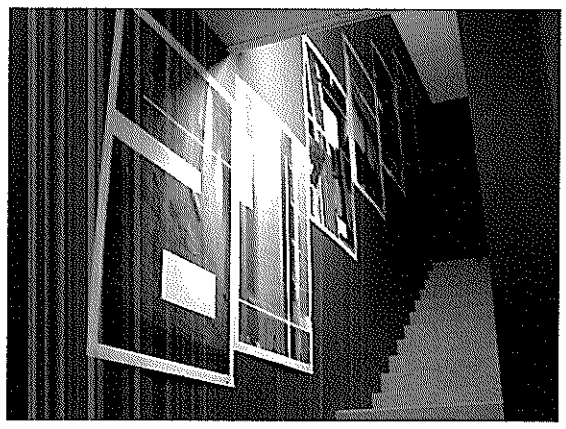
9. Project Intentions

The stairwell series project, unbeknownst to us at the time, was caught in the nexus of current debate on what constitutes design knowledge and how it might be valued academically. Rosenberg (2006, p. 2) informs this debate in his recent analysis of the pressure for design research to conform to an existing academic model:

> The heart of the Western Knowledge Project is research. The purpose of research is to study the world (the Other), adequate the Other so that it may be understandable/assayable in the court of the Same... and evolve theory through which one gains knowledge and control over the Other. Literally, put the Other in his, her or its place.

Rosenberg criticizes the "Western Knowledge Project" for co-opting research into the task of gaining knowledge for the control of the Other. There is no doubt that in designing the stairwell series we had *designerly intention*. We captured our response to the city through photography and the posters

were the articulation of that response. The formal element of encouraging audience participation was an untried device we felt might illuminate aspects of our research. We hoped that people would read the posters' themes and respond in kind, continuing the discussion we had started, adding their own points.



It was only in retrospect, upon viewing the response we received, that it became clear to me how strong my *designer's intention* had been; that I had attempted to prescribe the response; that I had very clear ideas of what I wished to receive back from the audience.

We invited people to view what we had to say and participate in that discussion. We acted as though we were chairing a meeting, or making a documentary; "could we get someone to say something interesting about a subject that we find interesting?"; "could we convince people to enter into the discursive space we have produced and *perform* for us?"

Asking for performance was not our conscious intention, it is only upon reflection that it became obvious how integral it was to the designerly intention; we wanted people to play our game, respond to our rhetoric, find our view interesting, perhaps even learn from the work.

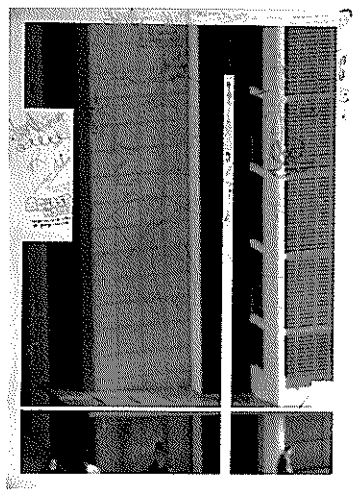
Our rhetoric was one of 'add your voice to ours'. It appeared to be open, but in reality it was closed, we had already set the tone for the responses. We required people to surrender their own volition and tick our boxes, we would then, as designers, feel exonerated, feel that we had taught people to *open their eyes, look at the world around them, and question their assumptions.* We were not generous, we were not *with* our audience, we spoke *down* to them with our graphic rhetoric.

The posters had narrative; they used graphic rhetoric to convey that narrative. The visual language of Communication Designers generally aims to speak with the rhetoric of knowing. It is this convincing rhetoric of knowing which acts to give a designed communication strength and clarity. The visual narrative appears clear and speaks with authority:

> 'Be quiet,' says the TV anchorman or the political representative, 'These are the facts. Here are the data, the circumstances, etc. Therefore you must...' Narrated reality constantly tells us what must be believed and what must be done. What can you oppose to the facts? You can only give in, and obey what they 'signify'. Like an oracle, like the oracle of Delphi (De Certeau, 1984, p.186).

That this authoritative narrative is a fiction, an argument through montage, is obvious upon analysis, but easily forgotten. It is in reflecting on this project that I start to understand that this designerly rhetoric of knowing can often serve to disallow both connection with audience and with the complexity of the world, both areas which the Keith and I were actually attempting to engage with.

10. Response to the Project



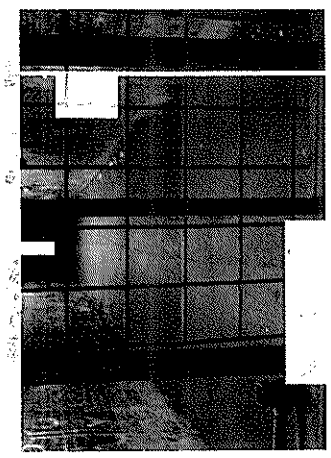
When we saw the work after it had been added to, it was a shock. I was appalled. Our audience had not played our little game; they had scrawled tags, drawn doodles, written smutty comments, and most annoying to me of all, drawn back in some of the parts of the photos which we had removed.

The audience to our work had "jammed" it; they had rejected our invitation for some self-satisfied pontification about urban renewal and had instead made the work their own. They owned it now, or at least the ownership had become truly shared. They intervened on our neat ideology and co-opted it. Their response was rude and raw, ugly and trashed, vain and provocative, a strong expression of individual egos fully a match for our own egotistical promptings. We had produced an attempt at control, by inviting participation we asked people to come under our control. They had rebelled against this attempted control and made their own statements.



It is often the effect of participatory systems that they invite only a certain type of participation. The authors and producers of the work require a certain response. In creating the work, an imagined audience/participant is present in discussion and is required to *produce the required response* on request. As designers we are pulling the strings; the audience is dancing. This is a closed system, the designers know the response they require, all they wish to do is to receive it. It is not about the audience; it is about us, the authors of the work, and the producers of the communication. It is a single ticket ballot designed to give us a renewed mandate to create and express.

11. Project as Disaster



This project was a disaster in terms of our designerly intentions; it did not work. We did not get the response that we were looking for. We failed to achieve the conversation we wanted to facilitate. We were insulted and the work was misconstrued and co-opted. It was a design disaster.

This "disaster", however, led me to reflect on what had happened. Initially, I was shocked and then embarrassed; we had failed, we had been misunderstood and jeered at. Months later it started to reveal itself to me; through discourse with my peers, through un-packing of the process and results. In this period, the value of the project as practice-led-research started to become apparent and make itself heard.

These aspects of the project and learning it yielded were not explicit when we put the posters on the wall. We truly felt we were experimenting with communication design work which invited and encouraged the articulation of the community within which it existed, we thought that we were providing an opportunity for people to speak and be heard. The reaction I had when I saw what had been added into our conversation was one of shock, embarrassment, the feeling of being misunderstood and of having failed. It was this reaction that revealed to me the underlying aspects of what we had been trying to achieve.

We were "jammed"; our audience did not react as we asked, deliver what we requested and toe the line. It was, however,

to the benefit of our research that our project was a disaster. Once our audience intervened on our neatly designed system the conversation truly started. It was the audience who recognised that we had put forward a facade of consultation and conversation. While we had attempted to dispense our ideology through image, while pretending not to.

As a design researcher, this project has been immensely valuable. It has proved a crucial element in my research. It has given me insight that might not have come otherwise. De Certeau (1984, p xii) posits the meaning of cultural production not being in the object itself but in the use of that object by its audience:

> The presence and circulation of a representation... tells us nothing about what it is for its users. We must first analyze its manipulation by users who are not its makers. Only then can we gauge the difference or similarity between the production of the image and the secondary production hidden in the process of its utilisation.

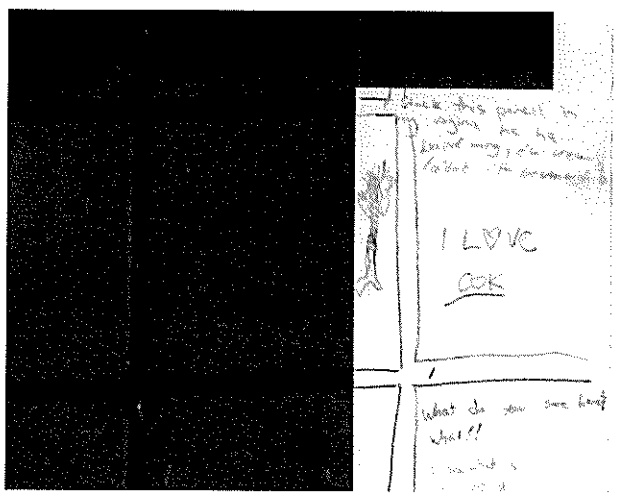
12. Conclusion

I have discussed two things in this paper. First, the knowledge which this project produced, secondly the reasons the project produced that knowledge.

This project allowed insights into the process of designing for audience. It brought into question the underlying rhetoric and power-play which is embodied in all designed work. It brought the question of audience, and the rights of that audience into prominence. The project did not provide answers to these questions, rather it made it obvious that these were important considerations to remain mindful of when considering design. As such, it provided an excellent early research tool and led onto further fruitful research.

The reason this project was a valuable research project and a knowledge producing process, was that it was not controlled. We attempted control, but we were on uncertain ground, unknowing of our audience and uncertain of the techniques we used. This uncertainty led to much fear, however, due to the lack of time, and the exuberant nature of a conference, we did not remove the fear by proceeding along safer, more well-known routes. The fear and the uncertainty freed the project and allowed it to teach us something. The fear and uncertainty, and the disaster of the project, allowed it to be highly generative as a design research project.

To revisit the initial quote and provocation, it is only because we, as designers, did not have the knowledge to control the outcome, did not know enough to banish our fear of failure, did not know enough to gather the responses we thought we wanted, that the project worked as well as it did. It was through allowing ourselves to go into the unknown, to work without being in total control, that the project functioned fully as a research project: Creating new learning and knowledge. Revealing unexpected and unknown prejudices on our part. Revealing the dangers of thinking that you know what you are doing but actually doing something else. Revealing the insult of appearing to ask for participation but actually asking for mute agreement. Demonstrating the responsibility of the designer to truly respect the agency of their audience, and not speak for them, or use them. Revealing that design is about the people within which the design process takes place. Revealing that design is about the community within which the design takes effect. Revealing that design is not about the exercising of the designers ego, it is about a conversation. Revealing that the idea of a *universal solution* or that design is about *solutions* at all might be outdated and autocratic. Revealing to design is to be situated in the difficult zone of contradiction, uncertainty and the unknown, and actively remain there.



In design research we may fear disaster, I would argue that it is sometimes in disaster, as it was with this project, that design research starts to be fruitful and to lead to new knowledge, knowledge that we don't already know.

One last point about Emerson; he owned some forested land near a small lake called Walden Pond. He lent it to his friend Henry Thoreau, who built a house and lived by the lake for over two years. Henry Thoreau gained the inspiration to write his classic treatise on human existence, *Walden; Or, Life in the Woods*. From his work comes the quote 'The mass of men lead lives of quiet desperation' (Thoreau, 1854, p5). He deliberated on the true necessities of life, and wrote of the danger of taking another's knowledge to be true for oneself (Thoreau, 1854, p7):

> Hippocrates has even left directions how we should cut our nails... Undoubtedly the very tedium and ennui which presume to have exhausted the variety and the joys of life are as old as Adam. But man's capacities have never been measured; nor are we to judge of what he can do by any precedents, so little has been tried.

Thoreau distrusted prescribed knowledge, he felt it as a limiting factor, it allowed his fellow humans the excuse to lazily remain in their own anguish. He was a provocateur, attempting to cajole the general population out of accepting their lot. He wrote his philosophy as narrative. He developed his own knowledge, based on his own experience, living in a hut of his own making, in the forest.

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DARWINIAN CHANGE: DESIGN FROM DISASTER

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1. Introduction

The world around us is full of surprises. Both the natural and the artificial environments are full of unanticipated consequences. Really bad surprises are called disasters but they can sometimes end up with some good consequences – the Rainbow effect.

This paper goes beyond the simple idea that disasters (both in nature and in human affairs) can sometimes have positive side effects. It claims that disasters are an important requirement for the emergence of design in complex systems.

We are not as clever as we like to think we are. Good design, rationality, science, intentionality, understanding etc. do NOT produce a better world for us to live in. The worlds of nature and of human affairs consist of complex systems with so many different variables and interactions that they are impossible to model and predict. The continued arrival of disasters is evidence that we are not in control of events.

The only known way that the appearance of design can emerge in a complex system is via what Charles Darwin called 'descent with modification under the influence of natural selection'. (This is not the same as 'survival of the fittest' – a term first used by Herbert Spencer whose ideas are still causing confusion about 'evolution').

Natural selection is not the 'cause' of anything – it is a filter that allows things that fit to have a chance of leading to something 'better' after further descent with modification.

This process of Darwinian change can, however, 'get stuck'. There are periods of what Gould called 'stasis' and what Elster calls 'local maxima' in which things have changed as much as they can and further changes are eliminated by the filter of natural selection. One way of escaping from such a trap is through a disaster that either alters the 'rules' of selection or clears the way for something that is there already to occupy the vacant space. This means that disaster can lead to events that otherwise would not have happened – the rainbow effect.

2. Two examples of the Rainbow Effect

Two examples illustrate this effect – one from biology and one from human society.

Disasters in the form of extinctions are crucial in biology. The first known dinosaurs appeared about 230-225 million years ago, in the late Triassic Period, following a major extinction of species. They lasted for nearly two hundred million years before another major extinction got rid of about a third of all animal species including most dinosaurs. This was a disaster for them but it was a blessing for those mammals that were around then because it allowed them to stop hiding under the ground and start the process that eventually turned up with us (Whether our arrival on the planet was a blessing or another disaster remains to be seen). During their long time on earth, the dinosaurs managed to produce a great variety of different species but they were still stuck with being dinosaurs (though it is possible that an early species led to a side channel

that became the birds). From the perspective of an extra galactic observer looking for the emergence of intelligence, the dinosaurs were stuck in a local maximum; you could not get from them to an animal with intelligence. Mammals were also stuck – they had to stay small, hiding under the ground to avoid being eaten and only emerging at nighttime. It was not until the dinosaurs had met their disaster that the way was free for mammals to emerge – in both meanings of the word.

An example from human affairs in Greece is provided by the events of 1922. Following the war between Greece and Turkey, the two governments agreed on what they called a population exchange, which in modern terms might be described as ethnic cleansing. Greek Muslims were shipped across the Aegean to Turkey and some one and a half million refugees whose way of life had been destroyed were shipped in the opposite direction. At first, this was seen as a disaster both by those forced to leave their homes and by the country that had to receive them. Major social problems and political instability accompanied this disruption. And yet, there was a rainbow effect. According to Yagou (2007), "the local economy was invigorated by the often skilled and relatively cheap labour provided by the refugees." As Clark (2007) puts it, modern Greece (and Turkey) were 'forged' in the expulsions.

Prior to this event, Greece had been trapped in a local maximum. Anyone attempting to design and manufacture a new product would have found that natural selection was preserving the status quo. It took a disaster to change the rules of selection. According to Gallant (2001), between 1924 and 1930 Greece witnessed its highest level of industrialisation up until that time. There were other spin-offs. The growth of a prosperous construction industry made it easier for Greeks to move from the country to the city. This was accompanied by innovation in architecture and in the design of fittings for living spaces as discussed in Yagou (2007).

3. Creative Destruction.

The economist, Joseph Schumpeter who coined the phrase, 'gale of creative destruction', recognized the importance of disasters in human affairs. In particular, he saw technological change wiping out old ways of life and creating new ones as shown in the following extract:

> The opening up of new markets, foreign or domestic, and the organizational development from the craft shop and factory to such concerns as U.S. Steel illustrate the same process of industrial mutation – if I may use that biological term – that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism. It is what capitalism consists in and what every capitalist concern has got to live in...
>
> Every piece of business strategy acquires its true significance only against the background of that process and within the situation created by it. It must be seen in its role in the perennial gale of creative destruction (Schumpeter, 1942, p. 83).

The extract above is noteworthy not just for its use of 'creative destruction' but also for its use of a biological analogy – 'industrial mutation'. Despite this borrowing from biology, Schumpeter's evolutionism was not the same as that proposed by Charles Darwin (1859). Schumpeter belongs to a different tradition. The 'creative' part of his phrase is borrowed from Bergson's 'Creative Evolution' and Bergson was influenced by Herbert Spencer. The Schumpeter, Bergson, Spencer tradition sees evolution being propelled by an inner drive ' (In Bergson's case, an 'elan vital'). It also sees it as being 'incessantly creating'. This is quite different from Darwin's natural selection.

4. Charles Darwin and Natural Selection.

Darwin did NOT discover 'evolution'. Many people before him, including his grandfather, Erasmus Darwin, had ideas about the 'transformation' or 'transmutation', of one species into another. Charles Darwin's contribution was to propose a mechanism to describe how this transformation took place. His mechanism combines modified descent with natural selection. Variations are produced by chance during modified descent and then subjected to natural selection, described in Darwin's own words:

> It may metaphorically be said that natural selection is daily and hourly scrutinising, throughout the world, the slightest variations; rejecting those that are bad,

preserving and adding up all that are good" (Origin 6th Ed, p. 60).

(The word 'metaphorically' was added to later editions of 'Origin' to counter the idea that you cannot have selection without a selector)

The process of 'adding up all that are good' is what gives rise to the appearance of design in nature. Darwin's natural selection is not internalist; it is a filter not a force and Darwinian change is not incessant; it can seem to stop at local maxima. As Darwin put it,

> A number of species, however, keeping in a body might remain for a long period unchanged, whilst within the same period, several of these species by migrating into new countries and coming into competition with foreign associates might become modified (1859 1st ed p. 367).

In modern terms, this short quote means that a group of species may reach an equilibrium that prevents any further large changes but one way out of this local maximum is to move somewhere else where the equilibrium does not exist. Another way out is for a disaster to get rid of some of the species and so destroy the equilibrium.

5. Natural Selection and Technological Change.

Sundt was one of the first writers to spot that Darwin's ideas worked for technological change as well as for biology.

Eilert Sundt, a Norwegian sociologist, visited Darwin in 1862, three years after the publication of 'Origin' (Darwin 1859). Sundt then wrote an interesting paper but unfortunately for us, he wrote in Norwegian. Jon Elster (1983), a historian at the University of Oslo has translated Sundt and gives an account of what he describes as Sundt's 'quasi-Darwinian model of technical change'. Sundt's account of change in methods of building is;

> Even when people who set up new buildings did not intend to deviate from custom in any way, it could easily happen that some small variation arose. This would then be *accidental*. What was not accidental, however, is that inhabitants of the house and the neighbours should *perceive* the variations and form an opinion as to their advantages and inconveniences. And it is then not at all surprising that when someone later wanted to set up a new house, he would carefully *choose* that house to *imitate* which seemed to him most useful. And when the idea of improvement in a definite direction had first emerged, someone more clever could then take a further step and actually envisage and carry out another improvement.
>
> From Elster (1983) p. 136-7, Elster's italics.

Sundt has a similar account of shipbuilding, involving accidental changes, perceived improvements, choice etc. leading to the idea that there could be a stopping point.

> When the idea of new and improved forms had first been aroused, then a long series of prudent experiments, each involving extremely small changes, could lead to the happy result that from the boat constructor's shed there emerged a boat whose like all would desire.

This gradual series of changes comes to a stop when, "Each kind of improvement has progressed to the point where further developments would entail defects that would more than offset the advantage".

Elster describes this approach as leading to local maxima which have the problem that they can not be further improved without going through some kind of radical change or by becoming worse in order to become better in a different way. One answer to the problem of local maxima is the concept that evolution happens somewhere else, as suggested by Darwin in the quote given above.

Another answer to this problem is the requirement for a change in the 'rules' of competition. People choose what to imitate and the reasons for their choice can often change. When this happens, a local maximum ceases to be the optimum and is replaced by something else. If the changes are large enough, the consequences can be seen as a disaster – at least to those who benefited from the previous rules.

6. Wars and Change

Change following the war between Greece and Turkey is but one example of the effects of a war. Various writers have noted the analogy between war and biological extinction.

For example, Michael Boulter, a palaeobiologist who specialises in extinction, claims that the events after the extinction of the dinosaurs are

> not unlike the upturn of the Western economies after the Second World War – hesitation to reacclimatise at the beginning, then a surge in diversification to reach new highs (Boulter, 2002, p. 12).

Historian Mark Mazower (1998) claims

> Modern democracy, like the nation-state it is so closely associated with, is basically the product of the protracted domestic and international experimentation which followed the collapse of the old European order in 1914 (1998, Preface, p. ix).

Mazower quotes the Czech politician Thomas Masaryk as saying that the First World War turned Europe into 'a laboratory atop a vast grave yard'. It was a 'laboratory' in which three rival ideologies – Communism, Fascism and liberal democracy - were tried as replacements for the extinct 'dinosaurs' ie four empires that had been swept away. These were the Ottoman, Habsburg Austro Hungarian, Tsarist and the Hohenzollern German empires. The graveyard included over eight million people killed in action.

7. Analogy or Real Similarity?

The time period when the dinosaurs were flourishing is bracketed by two major extinction events. Both involved the removal of many species and their replacement by what seemed to be an explosion of new forms. (The basic building blocks for these new forms already existed. New things don't just spring into being). As quoted above, Boulter compares this with events after the Second World War. Is this comparison just a poetic analogy or is there some significant similarity between biological and societal events?

There are three important similarities:

1. The biological world and the worlds of politics, economics and technical change are all worlds of incredible complexity. A wide variety of forms exists, competes and is copied if successful.
2. The only way in which a complex system can change without being destroyed is by a Darwinian process, which is capable of coming to rest at a local maximum or equilibrium.
3. Disasters are one way of escaping from such a resting place.

The major apparent difference between the two is human intentionality. Biological change has no foresight. Living things have the appearance of design but there is no designer. The appearance of design is generated by random changes followed by non-random selection and further iterations covering long time periods.

Animals have to strive in order to survive. Human striving has conscious intentionality but it is still a Darwinian process because there is no way of knowing the best thing to strive for and outcomes are uncertain.

8. Synthetic Rubber and World War II

The story of rubber and what happened when the Japanese took over the rubber plantations provides examples of the points made above.

By 1940, it was obvious that the American way of life rested on rubber, in the form of automobile tyres. The rubber came from trees grown in what is now Malaysia and the major US tyre manufacturers owned plantations there. In the UK, tyre manufacturers relied on the British ownership of the majority of the plantations which had been founded by British enterprise, involving the expertise of Kew Gardens in finding how to grow rubber plants obtained from Brazil (where they grew naturally) and then sending them round the British empire to find where they would grow without the use of greenhouses.

By the time of the First World War, the British had a steady, low priced, supply of plantation rubber to replace the wild rubber from Brazil and other parts of the world.

So by 1940, in those parts of the world with access to plantation rubber there was a local maximum type of equilibrium. The price of rubber fluctuated but there was no incentive to look for new sources.

All this was destroyed by the Japanese take over of the plantations. In 1941, the US strategic materials committee raised the alarm. The Japanese take over of rubber was a worse disaster than Pearl Harbour. It threatened the entire American way of life.

The way was clear for some new source of supply of rubber for tyres (and many other things). With American enthusiasm and government money from the Federal Reserve Bank, five possible ways of obtaining rubber were explored. These were:

1. Send a team with a lot of money to Brazil to see if the supply of wild rubber could be re-established. The team and the money were never seen again.
2. Could rubber be grown in the USA? The answer was 'NO!'
3. Recycle old tyres. The American public was cajoled into extracting all those old tyres lying around in fields and the backs of houses. But reclaim rubber could only be used when mixed with new rubber.
4. Ask the scientists. The best they could come up with was silicone rubber which had a few specialist applications but was useless for tyres.
S. Ask industry. Dupont was able to point out that they manufactured a synthetic rubber, Duprene, which had been developed because of its oil-resistant properties. It was used in seals, gaskets etc but was expensive and not much use for tyres.

The disaster was finally averted by some German know-how. This is an example of Darwinian change taking place 'somewhere else' (as in the above quote from Darwin). In the 1930s, under a Nazi government, thinking of war, German industry had been encouraged to develop a synthetic rubber made from butadiene with a sodium (Na) catalyst – hence the name Buna rubber. This process had been discovered by Manchester chemists who set up a factory in 1912 but had to give up because the new plantation rubber was selling in London for about one tenth of the price of their synthetic rubber.

In Germany, an import tax on plantation rubber changed the rules of competition in favour of Buna rubber synthesised by the German chemical industry. The German know how had arrived in the USA via an exchange of patent information and Buna rubber became the way to save the American way of life.

However, industry protested that it would take tine and money to get Buna into production. So the government decided to do things themselves under wartime powers. Government funded factories produced GR-B ie Government Rubber from Butadiene (They also produced GR-S from Styrene). This was done very successfully and within two years, the tyre manufacturers were supplying the needs of both the civil population and the war effort. This was achieved in the land of the free and belief in hands-off government.

After the war, the US government was embarrassed to find itself owning manufacturing industry (socialism – shock horror) and the rubber producers were quickly privatised. In Canada, with a more relaxed attitude, the government supported its own rubber producer, Uniroyal, which continued to produce synthetic chemicals successfully – including a herbicide used by the Americans in Vietnam.

Synthetic rubber had now been released from the trap of being far more expensive than natural rubber. With the new oil-based chemical industry supplying materials, a host of diverse new products became available; but in this case the old material, natural rubber, did not disappear and still occupies its own niche alongside the synthetics.

9. Design

Some readers may have wondered what the synthetic rubber story has to do with design. If so, they have a too narrow concept of design and designers. Bruce Archer, discussing designers, claimed

> If the subject matter is a machine, the designer will be an engineer. If it is say furniture, the designer may be an industrial designer. But if the subject is a detergent, the designer may be an industrial chemist (Archer, 1974, p. 9).

Thousands of individual chemists, engineers, rubber technologists, politicians, managers etc were involved in developing and manufacturing a new raw material for tyres. This shows a similarity with biological change. The geneticist, Theodosius Dobzhansky helped lay the foundations of evolutionary biology through his work on fruit flies in the 1930s. He claimed (1937)

> Experience seems to show that there is no way toward an understanding of the mechanisms of macro-evolutionary changes, which require time on a geological scale other than through a full comprehension of the micro-evolutionary processes observable within the span of a human lifetime and often controlled by man's will (Dobzhansky, 1937, p. 12).

Dobzhansky used the metaphor of 'fitness peaks' but he thought that changes in gene populations were capable of explaining how to get from one peak to another. As Ruse (!999) points out, the idea that the macro could be explained by the micro has been resisted by palaeontologists who use fossils as evidence for thinking about macro change. Their sense of importance and need for funding was not going to let geneticists tell the entire story. In particular, the rise of new species was not just a matter of slow accumulation of improvements; it needed something else.

Changes in gene populations or in human design specifications can get trapped in circumstances that prevent them from being utilised. For genotypes stuck in a local maximum there are two ways out – disaster and 'evolution happens somewhere else'. For human design, there is a third possibility, that is changing the rules of competition as happened when the German government imposed an import tax to make natural rubber more expensive. This alternative of intentionally changing things does not guarantee any sort of progress; it could be argued that the German success in developing a synthetic rubber industry helped to make war more possible.

10. Some Lessons.

Some lessons for people who make decisions about the nature of artefacts and their manufacture can be discerned. These are:

1. Some humility is needed. There is no way of predicting the future of a complex system and there is no way of knowing what will be 'better'. The people who made decisions about Concorde believed that a faster aircraft must be 'better'. But the rules of competition changed and Concorde is no more. This, of course, does not stop people from striving.
2. Go for variety. Those countries with a Ministry of education deciding what all its schools will teach are ignoring the facts that there is no way of knowing what is best and that a variety of knowledge like a variety of genes is the best form of defence against an uncertain future. Old wisdom like not putting all your eggs in one basket is applicable.
3. You cannot change the world through designing. You have to wait until the rules change. The aims of sustainability and preventing climate change require us to escape from our present global trap of dependence on oil. Government tax incentives could help but unfortunately it might take a disaster to really change things. When London is flooded, things will change. If this happens, there will be no time to develop new things. They are there already like the mammals hiding underground or the know how for Buna Rubber filed away in America.

In the 1930s, before the Arab oilfields were discovered, it looked as though oil would run out. Many ways of using solar energy were investigated and are still around. Let us hope that it will not take a disaster to make us use them.

Footnote

A fuller discussion of Darwinian design, involving the use of memes (replicating ideas) is provided in Langrish 2004. A good summary of many of the issues involved in evolution and design practice has recently been provided by Jennifer Whyte (2007).

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THE INVISIBLE SHADES OF DISORDER

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Abstract

Design, in contemporary times, arose in the West as a humanizing response to the rapid industrialization. In its initial movements, it appeared as the Art Noveau[1] movement and at Bauhaus[2] and later at the Ulm school in Germany;a few decades later it appeared as the spirit of innovation and entrepreneurship that characterized mid-nineteenth century America. These approaches were key influences in the formative years of design education and practice in India.[3]

Unlike modernism that was characterized by a search for universal truths,[4] the post-modern critique[5] suggested that globalization led to a pluralistic global society that was without a dominant center of political power, or intellectual capital; the postmodern view was inclined to subjective knowledge as the dominant form of discourse. Thus notions of design that had characterized the modernist era with its emphasis on objectivity and universally applicable ideas of aesthetics underwent changes that sought to reflect the 'local in the global.'

Globalization is a relatively new phenomenon the implications of which are yet to be understood. Just as the critique of colonialism and modernity problematized the power-relations inherent in its mapping of the 'other', a critique of globalization is likely to throw up its own set of questions.[6]

[1] Art Nouveau was not just a mere style; it was a way of thinking about modern society and new production methods. It attempted to redefine the meaning and nature of the work of art.

[2] One of the main objectives of the Bauhaus was to unify art, craft, and technology.

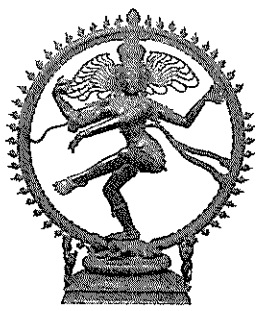
[3] The American Designer Charles Eames was invited by the Government of India to formulate an approach to design studies in India. The 'India Report' drafted by Eames led to the establishment of the National Institute of Design at Ahmedabad. The Industrial Design Centre at IIT Bombay, was modeled on the lines of the Ulm School in Germany. The IIT's were envisaged as premier institutions for scientific research and technology, by the Government of India, keen to usher in a spirit of modern-scientific inquiry.

[4] 'Both "modernity" and "post-modernity" are used in a bewildering number of ways. But "modernity usually means the set of events that were set in motion with the Enlightenment, from Descartes to Locke to Kant, and the concomitant technological developments, which moved from feudal agrarian with a mythic worldview to industrialization and a rational worldview. And"postmodernity"usually means, in the broadest sense the whole sweep of post-Enlightenment developments, which also includes post-industrial developments.' Wilber Ken, A Brief History of Everything, Dublin, Gateway, 2001, p. 48.

[5] 'The demand of postmodernity. The demand of an integral view. This does not mean that everything called "postmodern" is an attempt at this integration. Much of postmodern thought is extremist, nihilistic, narcissistic. But the more authentic currents of postmodernity, as I use the term-from Hegel to Heidegger to Habermans to Foucault to Taylor-are trying to get some balance back into the picture, largely trying to honor science and morals and aesthetics equally, and not simply reduce one to the other in an orgy of theoretical violence.' Wilber Ken, A Brief History of Everything, Dublin, Gateway, 2001, p.120.

[6] Though the post-modern critique did question notions of 'intellectual property' and 'authorship' it is not yet clear whether cultural plurality is truly synergistic and not a new form of colonization that takes place in the virtual domain.

Has design become a self-serving discipline that is deeply subservient to the belief that technology is the only key to some of the crisis[7] that face us today? This paper outlines some of the invisible shades of disorder that face us today and introduces integral approaches[8] that seek to understand the human condition at the beginning of the twenty-first century.



A bronze sculpture of Nataraja, symbolizing the god Shiva dancing with disorder.

Introduction: Interpreting 'Design'

'Design' is used to suggest very diverse pursuits, and before getting into the main body of the paper, it would be useful to outline what it implies in this case. Broadly, the word 'design' suggests intent and awareness. Thus a gardener shaping a bush in a garden to make a 'bush-sculpture' is designing; an artist who is contemplating the delineation of space on a canvas is designing; a scientific researcher planning a new integrated circuit-board is designing; a cook, carving a pineapple for a salad is designing; an automobile designer working with industrial clay for a new model is designing. Of all these examples, it is the last one that is closest to the sense of the word 'design' as used in this paper.

To spell out the interpretation, the word 'design' refers not just to a professional activity – for that would apply equally well to the gardener, the artist, the scientist or the cook – it is also suggested exclusivity. That is to say, the usage of the words 'design' and 'designers', often (implicitly) suggests an exclusive activity that is unique and different from other professions. Thus one may observe that while there are many who may claim to be designers, it is actually 'designers' who design![9]

The strength of the design approach, lay in its avowed intention to be a holistic discipline – a characteristic that was evident at Bauhaus that sought to bring together craft persons and artists in an attempt to develop broad-based responses to societal needs; and it was true for design as a reformative movement in its early years when other specialized disciplines (in particular science and technology) were being pursued as water-tight compartments – very often distanced from the social milieu in which they worked. In such a scenario, the spirit of integration came as a breath of fresh air.

With the passage of time, when the initial euphoria of suggesting a 'design-synthesis' had diminished, the spirit within design seemed to ossify, and the discipline of design began to transform into a profession and a specialized field of study, called design with capital letters and manifested as designer labels and designer brands.

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[7] Jiddu Krishnamurti suggests that contemporary civilizations have made enormous strides in ensuring material prosperity, but psychologically remain at a primitive stage of development.

[8] In particular we look at views in this regard by Sri Aurobindo and Ken Wilber.

Aurobindo Ghose was born on 15th August 1872, in Calcutta, India, and went to Cambridge for his education when he was just seven. Soon after returning he joined the movement for Indian independence. Tough arrested in 1908, for the possession of weapons, he was acquitted and spent the last 40 years of his life working in Pondicherry for the goal of bringing about a new spiritual consciousness. He came to be known as Sri Aurobindo and termed his approach as "Integral Yoga"; unlike earlier Yogi's he held that yoga and spirituality need not involve retreating from the world.

Kenneth Wilber was born on 31st January, 1949, at Oklahoma City, USA. He Works outside the academic mainstream and is an American integral thinker who draws upon the disciplines of diverse disciplines: from science and systems theory to psychology, sociology, philosophy, postmodernism, and spirituality - to develop an 'integral theory of consciousness.

[9] Though design began as an inter-disciplinary field, and still lays claim to this, one encounters the need amongst them to also claim to be an approach that is unique. While such posturing can be understood of a new discipline that seeking to connection other disciplines – and hence regard itself as interdisciplinary, to claim exclusivity undermines its strength. One cannot lay claims of ownership to the bridge one builds by connecting others.

And like any other field of study, design too started developing its inner logic and subdividing into 'specialized design studies' – and thus one got to hear of product designers, and then fashion designers, graphic designers, typographers, communication designers, graphic user-interface designers, web designers, user-experience designers, human-computer interface designers, animation designers, automobile designers, and even emotional designers! The vitality that was very much apparent in the reaction to the facelessness of industrialization began to lose some of its youthful vigour, as it became a mainstream occupation in its own right.[10]

The Global Faces of Design

If one seeks to understand the nature of design activity in the world today, one would visualize it a little differently depending on where one came from – geographically, economically, politically and indeed philosophically.

Varying interpretations on account of geography, would perhaps be notions of 'design as cutting-edge ideas, materials and technologies' in America; of 'design as a tool for empowerment' in Bangladesh; of design as 'craft-interventions in India and China' and of design as a economic tool in Korea'. Clearly, the situations we encounter today are indeed complex and one needs to proceed with utmost sensitivity; for any obvious stereotyping,[11] might take away from the understanding that is being attempted.

Viewed with the cold logic of the marketplace, India (and Asia) does appear as a place for cheap skilled labour (and some of the skill is in the intellectual domain of software). This is what has largely led to the inflow of investment from multi-nationals and shaped the new design curriculums in design schools in India. To a certain degree, the growth of the Indian middle class and its increasing power to purchase has also resulted in a spurt of design activity and design schools. However, the emerging situation is not without its inner tensions and conflicts.

For instance, the open work culture in multi-nationals is often far more attractive to the labour-force than the feudal-mindset that still characterizes some of the national organizations. The entry of primarily capitalistic forces has reshaped the Indian mentality to labour and addressed inequities in the highly regimented societal structure. It has altered the earlier conservative attitude prevalent amongst the middle classes to risk-taking, entrepreneurship and wealth creation. It is to an extent that weathered the criticism on profit-making institutions such as multi-nationals cannot be philanthropic.

Indeed, many of the multi-nationals have human resource development very high on their agendas with policies that spell out various aspects of work ethics with a transparency that was seldom encountered before. Yet, it cannot be denied that without making huge profits, they cannot possibly afford to pay the kind of remunerations they offer to the 'cheaply-available' labour force; and one of the principles latent in multi-nationalism the flow of capital to places where labour is 'relatively-cheap'. Not everything that one witnesses in the age of globalization is praiseworthy.

In a sense, these paradoxes are not peculiar to our age and time. What was earlier the cold war between the communists and the capitalists, is now the mutual disregard between nationalistic and multi-nationalistic sentiments; though at times one does get the impression that some invisible juggernaut is in the process of bulldozing all dissent and flattening alternate voices that question the march of globalism.[12]

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[10] Perhaps such a transformation is an inescapable outcome of a fresh innovation slowly becoming a tradition that can now afford to reflect on itself. This self-reflectivity that characterizes other fields that have slowly developed a history is also apparent in the new opportunities for 'design-research'. In its younger days, research was implicit to the act of design.

[11] The Indian diaspora has actively sought to re-position India as a hub for design and change the perception that India is to be viewed as a source of 'cheap skilled labour'.

[12] One may observe that it took a few centuries for the modernist spirit (that can be traced back to the Enlightenment in Europe) to find its full expression and another couple of centuries for a critique of modernism to appear. Indeed the logical conclusion to the application of rationality had its darker manifestation in the holocaust; and the birth of existentialism expressed eloquently by Sartre, Kafka, Camus symbolized the critique of modernity. A thorough critique of globalism might well take its own time to develop.



A global picture of the world at this point presents, as always, a multi-layered view of people and cultures that have aspects that are indicative of new transformations in languages, habits and lifestyles. One may observe that never before has the world been one community as it is today, and yet such an observation does gloss over the increasing divergences and rigidities that have also crept into world-views. It might seem that the ease of travel and the spread of tourism would help people understand one another better; yet it is also true that the highly polarized stances with constructs such as "axis of evil" are reminiscent of the excesses of an earlier era that victimized certain groups of people on the basis of their ethnicity. The polarization is not just between America and the Islamic world – one observes incidents of 'ethnic cleansing' all over – in Europe, as well as in India – thereby suggesting that the 'transformations' brought about by the global age may at best be superficial movements, bereft of true understanding and genuine compassion. The words of the eminent historian of our times, Arnold Toynbee are noteworthy.[13]

The critique of globalization is likely to include questions about the nature of progress and development; about the nature of technology and design; and at its root, the nature of the mindset that drives and shapes these. The disorder[14] and the dualities that one witnesses, leads one to regard the nature of power itself, as the subject of a critique.[15] One must necessarily lean to a more philosophical attempt at understanding the relationship between disorder and design.

Order and Disorder

Order emerges from disorder and in turn is swallowed by a new order. Cyclical and evolutionary theorists shall continue to debate, much in the manner of Candide and Pangloss in Voltaire's satirical take on the Enlightenment[16] in seventeenth century Europe. The metaphor of the universe as a set of eggs continually turning inside-out without breaking,[17] suggests a sense of some invisible order underlying the visible chaos of the cosmos in its minute and magnificent manifestations. Perhaps each age creates its own order that includes the order that was perceived by an earlier age – though it is likely that an earlier age also contains within it the potential of all its future fulfillment. In the contemporary age, that we tend to associate order with reason and rationality; and disorder with all that was irrational. However, it has been acknowledged that some of what appears as 'irrational' to the logical eye, when viewed from an alternate frame of reference, may contain truths belonging to realms that surpass reason.[18]

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[13] 'But why study history at all? ...Within the last five hundred years, the whole face of the globe, together with its air envelope, has been knit together physically by the amazing advance of technology, but mankind has not yet been united politically, and we are still strangers to each other in our local ways of life, which we have inherited from the times before the recent 'annihilation of distance'. This is a terribly dangerous situation. The two World Wars and the present worldwide anxiety, frustration, tension and violence tell the tale. Mankind is surely going to destroy itself unless it succeeds in growing together into something like a single family. For this, we must become familiar with each other's history, since Man does not live just in the immediate present. We live in a mental time-stream, remembering the past and looking forward – with hope or with fear – to an oncoming future.'
Toynbee Arnold, A Study Of History, Singapore, OUP, Thames and Hudson, 1972, (see Foreword to the abridged edition).

[14] 'On one hand we face a political and economic crisis and on the other, a demographic and ecological crisis.'
Huxley Aldous, Essays of Aldous Huxley, India, Macmillan, 1973, p.77.

[15] 'A small rapacious class feeds unsatiated on the misery of millions.'
S. Shankar, The Enemy Within, 1996.

[16] 'Enlightenment in general served many useful and extraordinary purposes. We might mention, the rise of democracy; the banishing of slavery; the emergence of liberal feminism; the widespread emergence of empirical sciences, including the systems sciences and the ecological sciences; an increase in average life-span of almost three decades; the introduction of relativity and perspectivism in art and moral and science; the move from ethnocentric to world centric morality; and in general the undoing of dominator social hierarchies in numerous ways. Wilber Ken, A Brief History of Everything, Dublin, Gateway, 2001, p. 63.

[17] A metaphor suggested by poet and storyteller, W.B.Yeats.

[18] It (evolution) is always struggling to establish new limits, and then struggling just as hard to break them, to transcend them, to move beyond them into more encompassing and integrative and holistic modes. And where the traditional sex roles of male and female were once perfectly necessary and appropriate, they are today becoming increasingly narrow, outmoded and cramped. And so both men and women are struggling for ways to transcend their old roles, without - and this is the tricky part - without simply erasing them. Evolution always transcends and includes, incorporates and goes beyond. Wilber Ken, A Brief History of Everything, Dublin, Gateway, 2001, p. 5.

The Buddhist notion of compassion (which is also a tenet of the other religions as well) may be regarded as one such realm. For instance, the difficulty of the rational age to come to terms with the issue of capital punishment,[19] is negotiated in an entirely different manner when one is willing to include compassion as the basis for the organization of life. The technique of encoding subtle world-views into stories, suggests that the seeds of higher realizations are already present in the efforts of saints who lived several centuries before. An attempt at understanding some of these ideas by contemporary mystics and philosophers will open up doors of perception invisible to the linear order of the rational age. Thus what appears disordered deserves scrutiny, lest one miss the invisible order embodied in it.

Order: The Age of Reason

The birth of science shook the foundations of religion. The 'godlessness'[20] that characterizes many contemporary societies, was prophesized by Nietzsche's proclamation that 'God is Dead!' While one may see a negation of this in Einstein's remark that 'God does not play dice with the universe' one may also interpret it as a new improved version of 'God' as 'design' that governed the intricate clockwork and intimately interwoven strands of time and space; and of matter and spirit. One may also conclude that though science undermined the stranglehold of organized religion (which was more about power than about religion) it perhaps did not exclude the religious experience.

However, in its popular manifestation it substituted the pursuit of art and religion by becoming the new miraculous[21] discipline. Being increasingly skeptical of the mysterious in the obfuscating sense, the rational mind was keen to demystify. The intellectual creativity that flourished effectively challenged many of the old dogmas and false beliefs. The unfolding of 'Design' is inextricably linked to the march of science. It is this that explains its position of power in the hierarchy of the new world that was shaped by the systematic application of sound scientific principles.[22]

Reason, became the principle that came to be deployed to organize human life. In the political arena it shaped the birth of democracies. Difference and doubt were integral to rationality. Unlike the earlier era that suppressed dissent with an iron hand, the age of reason sought to resolve it through civilized debate. In the social sphere, the power of reason was used to reform oppressive hierarchies. In an individual's life, it led to a responsibility for one's own life and this in turn led to a new found respect for the self-made person. This brought with it new notions of intellectual property and laws were made to protect the rights of the individual. The realization that equality was a condition that should include women and children brought about newer legislations.[23]

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[19] Arthur Koestler records the self-contradictory dilemma of the rationality in the following paradox:
'The murderer has killed. It is wrong to kill. Therefore, let us kill the murder.'

[20] '...most of the world's great wisdom traditions are, in various ways, against modernity. Modernity is viewed as the great antireligious movement, the great movement of rational secularization, which "killed" God....Killed the mythic God, yes. But Spirit is in the overall process, not in any favored epoch or period or time or place. Reason has more depth than mythology, and thus actually represents a further unfolding of Spirit's own potentials. The rational denial of God contains more spirit than the mythic affirmation of God, simply because it contains more depth. The very movement of modernity is a collective increase in the Spirit's freedom, evidenced amongst other things in the great liberation movements that define the very core of modernity.'
Wilber Ken, A Brief History of Everything, Dublin, Gateway, 2001, p. 293.

[21] It seems truly miraculous that a whisper into a cell-phone travels almost instantaneously half-way round the globe - from a conference room in Turkey, walled and air-conditioned, to a tiny hamlet in India!

[22] "Art, after a short-lived alliance with positivism, had soon protested, revolted, taken refuge in the dream, unsuspecting that soon science was to claim the dream itself as one of its legitimate domains of investigation. Science seemed to be the destroyer of the marvelous and the mysterious. The resentment was not untouched by a certain amount of jealousy on part of the artist in regards to the strides made by the scientific inventor.'
Balakian Anna, Surrealism: The Road to the Absolute, London, George Allen and Ulwin Ltd, 1970, p. 81.

[23] "Because of social relations that began to organize themselves around the basic forces of production - in this case the plow - men began to dominate the public sphere of government, education, religion, politics. And women dominated the private sphere of family, hearth, home. This division is often referred to as male production and female reproduction.'
Wilber Ken, A Brief History of Everything, Dublin, Gateway, 2001, p. 47.

Reason can bring about understanding and empathy, but it is Reason that causes us to rise in revolt and righteous anger. Whenever there is a conflict, the opponents firmly believe that each of them is right and have an elaborate set of rational arguments to justify their stances. One may regard the Age of Reason as advancement over an earlier age of superstition and blind beliefs; it is by no means the culmination of the evolutionary process.

If it was the age of reason that unlocked the energies within the atomic nuclei to fuel and power cities it was the limitations of reasoned arguments that justified the necessity of unleashing the same energies,[24] with devastating effects to teach unforgettable lessons to those who were like us and yet unlike us. The human self, despite the magnificent strides that allowed it to soar in rockets and planes that flew despite being heavier than air, was weighed down by a dark side that prevented it from seeing the 'Other' as an intimately connected part of the same self. Thought and reasoned arguments had become the barrier that prevented us from feeling the pain of another. Clearly, reason had its limits.

Disorder: The Limits of Reason

David Bohm, who was a Professor of Theoretical Physics at Birkbeck College, University of London in a series of conversations with Jiddu Krishnamurti discusses thought and the limits of thinking. It is relevant to examine some of his notes from his work 'A Brief Introduction to the Work of Krishnamurti.'

> ...we went on to consider the general disorder and confusion that pervades the consciousness of mankind. It is here that I encountered what I feel to be Krishnamurti's major discovery. What he was seriously proposing is that all this disorder, which is the root cause of such widespread sorrow and misery, and which prevents human beings from properly working together, has its root in the fact that we are ignorant of the general nature of our own processes of thought. Or to put it differently it may be said that we do not see what is actually happening, when we are engaged in the activity of thinking'.[25]

Thus, one may conceive of chaos and disorder as opposed to order; chance and serendipity as opposed to design; pleasure as opposed to pain; life as opposed to death but all of these constructs remain restricted as binary oppositions.

The surrealist movement in Europe, sought to delve into the realms of the layers of human consciousness, not available to its conscious workings. Guillaume Apollonaire[26] in the early nineteenth century, called himself and those like him 'pilgrims of perdition' because they were risking what intellectual security they had as artists to explore the uncertain and the unproven.

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[24] The representation paradigm was dualistic in this sense: the subject doing the mapping was not really a part of the world that was being mapped. The alien mapmaker simply stood back from the pregiven world and mapped it, as if the two entities had virtually nothing in common.
Most "new paradigm" approaches fall into this dualistic trap, because it is a very very subtle trap. Most new paradigm aproaches simply think that getting a more accurate map will solve the problem.If we had a nice holistic and systems map, instead of a nasty atomistic and mechanistic map, that would heal the dualism.
...The nondualistic approach doesn't deny the representational paradign altogether; but it does say that at a much deeper level, thought itself cannot deviate from the currents of the Kosmos, because though itself is the product and performance of those very currents. And the task of philosophy, as it were, is not to correct their deviations from reality, but to elucidate these deeper currents from which thought could not deviate, even if it wanted to!
Wilber Ken, A 8rief History of Everything, Dublin, Gateway, 2001, p. 59.

[25] This is referenced from: http://www.ratical.org/many_worlds/K/

[26] 'Why not a parallel between the creativeness of applied science and the arts? In his preface to Le Mamells de Tiresias he created the word "surreal" to designate the human ability to create the unnatural, and he pointed out that man's first surrealistic act was the creation of the wheel, which imitates the physical function of motion but creates a form entirely independent of the forms known to exist in nature.'
Balakian Anna, Surrealism: The Road to the Absolute, London, George Allen and Ulwin Ltd, 1970, p. 81.

Anna Balakian, in her work, 'Surrealism: The Road to the Absolute', observes:

> While literature had been neglecting imagination, science had learnt to make maximum use of it. It had cast aside the known patterns of matter and through ingenuity had created new ones. Science's contribution in Apollinaire's opinion, was its ability to give reality a relative meaning and thus liberate it from an assumed synonymity with the natural. The unnatural could become a reality, as twentieth century objects, which had no connection with nature, were proving more conclusively every day. The factory worker was all the time creating reality (Balakian, 1970).

Their views are echoed a century later in the following view:

> If worldviews have evolved from archaic to magic to mythic to rational and existential... who is to say that there aren't higher worldviews down the road? (Wilber, 2000).

Integral Approaches

Wilber goes on to revisit various themes suggested by Schelling, Hegel, and Aurobindo.

> ...we can look at the higher stages of the evolutionary unfolding, according to the world's greatest wisdom traditions - the higher or deeper stages where the Spirit becomes conscious of itself, awakens to itself, begins to recognize its own true nature.These higher stages are often pictured as mystical or "far-out", but for the most part are very concrete, very palpable, very real stages of higher development - stages available to you and me, stages that are our own deep potentials (Wilber, 2000).

The duality that stems from objectifying experience leads us to view essences as oppositions.[27] The relationship between individuals and societies has often been characterized by stress. We derive much from a sense of community and we are also driven to seek fulfillment as individuals and these two movements often pull at us from opposite ends.

In a lighter vein, Lewis Thomas[28] in a fascinating essay observes that 'ants are so much like human beings as to be an embarrassment. They farm fungi, raise aphids as livestock, launch armies into wars, use chemical sprays to alarm and confuse enemies, capture slaves. The families of weaver ants engage in child labor, holding their larvae like shuttles to spin out the thread that sews the leaves together for their fungus gardens. They exchange information ceaselessly. They do everything but watch television.'

Sri Aurobindo, a poet, mystic and seer of the twentieth century, presents a detailed analysis of human life[29] in his work, 'The Human Cycle' and suggests that we shall witness a decline of reason as the basis of life. Human life, he suggests will begin to be governed by forces that are 'supra-rational'.[30]

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[27] But at present the human intellect has been so much mechanized by physical Science that it is likely to attempt the revolution it is beginning to envisage principally or solely through mechanical means, through social and political adjustments. Now it is not by social or political devices, or at any rate not by these, chiefly or only, that the unity of the human race can be enduringly or fruitfully accomplished. Sri Aurobindo, The Human Cycle, Pondicherry, SABDA, The Turn Towards Unity, p. 263.

[28] Thomas Lewis. The Lives of a Cell: Notes of a Biology Watcher, 1974, Viking Press.

[29] 'The essential features are the same in Russia and the Fascist countries... there is a seizure of life of the community by the dominant individual leader; there is a rapid crystallization of the social, economic, political life of the people into a new rigid organization effectively controlled at every point; there is the compulsory casting of thought, education, expression and action into a set iron mould, a fixed system of ideas and life motives, with a fierce and ruthless, often a sanguinary repression of all that denies and differs; there is a total unprecedented compression of the whole communal existence so as to compel a maximum efficiency and a complete unanimity of mind, speech, feeling, life.' Sri Aurobindo, The Human Cycle, Pondicherry, SABDA, The Curve of the Rational Age, p.193.

[30] Modern Science, obsessed with the greatness of its physical discoveries and the idea of the sole existence of Matter, has long attempted to base upon physical data even its study of Soul and Mind. ...The French Revolution, it is thought, would have happened just as it did and when it did, by economic necessity, even if Rosseau and Voltaire had never written, and the eighteenth century philosophic movement in the world of thought had never worked out its bold and radical speculations. Recently however, the all-sufficiency of Matter to explain Mind and Soul has begun to be doubted and a movement of emancipation from the obsession of physical science has set in, although as yet it has not gone beyond a few awkward and rudimentary stumblings. Sri Aurobindo, The Human Cycle, Pondicherry, SABDA, The Cycle of Society, p.1.

He outlines the conditions for the coming of the spiritual age, and observes that it is only when the ego is abandoned do we get a chance of achieving spirituality in his inner and outer life. The freedom from the egoistic standpoint is the first and the most prominent characteristic of such a society.

> 'A spiritualized society would treat in its sociology the individual, from the saint to the criminal, not as units of social problem to be passed through some skillfully devised machinery but as souls suffering and entangled in a net and to be rescued, souls growing and to be encouraged to grow, souls grown and from whom help and power can be drawn by the lesser spirits who are not yet adult. The aim of its economics would be not to create a huge engine of production, whether of the competitive or the co-operative kind, but to give to men - not only to some but to all men each in his highest possible measure - the joy of work according to their own nature and free leisure to grow inwardly, as well as a simply rich and beautiful life for all.'

Interestingly, one may observe in the chapter 'The United States of Europe'[31] of Sri Aurobindo's 'The Human Cycle', a parallel with events that led to the formation of the European Union.

Conclusion

The transition to post-industrial societies that had ascended the hierarchy of needs from better designed products to personalized goods and services, was accompanied by a similar transition in design activity. Design evolved from its earlier engagement with the tangible world, to engaging with the world of intangibles and experiences. The earlier concerns did not disappear altogether - for the need for well designed products never really ceased; but these concerns now sought a deeper understanding of human needs. If the earlier approach was determined largely by material aspects - of manufacturing and production, design in the post-modern age had to engage with the cultural dimension. Thus, while the earlier designer needed to create a shoe that was comfortable, ergonomically designed and catered to some 'universal aesthetics' for shoes, the post-modern designer working for a multi-national shoe manufacturer, had to include an understanding of the cultural aspects in product semantics. If the modernist had great faith in the universality of "good design", the post-modernist understood that the global age had to temper itself with an understanding of cultural diversity. Thus, a designer no longer regarded design as a set of objective parameters that had to be optimized, but an effort that had to take into account the experience of various users and ensure that it had meaning.

This paper suggests that even a paradigmatic shift from the material to the cultural would fall short when it comes to understand the deeper basis of some of the crucial problems that shall confront future societies. The designed response would necessarily have to go beyond the cultural dimension and engage with the self in a far more introspective manner. In this regard, designers may learn from approaches that engage more directly with the human spirit and the human psyche.

Programmed as we are, to validate and to justify our own positions, we often regard the negation of the other as a corollary of our own beliefs. To transcend such dualism and examine what appear to us as chaotic and disordered, would bring us closer to what is. However, given our morality and ethics; our sense of right and wrong, good and evil - to transform ourselves to regarding the universe and all it contains as one essential continuum, is not only immensely difficult, but might even appear undesirable.

The Buddha began his inquiry into the nature of human suffering, over two thousand and six hundred years ago. He concluded was that the world came into existence because of desire. While existence, did yield its pleasures, it also yielded pain and suffering. The Buddha concluded that the cessation of desire, led to the cessation of existence; and to the salvation

[31] A co-operative form of human society existed formerly in the shape of a commune; but the restoration of the commune as a unit would imply practically the return to the old city-state, and as this is not now possible with the larger groupings and the greater complexities of modern life, the socialist idea could only be realized through the rigourously organized national State.
Sri Aurobindo, The Human Cycle, Pondicherry, SABDA, The United States of Europe, p. 325.

from the endless cycles of ignorant meanderings. Such an emergence out of ignorance, led to awareness, that was beyond dualities.

Finally, the paper attempts to introduce ways of seeing that suggest the limitations of rational thought. The invisible shades of disorder have a beauty that is beyond the beautiful; perhaps, these are shades that one can at best allude to, much in the manner of Wittgenstein's silences, or in the utterances of sages who dwell in the invisible shades of disorder[32].

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WITTGENSTEIN LUDWIG, 2001. Tractatus Logico Philosophicus, Routledge

[32] The notion of dancing with disorder, is symbolized in the Hindu view of the cosmos by the dancing Nataraja. Nataraja, who is also the Lord Shiva - the God of Destruction (of ignorance) has matted locks swaying as he dances the tandava - the cosmic dance of chaos; his face poised and calm. Encircled by a ring of fire that symbolizes the trials and tribulations of life, he dances with an equanimity suffused with a smile suggesting his victory over the powers of ignorance. One also encounters the image of Goddess Tara in a similar dance.
A detailed study of this may be found in the work 'The Dance of Shiva' by the eminent art critic, Ananda Coomaraswamy.

REPRESENTING DISASTER: SIGNIFICANCE OF DESIGN IN COMMUNICATING SOCIAL RESPONSIBILITY

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Abstract

This paper is about a textbook that aims to teach children of 11-13 years of age how to deal with or prevent disasters in general. The title of the book is *I am Learning How to Live Safely*[1] and it is sponsored by the Red Cross and Crescent. The group of experts who wrote and prepared this book consisted of a professor of meteorological engineering, a professor of social psychology, an education specialist, and two designers.

As a general decision of the group, the term "disaster" is avoided in the title deliberately, because the term disaster implies a fate/destiny oriented world view. For that reason, disaster is defined as an outcome of a natural phenomenon whose effects can be altered positively by precautions or simply by being prepared and informed. Therefore, rather than a passive point of view and/or general attitude, a more "positive" and "active" stand is tried to be conveyed and encouraged. Instead of pronouncing "disaster", the idea of "safe living" is prioritized.

We will be discussing particularly about the writing and designing process of this book in the paper, because the designers worked with the other members of the group from the beginning of the process and the analytic and systematic thinking of designers affected the text itself and the whole layout.

Apart from this structural intervention, the second effect of the designerly contribution to such a critical theme is the problem of representation of these abstract notions related with this "safe living" attitude about disaster. There are two kinds of representation or abstraction is conducted in the book. First one is the representation of the physical and natural incidents. Second one is the representation of the desired behaviours/attitudes of children/people who will read the book.

While the concepts are represented, by the help of visuality, children are encouraged to behave in an active, realistic and positive manner towards the natural facts. As a method to help develop such a behaviour change in children, role models are provided who are the main characters of the book that it is hoped, the children will identify with.

Introduction

Unlike many other textbooks, *I am Learning How to Live Safely* is a collectively written book. The book is the outcome of a project proposed to and accepted as an educational material by the Ministry of Education in Turkey. Apart form the fact that there are three writers, there was a working group whose members are of different expertises along with the designers. There were meetings in which the written text is being discussed by the group where experts on disaster management, education and social psychology

[1] Kadıoğlu, Mikdat, İpek Gürkaynak ve Alp Boydak. Kızılay ile Güvenli Yaşamı Öğreniyorum: 5. ve 6. Sınıflar için. Ankara: Yorum Bas. Yay. San. Ltd. Şti., 2004. The book can be downloaded online at http://www.kizilay.org.tr/index.php?menu1=79. Along with this book a teacher's book is written aiming to tell the teachers how they may use this book as an effective educational material in class.

handled the text at certain key points with the members of the Red Crescent (Kızılay). These discussions were informative for the designers to being able to have full grasp of the concepts and the information that the book covered. The phenomena of "living safely" is first discussed and absorbed by the group members.

Usually, designers are not part of the writing process of a book. They are often handed with a final or semi-final text to be designed in a format of a book, leaflet, etc... They try to visualize the information or put it in an order of hierarchy after the text is being produced. This time the designers played a key role in the formation of the text.

The contribution of the designers (apart from the book size, paper, general style & layout, font size, spacing and colors) can be summed under the headings of:

1. the introduction of the elements of "fire, water, air and earth" in the abstraction of different disasters.
2. the introduction of 3 phases of the disasters: before; during and after. Each disaster is explained according to these 3 time phases, so that the things that could be done is classified in line with the course of events. (This also gave a three dimensional understanding of the disasters, as it were, each student can relate him/herself.)
3. the introduction of two characters: *Aykız* and *Aycan* as role models to represent the kind of behaviours that the students should be in during these time phases.
4. the introduction of the book is written by the designers along with the writers to explain the abstractions of the disasters and the two characters.

Representing disasters by the elements of "fire, water, air and earth"

A concept is the backbone of every design. It is the core that holds and binds the different elements together in a certain order and harmony. Starting the design of this book, the designers first had to understand what "disaster" meant and then they came up ways of representing them.

Disaster, in our book is defined as the specific situations where the local sources are not sufficient enough to handle the bad effects of any kind of threats on life, property, environment, economy and cultural entities. When natural phenomena like earthquakes or floods cause significant life and property losses to demand country wide or international help, then they are named as natural disasters (Kadıoğlu et al 2004, 10).

When we are talking about disasters, they can either be natural or artificial, but what is common to most of them is that they denote a certain outrage of which is considered as normal. So, a disaster, in these terms could be defined as the negative side effects of changing of a normal situation to an abnormal state, caused by natural or artificial reasons and that can not be dealt with what is at hand. For example, flood can be seen as an outrage of the natural movement of water. Similarly, fire can be seen as an uncontrolled spread of flames. Storm is the extreme movements of air flows caused by mostly differences of pressures. Earthquake is the result of the resolving of the tension that pieces of land exert on each other.

Each of the threats that we have mentioned above can lead to natural disasters. All these natural disasters have something in common that they are all triggered by the gradual or sudden changes in the "primary elements". These primary elements are fire, water, air and earth[2]. Although having traces in many

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[2] The complexity of the world view in which the primary elements have their places deserve full quotations. Below you can find hints of the wider circle of thought that these elements belong to (emphasis added to all quotations):
"Since antiquity prime matter has enjoyed a hallowed place in the Aristotelian system. That system displays an awesome completeness, with God (pure form and actuality) at the top and prime matter (pure matter and potentiality) at the bottom. And between these two pole matter and form combine to yield physical objects of lesser or greater perfection. At the bottom of the scale are the four elements, which are mainly material; then come simple uniform stuffs, like the metals; further up the scale are plants, the simplest living things; then appear the various animals, crowned by man; higher still are the heavenly bodies, whose potentiality is so weakened as to humble them only to local circular movement without risk of destruction. At the very top is the Prime Mover, God, who is wholly immune to the commotion of the physical bodies below (Gill 1989, 42)."
"Aristotle suggests that each element can be transformed into the one adjacent to it by this first easy mechanism: air results from fire, water from air, earth form water, and fire from earth. The transformation is cyclical. Although he describes the cycle as occurring in a single direction, he later indicates that the cycle can occur in the other direction, for he mentions the emergence of air from water and of fire from air... since adjacent elements have one feature in common and one opposed (Gill 1989, 73)."
"In On Generation and Corruption II.3 Aristotle says that fire is hot and dry, air hot and wet, water cold and wet, and earth cold and dry (Gill 1989, 44)."

different cultures all around the world, like the Chinese, Indian or even Australian cosmologies; the conception of primary or classical elements can be linked to ancient Greece to the accounts of the terms by Aristotle.

> ....there is one physical element which makes up the system of the bodies that move in a circle and besides this four bodies owing their existence to the four principles, the motion of these latter bodies being of two kinds: either from the centre or to the centre. These four bodies are **fire, air, water, earth**. Fire occupies the highest place among them all, earth the lowest, and two elements correspond to these in their relation to one another, air being nearest to fire, water to earth. The whole world surrounding the earth, then, the affections of which are our subject, is made up of these bodies (Aristotle 2004, 3).

This basic premise was the starting point of the concept of the design of the book. If threats and consequently disasters are caused by the changes in the primary elements, then safe living would be the state where each element works together in a harmonious unity.

Following this line of thought, designers first classified the natural phenomena that are listed in the book which are: Earthquake; fire; winds and wind storms; snow storms and avalanches; precipitation with lightnings; landslide and mud flows; sun and hot air flows; according to their relation to a certain primary element.

Every primary element is represented by a designed icon and a certain color assigned to it. For example, earth is assigned to orange (because of its adjacency to brown), whereas air to blue; water to green and fire to, obviously red.

The icons are chosen to be circular containing the basic elements. They are designed in such a way that the idea of being out of control or breaking the boundaries is given as if the contained primary elements are breaking their circles and coming out dangerously (Figure 1).

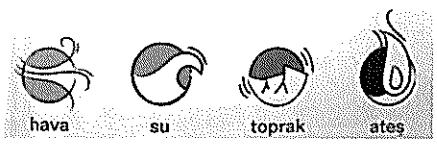


Figure 1. Icons of primary elements of air, water, earth and fire.

Unlike the icons of the primary elements, the icon for representing "safe living" is a self-content circle, consisting of these four elements that reside in it harmoniously, forming a whole (Figure 2).

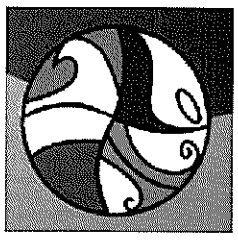


Figure 2. Icon of "safe living" combining the four primary elements.

During the process of designing and learning about the disasters, what was really interesting is to discover the different cosmologies and beliefs, each culture assigned to these natural phenomena. As these events change and affect quite a number of people's lives in a considerably negative ways, and the causes are mostly unexplainable, they are associated with a higher "force" beyond or sometimes underneath. For example, in Japanese mythology it is believed that big tides are caused by a giant fish living under the sea or an Indian mythology says that earthquakes are caused by the movements of a great elephant's head on which the earth resides. In Turkish mythology or folk culture, it is believed that the world resides on the horns of an ox of which the movements of it cause the earthquakes. Implying this belief, on the cover of the book, the icon for safe living showing the four basic elements in a harmonious circle, representing the earth is held by a child whose arms resemble that of the horns of the ox (Figure 3).



Figure 3. Cover of the book.

The general layout of the book is designed in an order that each chapter starts with a page of introduction having the color of a primary element and the contents of that special section (Figure 4). Then definitions and explanations are the first to take place after the colored introduction page. To enable ease of identification and to mark their difference form the main text, activities and games are bracketed having the same color coding of the primary element they belong to and differentiated by different icons. The same design language is applied to these icons as well to maintain the coherence. The circle divided into four sections enabled to give the sense of action, play and collectivity (Figure 5).

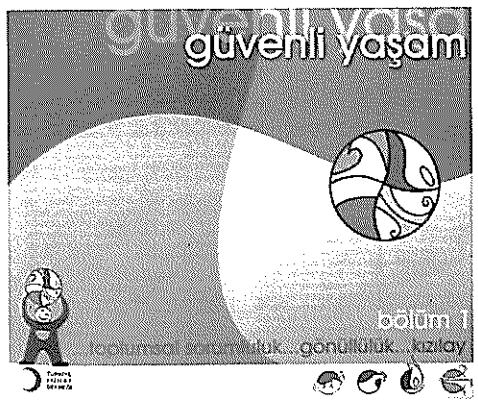


Figure 4. Chapter introduction page.

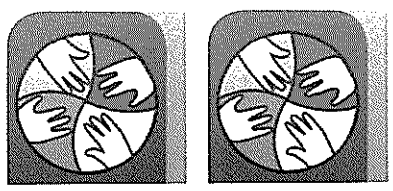


Figure 5. Icons for activities and games.

Representing the reader through role models

> Unless your world is really only a chatroom, it's going to give players something to do. The things that you give them to do, and the rewards they ean for doing it, constitute the *world model*. We don't mean this in the genre sense of "killing monsters" versus "battling enemy spacecraft," but rather in the sense of how the world wants the player to live and grow in it (Rollings and Adams, 2003).

In theories concerning computer and video game design there is this concept of "world model". The world model suggests the player to do certain tasks in certain ways and help the players to "grow and live in it". According to the famous game designer Raph Koster, there are five different world models: scavenger model; social model; dungeons and dragons model; player-versus-player model; builder model (Rollings and Adams, 2003).

Obviously, it is not the aim of this paper to go deep into these specific categories of world models, but during the process of writing/designing, it was quite clear that one of the primary objectives of the book was to give the 5th and 6th grade students that they can "do something" against these "monstrous threats", as it were. So, it is decided that visual role models were necessary in conveying the essential visual information on how to act in every stage of being exposed to dangerous situations, like staying down/crawling when there is smoke etc...

Two role models were created by the designers (Figure 6). One boy named *Aycan* and one girl named *Aykız*. The names were chosen in accordance with their implications to Red Crescent (Kızıl**ay**), both starting with the word/syllabus "ay". Both of the characters' hair is in the shape of a crescent. They are depicted as wearing everyday clothes, not special uniforms, because if they did wear special uniforms, then it could be thought that the acts that the two characters are describing are to be conducted by a specifically educated group of people, like *AKUT* (Search and Rescue Team of Turkey).

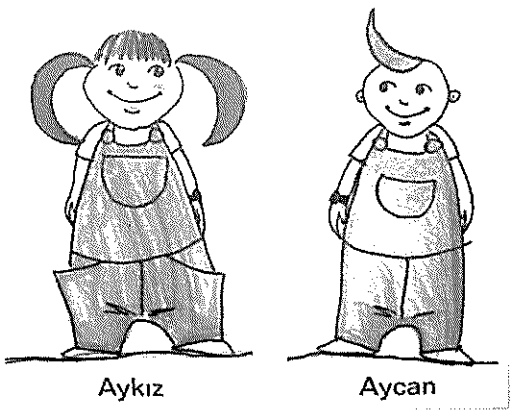


Figure 6. Role models: *Aykız* and *Aycan*.

On the contrary, the message of the book is to enable the student/reader's identification with the characters and develop similar behavior patterns as ordinary students without any special skills or education. Just like the world models in computer or video games, both by the textual and visual discourse within the book, the world is represented as a place where it is normal to confront the natural phenomena causing disasters, but it is possible to act against them and be prepared beforehand. The message is to create a social awareness and consequently activate the students to inform themselves about various phases of the threats and also let others be informed. The student/reader is rewarded by playing the different games and taking part in the activities, sometimes involving other parties, such as their parents and other people where they live.

Three phases of the disasters: Before; during and after

According to our book, there are threats, risks and disasters. Threats are the natural or man-made events that could cause life and property losses or prevent to sustain our everyday lives, if not taken precautions. Among the threats earthquakes, floods, storms, fires and explosions could be counted. It is not always possible to prevent the threats that trigger natural disasters. For example, geologically, Turkey is on a major fault line and we can not do anything to change this and we can not prevent earthquakes to happen, but we can reduce the harm that an earthquake can cause (Kadıoğlu et al 2004, 10).

Risks are the bad consequences of a threat can produce. These consequences can affect the lives, houses of the inhabitants of our surrounding and the things that they do directly or indirectly. The risks can be reduced (Kadıoğlu et al., 2004, 10).

As there are known threats whose risks can be reduced, there are quite a number of things that could be done before they can turn into disasters, or even after. That is why the designers suggested classifying the information and related activities into time phases like "before", "during" and "after". This enabled to put the related topics and necessary information in an order. Visually, it enabled an ease in reading as there is quite a number of topics suggested to be done in each of these phases.

Conclusion and last words on design and social responsibility

"Safe living" which is put in contrast to the term of "disaster" in the aforementioned book means "to try to live avoiding the harms that could be brought by all kinds of danger." This is a delicate subject especially if children are being addressed as a target audience of a book related to disasters, so designers had the responsibility of not creating a "dooms day" image. Therefore, illustrations were chosen as the mode of representation of both the disastrous situations and the related actions advised to be done before, during and after them. The real life situations are depicted as close to reality as possible, because it was demanded to be informative, while it was avoided the scenes to be frightening. Illustrations also gave the freedom to underline or highlight the real message enabling the designer to eliminate all the unnecessary details. The power of abstraction is useful in both communicating with children visually and conveying what is really important visually (Figure 7).

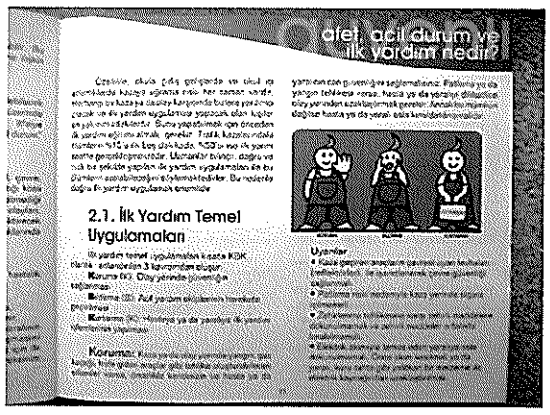


Figure 7. Detail of a page of the book with an illustration related to first aid.

The whole book is written by addressing the things that anybody could do according to his/her current capabilities. Conveying information is sometimes enabled by addressing the students' parents, neighbors or local authorities: The student is asked to get information or to seek help from them when needed. This kind of an interaction would enable people to talk about certain safety issues around them and to take precautions. For example, there are activities such as

"Preparing a Family Disaster Plan" (Figure 8) or there are many warnings in the book such as "Tell your parents not to... (go through the flood water with their cars)" kind of statements trying to educate families, especially who are living in rural areas.

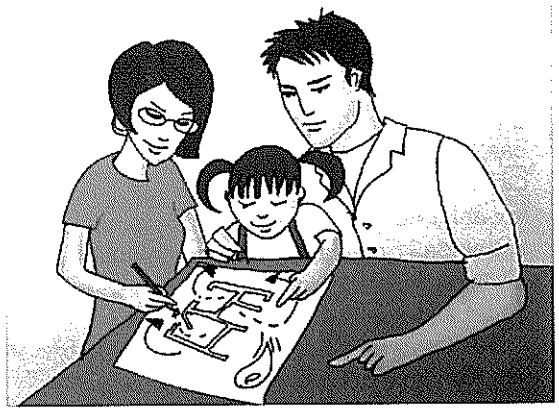


Figure 8. Illustration showing the family disaster plan.

It was one of the major goals of the book to give the sense of "being active". This kind of conception covers to being "active, sensible and be informed" in order to maintain a safe living standard.

Design of the book was really important to convey the intended messages and trigger the type of response form the part of its readers, because graphic design mostly aims communicating the right message. Designers aimed to be part of this social responsibility project by making the book:

- more readable in terms of putting the information in a both visual and textual hierarchy,
- more reader-friendly by introducing active role models that children can identify themselves with,
- more manageable in terms of the significant amount of textual information.

The last topic is probably is one of the most important ones, because if the information is made manageable by the tools of basic design, like hierarchy, color coding, icons, etc, then it means that there is the possibility for the student/reader to think that disasters, threats or risks are also manageable to a certain degree. Design in this case, and similarly in most others, is not only a cosmetic make-up on an important piece of text. Especially for children and especially as part of an education that aims to beyond educating children. Through those children, this vital information can be disseminated to many people who might not have the access.

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DOES COLOR DRIFT DESIGN TO DISASTER?

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Abstract

Color, which is in our perception, is an outstanding design element playing an important role in our happy and healthy lives, as well as in the decisions of design process. Intention of design is the determining cause for usage of color in which cases and how. So putting forward the intention of design and appreciating the supportive qualities of colors become vital in color decision. Within this frame, in this paper, it is intended to express the qualities of colors required to be considered, as well as to draw attention to the interior designs that could be drifted to a disaster by the effects caused by them. "Disaster" is used to point out the application in which the qualitative characteristics of color and purpose of design are not considered and consequently successful design is evaluated to be unsuccessful.

In this paper the color applications will be discussed by illustrating some interior design samples.

Introduction

Colors seem to us with some meanings as a way of expression. Even they do not sound anything obviously, those affect us spiritually. For that reason, designs considering psychological interactions created by colors used in an interior give positive impressions. On the contrary, colors which were not chosen truly may cause not only a negative impression but also a good design work can be drifted to a disaster. Not to create a disaster during the design procedure, the color harmonization methods should be used considering the qualitative characteristics of colors and the issues about how they interact and affect each other.

QUALITATIVE CHARACTERISTICS OF COLORS

While defining a color, it is required to know some basic concepts about colors. Through these concepts, we can totally delineate each color that we perceive. So to pronounce the name of color is not enough for its definition. For instance, by enouncing the word "red" we can not literally explain that color. We have to describe and explain what kind of red it is. For an exact description of that color we should identify whether it is dark-light, bright-pale, its warmth and cool, its middle values between dark and light shades, and the different values of bright or mat shades of it.

Three main color attributes-hue, value, and saturation-together can be used to determine any individual color visible to the human eye.

> The attribute of color experienced first in the course of human development is hue. Hue is sometimes described as the primary character, or the pure essence, of color. It refers to the wavelength of the color and its relative position in a two-dimensional color – in other words, the redness, yellowness, or blueness of the color (Kopcz 2004:4).
> Value is the term used to describe how light or dark a color is. When two colors differ in terms of their relative lightness or darkness, they are of different values. Traditionally speaking, the lighter the color, the higher its value. However, differences in value are also visible between dissimilar hues. For example, it's easy to recognize that a cream-colored wall (of yellow hue) has a higher value than the color of an adjacent mahogany door (which has a red hue) (Kopcz 2004:5)

Saturation refers to the amount of hue, or the degree of fullness of the hue, that exists in a color. To reduce the saturation level of any color, it can be mixed either with a gray equal in value to the original hue or with the complement of the original color. The word intensity is another term used to describe the relative proportion of hue saturation versus neutrality as it exists in color. A very intense color is one closer to a full hue. When we decrease the intensity of a color, only its saturation is reduced (Kopcz 2004:6).

Colors are classified into two groups according to their psychological impacts on human.

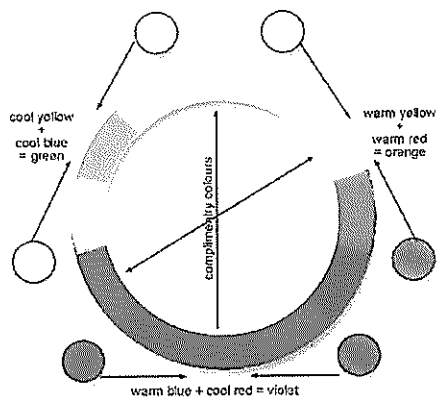


Figure1. Warm and Cool Colors.
(http://www.johnlovett.com/colour.htm)

Most colorist accept the idea that humans associate temperature with certain hues. Hues in the yellow, orange, and red range are considered warm, while colors ranging from blue to green are considered cool. Yellow-green and violet can seem either warm or cool depending on the relative temperature of the adjacent colors in view. In spatial application, we tend to favor warm colors in colder climates and cool ones in hot climates (Kopcz 2004:9).

Due to the standing out characteristics of some colors, having a dashing appearance and making feel excitement, they are called as warm colors. Because the wavelengths of warm colors are short and high resonant, they are the first colors reaching to retina. While red and all colors merging to red are the warm ones, green, blue-purple and colors merging to blue are composed of cool colors. But each hue has warm and cool shades. For example, if there is more red in green, it is called as warm green; on the other hand it is called as cool green, if it consists of much more blue. Besides, the warmness and coolness ratios of color changes also increase or decrease according to values of colors. Colors merging to white or black are perceived as much cooler than their saturated tones. For instance, pink is a warm color, but saturated red is perceived much warmer. In summary, each color has both warm and cool quality. The tones merging to cool colors are called as cool shade of that color, the ones merging to warm colors called as warm shade of that.

IMPACT OF COLOR ON INTERIOR DESIGN

The impact of the color on perception of the interior has a very strong relationship with the psychological impacts on human. Red is a good and explanatory example, as the most dynamic color having a most acute resonance. Red, as a descriptive tool, appears with some meanings as a reflection of emotions. Even if these meanings do not always sound anything obviously, they affect us emotionally. So red used in interior design creates an emotional state, exposes the psychological interactions. Red is sometime a rose, a traditional expression of pure love. But noticing red may also mean loosing control. Although it is a positive color, it is the color of life, that red, the same one, is sometimes used as identification of murderous and violent institutions in subconscious, as well as the battles arise as a result of greed, ambition and anger. Red is known as the color of chaos, and unless it is composed of convenient tones and proportions of red color, it may cause chaos in the interior. The implementations which do not consider the qualitative characteristics of colors may drift a good design to a design disaster and cause negative emotions (Figure 2).

The red color used in a space expects to be conspicuous. Usage of red as an idea in design lay outs a red blooded and dashing attitude. However, in the spaces expected to be in tranquility, it entertains a risk to use so much kind of colorful tones of red due to its potential. The most important thing here is to create an atmosphere corresponding to the intention and the way of expression. This could be formed by dominating the red

which undertook the task, and also by deriving benefit from the quantity of red and using it only one touch (on an object, a furniture, etc.) (Figure 3-4).

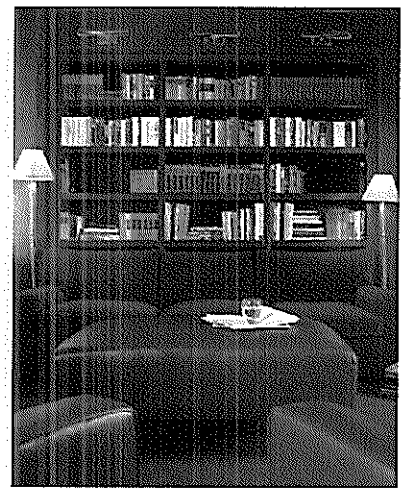


Figure 2. The use of same value of one color in an ample space cause chaos because of the quality of red, as well as interfere the perceiving of the measures and the depth of space (Clifton 2001:57).

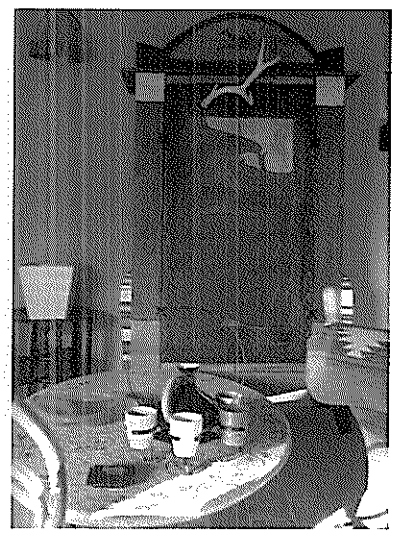


Figure 3. The harmony composed of opposite colors red-green and orange-blue. The red which has dynamic quality has taken a part in a small (restricted) area; the passage toward orange merging to red has provided the harmony (Rinaldi and Tashen, 1998:283).



Figure 4. Dominancy acquired by only one touch, due to the quality of red color (Clifton 2001:50).

THE CONFLICT IN SYNERGY OF COLORS WITH DIFFERENT QUALITIES

By the use of warm and cool colors together, which may create a color clash in the space, even a successful design procedure may result as a disaster. Avoiding from this can be possible by using the warm tones of cool colors in the harmony in which the warm colors are dominant or vice versa (Figure 5).

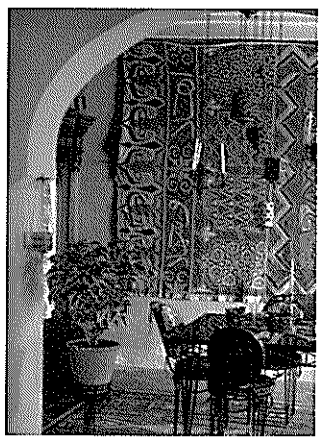


Figure 5. Due to that a cool color got hold the other warm colors, the warm and cool colors harmony has been created. In the wide space the warm tone of blue has been used, and it has been provided that by decreasing the saturation of warm and cool ones the colors were made come closer to each other. Here the patched extent of colors and their location within the space contributes to balance and harmony among them (Lovatt-Smith and Muthesius 1996:268).

For instance, we can convert the green into a warm green by adding some red, a green merging to brown. On the contrary in the harmony in which the cool colors are dominant, for example by adding blue in the purple, we can get the cool shade of that color. The coolness or warmth of colors increase or decrease also, according to the changes in the values of colors. Therefore, by adding black or white, the tones of colors become much cooler rather than their saturated tones. For example, the pink in which white is added is a warm color, but the red in the sun spectrum (color chart) is warm and much more attractive color rather than it. The way of our perception of color also depends on which colors are used together and next to each other within the space. The warm or cool shade of one color which is put next to another warm or cool color change increasingly or decreasingly according to its hue, value and saturation. In order not to create disaster in the design of use together of warm and cool colors, the color harmony can be achieved by using the warm tones of cool colors or the cool tones of warm colors. Also by using passage colors composed of the other intermediate colors, it is provided that the colors visually come closer and are harmonic to each other (Figure 6).

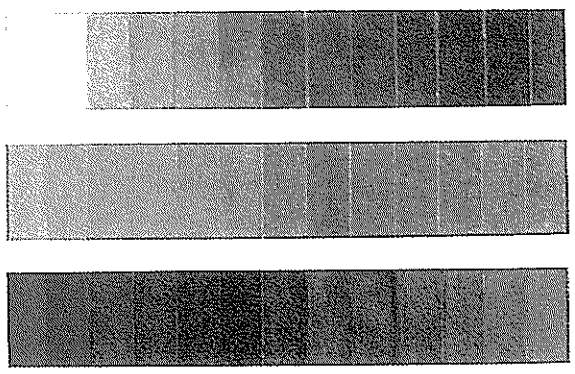


Figure 6. Color passage samples. Colors, like the adjacent colors may undergo a change little by little. Such as red, red-purple, purple, blue-purple, blue, or red, red-orange, orange, yellow-orange, yellow.

The color passage can be used in the case that an object is not desired to be seem obviously. If it has a characteristic of contrast hue and saturation, it can also be used for easing this contrast and establishing transition links. By color passage a relaxing atmosphere can be created, which is much less risky and much more acceptable. It is not always possible to achieve a harmony in color contrast, whereas it can be ensured by using color passage.

The complementary hues, because of that they do not like each other not at all and form opposite poles, cause shock effect on eyes. So, in the harmonies composed of complementary hues, a contribution between colors to each other is provided, and by using the intermediate colors a passage is done. When the complementary colors are used together at the same proportions, they invigorate each other. Therefore the affection of hues is got to be under control by using the colors with different proportions, saturation and darkness. Particularly when the part wanted to be attractive within the space – whether it is furniture or an object – is saturated and small, you come much closer to your intention (Figure 7).

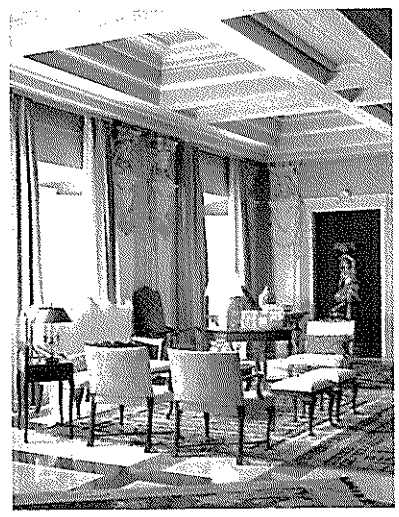


Figure 7. "The colorful harmony made by the complementary green and red". The dynamic characteristic of the warm color red was balanced by using it patched in a small area, and the harmony was formed by using the cool color green unsaturated in a widen extent. The harmony among the colors was formed by using the white – a mid-passage color – on the frame, the curtain, the armchair and the ceiling (Rinaldi and Tashen 1998:36).

While using one of the hues together with its complementary hue, sometimes some other ways could be preferred in order to provide harmonic success in design, due to the deep mutual interaction of them. The most preferred method is

reducing the saturation of chosen colors; for example using full saturated positions of leaf green and scarlet orange together side by side may be abrasive. Their mutual interaction can be more harmonically by adding into them some grey color or another hue (for example blue). Another method is adding the colors into each other; for example because of that the red and the green with the same value have also the same level of saturation, they can disturb the eyes. This problem can be overcomed by adding the colors into each other. Thereby, the interaction can be less drastic (Figure 8).

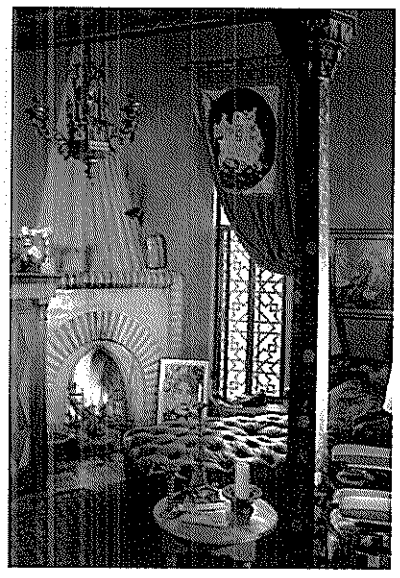


Figure 8. "The harmony made by the complementary hues green-red and orange-blue". The red as a color with dynamic quality was used in a restricted part, and a harmony was provided by making a transition (passage) with orange merging to red (Lovatt-Smith and Muthesius 1996:155).

One of the factors determining the decision of color is the atmosphere intended to be created by the designer. For example, the atmosphere created by revealing the visual expression of exposed concrete within the interior can not be attained by coloring the concrete within the same place (Figure 9). Moreover, coloring the exposed concrete within an interior space where prestige and power are overemphasized could cause a disaster in design. However, in such a design case that furniture made by color and smoothing application over light concrete the result may not be a disaster (Figure 10).

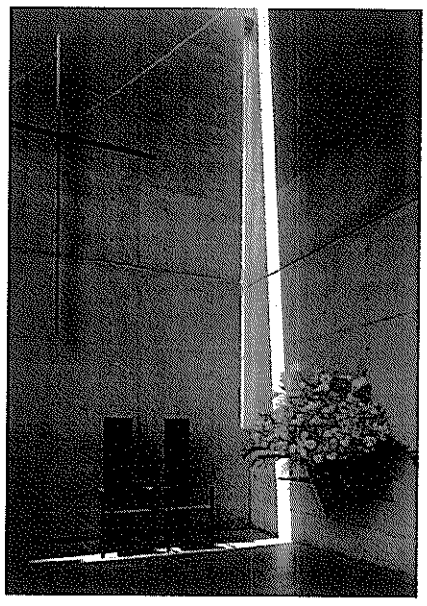


Figure 9. The marvelous expression of exposed concrete in the interior. Designed by Tadao Ando, 1990 (Ando 1991:108).

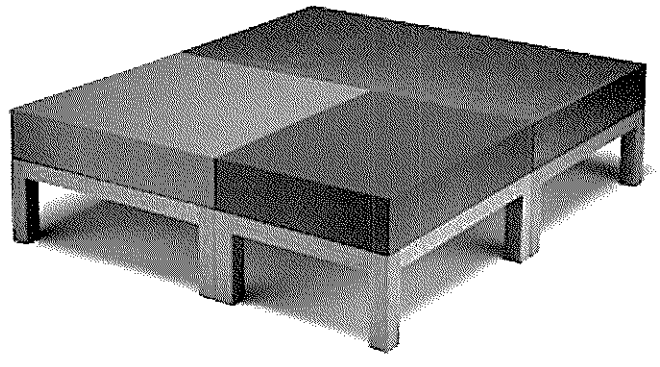


Figure 10. The furniture made by light concrete modules. The bearing part is natural wood. On the concrete convenient for coloring surface (Sandback Fabrication Katalog 1999).

In each application the concrete have been used, but the application made in the interior the natural character of material has been emphasized; on the other hand in the furniture design while the natural character of material was being masked, its chrominance character has been highlighted. The use of concrete has been differing in each of two designs according to intentions of them. Therefore, the color has an

importance as a factor affecting the conclusion intended to be arrived by the designer.

CONCLUSION

In order not to cause a disaster in a well-designed space, considering the mood intended to be created, the colors are limited according to their hues and quantity. Also, beside this limitation, the allocation of colors is determined within the space. For formation of a harmonic scheme in the space, a balance among colors is provided. The allocations of hues selected, of lightness-darkness, and of saturated-unsaturated colors and their local impressions are important factors in contribution of color to the space.

The designer, together with his/her emotions, applies color harmony methods considering the physical characteristics of colors as well as how they interact with each other due to their own qualities. The designers do not only act according to their subconscious background, but they are also required to have scientific background for description of colors. The aesthetic and scientific background of a designer about colors do play an important role in positive contribution of color to interior design.

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FIGHTS AND FIRES ARE THE FLOWERS OF EDO

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Abstract

It has been common in post –enlightenment Western society to view binary pairs as oppositional in nature. I wish to interrogate how the narratives of our society determine our evaluation and response to disaster and events that create disorder in our lives. What is the role of design when cities, which are re-built and re-constructed after "disaster", natural and man-made, alters the material and physical "face" of the urban environment? By changing our relationship to binary pairs from oppositional can we transform the design and inhabitation of the urban landscape? This is an environment that is increasingly perceived, particularly by Western thought, as alienating, hostile and sterile?

The locus of my research is the city of Tokyo, and how it has transitioned from the Edo of the Tokugawa Regime 1600-1863. This was a city with a built materiality of wood and paper, which through repeated destruction, has re-emerged as contemporary Tokyo, a city of concrete and glass. This will be illustrated by the way firstly, in which the various "mappings" of the urban environment are a visual expression of its metaphysics and secondly, by how they underpin urban planning and design. "Fights and Fires are the Flowers of Edo" is an expression that was popular during the Tokugawa Regime. This period was a time of constant conflagration and upheaval as the result of repeated earthquakes. More recently events have included flooding and firebombing. However this upheaval always preceded a resurgence of life. The term "Fights and Fires are the Flowers of Edo" is indicative of the process of renewal and creation as an integral part of destruction. This paper specifically examines the way in which narratives, written, oral and visual determine our relationship to binaries and the way in which they provide the conceptual framework for design and urban planning. The paper will also interrogate whether these narratives of resilience have permeated the new materiality of concrete and glass. The conclusion will demonstrate the consequences this has for design and urban planning.

The theoretical perspectives that this paper calls on are the interface of science and metaphysics through the Poetics of Space as significant for meaningful inhabitation within the Built Environment. The organizing principle of this multi disciplinary approach will employ Narrative Inquiry to examine the role myths; cosmologies, maps and metaphysics of Japanese Culture play in the design and re-construction of the Urban Environment.

It has been common in post–enlightenment Western society to view binary pairs as oppositional in nature rather than as complementary.

Thus our definition of what constitutes order and disorder is polarized. Traditionally, the Western view has been to privilege control and safety, careless of the implications to the psyche. Visual narratives and metaphors of boundary and protection are evident from earliest times in stonewalls that surround our cities. Post–enlightenment, our obsession with order and control, shielding us from the natural world is even more evident in the grid of rationality imposed on the urban environment. However, despite the welcoming advantages of increased safety and protection the price appears to be a built environment that is increasingly perceived, as alienating, hostile and sterile.

But there are many who hold an alternate position redolent with possibility. In "The Poetics of Space", Gaston Bachelard reveals that the need to dream and imagine is critical to being and habitation (Bachelard and Jolas, 1994). He takes us on a poetic journey of spatial and metaphysical discovery. From

bounded protection in burrows and shelters, he introduces us to the nest, simultaneously our symbol of shelter and utterly fragile thing, affirming a space that integrates rather than resists a larger cosmos.

James Donald, in "Imagining the Modern City "(1999) also challenges the Western view of dialectics as oppositional, re-iterates the need to dissolve fixed boundaries of "either/ or" as a necessary condition for enlivening the cities that we inhabit. The realm of physical and metaphorical light and dark, the 'so-called' problematic areas of urban existence inherent in the city can be, he suggests the means by which the city comes alive. By enlisting as his guides, filmmakers, novelists and poets to penetrate and observe the urban experience Donald offers a complement to the reality purported by our sociologists, architects and urban planners and demonstrates that the love of 'universal transparency' is in fact the 'Enlightenment terror of darkened spaces'. The result of this tightening and fixing of the lines between reality and imagination is a loss of a space where our dreams and imagination can access possibility and potential (Donald, 1999).

The locus of my research is Tokyo.

It is a labyrinthine city often perceived by Westerners as confusing and paradoxical. However, does this facilitate a space where an alternate response to the problematic areas of urban existence can exist? This is a city that traditionally has demonstrated an alternate order or "mapping" that is conducive to resilience, flexibility and renewal. Behind Tokyo's apparent ugliness and chaotic disorder, behind the contemporary façade with and its business and administrative faces lie very different and parallel realities. In the spirit of Calvino's "Invisible Cities", Tokyo too, with its faces and masks is simultaneously many different cities and villages each with their own rhythm and pace (Calvino, 1978). Peeping through gaps in the contemporary fabric old rhythms, memories and traditions of earlier eras co-exist creating a vital, living integrated whole. Architectural theorist Yoshinobu Ashihara (Ashihara and Riggs, 1989) refers to this as 'a hidden order'. Likewise Hiddenobu Jinnai (1995) sees a city where a contemporary international surface co-exists with the vernacular, an order where surface (Omote) and underside (Ura) are in a complementary relationship to each other. This order would remain invisible to outsiders if the underlying 'organic ties to nature and the universe, is not understood' Jinnai argues (Jinnai, 1995). He adds that the development of the city is a continuum in which the memory of a cosmology based on a complementary relationship with nature is still in existence and is structured into the very pattern of the city. Tokyo bespeaks a gestalt. At night material surfaces, whole buildings and the rigidity of the street plan of the rational world dissolve, giving way to an alternate unrecognisable world of play where darkness, the irrational and the mysterious are privileged and warmth, liberation and conviviality are the norms. *Honne*, corresponding to the private self or the real situation, is in evidence. In the morning, the city returns to rational, efficient management and *Tatemae* or public face become the accepted norm. Despite a seemingly Western and International 'Face' the city of Tokyo in its diurnal and annual rhythms is 'Dancing' to its own internal order, exuding a vibrant energy and life force.

William Demastes in his book "Theatre of Chaos" offers the solution "To be and not to be. That is the question?" to the problem posed by Hamlet, when troubled by the dichotomy of rationalism implied in the expression, "To be or not to be." This metaphysical speculation is within the tradition of the Japanese Buddhist Scholar Daisuke Suzuki. How would the evolution of Western thought been altered, Demastes posits if we had embraced dichotomy as a way of experiencing and apprehending reality rather than setting possibilities in opposition to each other. Shakespeare, Demastes explains, was writing within the transition from a medieval sensibility and worldview in which,

> The mystery of life that prevailed in the medieval world placed humanity in awe of nature, in fear of its unpredictability. The rise of reductive, predictive rationalism initiated a conflict between humanity and nature, with humanity trusting this new tool ultimately to assist in the human triumph over nature.
>
> (Demastes, 1998)

Faced with impending ecological crisis this conflict between humans and nature need reconciling. The topic proposed for this conference "Dancing with Disorder" is a valuable and essential step to addressing this perceived opposition.

To do this I am adopting Tokyo as a case study, a city with a history of constant conflagration and upheaval as the result of repeated earthquakes, flooding and firebombing. However this upheaval always preceded a resurgence of life. Can we redefine what we interpret as disorder by looking at underlying hidden patterns of order and rhythm, which are not always apparent to a society bent on rationalism and its controlling ethos? Rather than imposing our own conditions for order can listening to earlier rhythms, often discredited as irrational and belonging to the realm of the superstitious provide the impetus for re-newel and re-building. William Demastes argues that a vision of chaos is not new,

> What is new is that our new twentieth prophets – those men and women whom we trust rationally and empirically to describe truth and reality and whom we call scientists- are validating for us ... the visions of lunatics, lovers, and poets. They are recovering ideas from the marginalized realms of culture and placing them once again on centre stage. This time the ideas are supported not by magic and mystery but by the very sciences that once relegated them to the margins (Demastes, 1998).

F. David Peat (1991) also espouses a simultaneous vision of science and metaphysics using maps as an heuristic to expose some of our most formative visual narratives. Descartes' grid of control and order, while useful in locating our position in space has separated us, from each other, the natural environment and also the cosmos itself. He advocates a re-animation of the Cartesian maps that while useful for their predictive power, do not fully describe the quantum system. Here matter is not inert but animate and vital, full of mystery, astonishment and ambiguity. As a result, he argues our bodies and our spirits, have lost all affinity with the diurnal and cyclic rhythms of the natural environment. He advocates new maps to more accurately describe our position in and relationship to a living animate universe of complementarity and synchronicity, which the exploration of quantum physics demonstrates exists. He draws our attention to indigenous mapping with its ability to simultaneously map space and time, the sacred and the profane as well as the extraordinary and the everyday as models more completely describing the human experience, whereby 'Our minds and bodies all have access to the same creative source that animates every atom and star (Peat, 1991). However, rather than investigating our relationship to an animate universe through indigenous mapping I wish to focus on a highly urbanized environment, that of the Edo culture under the Tokugawa Regime 1600-1863. Nishiyama Matsunoske, an eminent authority on this era, states 'Something close to an ideal relation of production to consumption-that is, an ideal relation of people to nature was, in fact, attained by thirty million Japanese of the Edo period' (Matsunoke, 1997).



Figure 1. A bird's - eye view of Edo in the 1850's, "Ethnic Tokyo" Hidenobu Jinnai, Published by Process Architecture Publishing Co.Ltd.1991:15, Photo: courtesy of Tokyo Central Library

When F. David Peat describes nature seen as vibrant and alive in which we took our place amongst other creatures and plants', picturing a universe in which each atom, rock, and star drinks of the same boundless waters of creativity,' (Peat, 1991) he could well be describing the ethos that underpinned the Culture of urban Edo. This was not a 'primitive' culture based on medieval superstition but a sophisticated urban environment in which Nishiyama (1997:9) says, 'Human activity imparted only minimal damage to nature.' The maps of the period demonstrate a cosmology in which the city is nurtured by the Sumida River at its base and protected by a towering Mt. Fuji. Jinnai Hiddenobu (1995) describes it as a city of water, similar to Venice, with the underlying principle of city being a balance between the planning necessary for the defence of castle-towns, and the adaptation to the original topography and "the spirits of the land" (Jinnai, 1995). Based on Chinese principles

of geomancy and built on seven hills the city and its central castle, protected by a labyrinth of moats was organized with an intimate relationship to nature and the topography. In the woodcuts of the time, the ethos of the maps is emphasised and in exaggerated views of Mt. Fuji, everyday life was brought into an intimate relationship with its symbolic protector. 'In this way, Edo – a beautiful city integrated into the great natural world-is vividly described from the view point of the low-city commoners as constituting a single, coherent universe' (Jinnai, 1995). A unique environment was created and designed in which the city and its activities were interconnected, inseparable from nature and the cosmos it emanated from.



Figure 2. Suruga chō Suruga Street Utagawa Hiroshige 1797-1858. Image: courtesy of Tokyo Traditional Woodblock Print Association

The organizing principle of this paper is Narrative Inquiry

Despite the post-enlightenment love of rationality and mathematical order, there is difficulty accepting abstraction when lives are disrupted. Human experience demands personalization. Since humanities earliest days narratives from personnel, visual and oral accounts to the "Grand Narratives" of our traditions we have sought to explain our place within a meaningful cosmos. Donald Polkinghorne posits that,

Narrative Inquiry provides a meaningful structure to our experiences. Our thoughts and feelings affect the way we design and interact with our environment. If we are looking at binaries as complimentary we need a system that accounts not only for facts and rational explanations but for what is in our unconscious and appears in the guise of irrationality. Our dreams memories fears hopes and imaginings are a valuable source of insight into our thoughts and feelings. Through including what is under the surface and within our unconscious as well as within the collective unconscious we can more properly comprehend our experiences and reactions to change (Polkinghorne, 1988).

Today when all of the "Grand Narratives" of traditional and organized religion have come under scrutiny, the human animal clings to personalization of experience and the need for comprehension and meaning within a seemingly hostile and indifferent universe.

> Adding his cry to the malaise of separation, loss and meaningless that our sterile urban environments are forcing upon their populace Alberto Perez-Gomez says the following. Yet I yearn for more. For places that might be thoroughly inhabited and populated with imagery and desire, unlike the obsolete constructions that occupy the inhospitable grid of our city at the moment of awakening. An anguished realization of universal homelessness! (Perez-Gomez, 1992).

Perez-Gomez argues that,

> Phenomenology has shown the importance of retrieving the body as the locus of meaning, deconstructing Descartes's objectified, mechanistic body and biology's organic body to posit instead a network of internationality, the intertwining of self and world (Perez-Gomez, 1992).

Phenomenology is of great value, in dealing with the subjective and personnel. The emphasis on individuality and our ability to control, and alter the circumstances that we find ourselves in has been one of the great contributions of the post-enlightenment scientific revolution. But it is the weight of the collective unconscious which I believe plays a

defining role in how we experience disorder and is a key factor in the role resilience plays in re-shaping environments after destruction or disaster takes place. This is where I believe the usefulness of Narrative Inquiry lies.

Tokyo is a city, raised to the ground through fire and firebombing. Twice completely destroyed in the last century and more recently undergoing a rate of material change that is unprecedented. Little is left of any material artefacts or architecture, particularly in the areas of the low city around the Sumida River. Therefore, the legacy is primarily through memory and narrative rather than architecture and material objects. Kentaro Arikawa interviewed by Jeremy Narby (2005) talks of the Japanese ability to innovate, to transform and to metamorphosis. This is not through choice but because they are forced to by periodic destruction of their old buildings and their inhabitation, Narby notes of;

> ...a volcanic archipelago, [that] is one of he most seismically active regions of the world. Huge tidal waves, known as tsunami, and hundreds of earthquakes occur every year in Japan. Nature here is strong and uncontrollable. It smashes cities, floods them, blows them down. Godzilla, the monster that arises from the deep sea and comes to destroy Tokyo, simply incarnates the forces of nature. The Japanese are used to rebuilding their world (Narby, 2005).

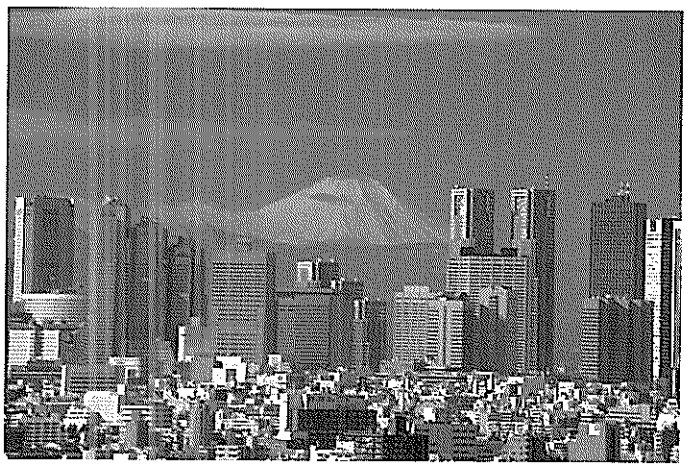


Figure 3. Tokyo and Mt. Fuji. Photo: courtesy of Tokyo Convention & Visitors Bureau 2004 Copyright

Haruki Murakami a writer and literary hero for a generation of young Japanese, has a different perspective on the current state of Japanese resilience and flexibility in the face of the rampant technological and environmental change. But he shares a strong insistence of the importance of narrative and metaphor in strengthening the psyche.

> Humans - can't live very long without some sense of a continuing story. Such stories go beyond the limited rational system - with which you surround yourself; they are crucial keys to sharing time-experience with others. Now a narrative is a story, not logic, nor ethics, nor philosophy. It is a dream you keep having whether you realize it or not. Just as surely as you breath, you go on ceaselessly dreaming your story". And in these stories you wear two faces. You are simultaneously subject and object. You are the whole and you are a part. You are real and you are shadow." Storyteller and at the same time "character". It is as though through such multi layering of roles in our stories that we heal the loneliness of being an isolated individual the world (Rubin, 2005).

The most pertinent and defining narratives of our society are those that contextualize our relationship within a meaningful cosmos.

It is important to understand that,

> Traditional urban thought in Japan may be understood as two layers: on the bottom a largely implicit set of indigenous attitudes from the ancient and medieval periods; and on the top an explicit and highly intellectual structure of thought evolves under the Tokugawa political system and moulded by Confucian ideology. ...These two layers have never neatly joined nor have they been in open conflict (Smith, 1978).

Our understanding of the earlier indigenous layer comes from the stories and myths in the *Kojiki* (the Ancient Chronicles of Japan) of 712 and the *Nihonshaki* (Chronicles of Japan) 0f 720. Although not sacred texts based on instances of divine revelation but a collection of historical, theological mythical and political narratives, they do contain many themes that form the basis of Shinto or "the way of the gods".

Everything that is manifest in the universe is interconnected, part of the web of life from the most complex organisms to the seemingly simplest says Motohisa Yamakage (Yamakage, 2006) emanating from a single source or *Dangenrei* with life regarded as an affirmative positive experience. It is not the only reality but co-exists with the "unseen world". In narratives, realms parallel to the material inhabited by gods who not only share our human weaknesses but also accept them are described. Work rituals and worship are carried on in parallel as archetypal representations of the work of humanity (Yamakage, 2006).

The *Kami* or the gods, are defined, by Fujisawa Chikao as ' the deification of the life- force which pervades all beings, animate and inanimate. Kami is the invisible power which unites spirit and matter into a dynamic whole, while it gives birth to all things without exception' (Herbert, 1967).

Another aspect of the mythology celebrated in the *Kojiki* and *Nihongi* is the affirmation of the life force and the generative creative power of the universe, equated with fertility and increase. Japanese myth, (Buruma, 1984) really began with a brother and sister Izanagi-no-mikoto and Izanami-no-mikoto who, alongside seven generations of gods emanated out of chaos. Giving birth to the islands of Japan and various deities, she burned her genitals and subsequently perished. Grief stricken her brother and husband followed, and against her entreaties demanded to look her in the face. Horrified by the pollution of death, he divorced her and in revenge she vowed to strangle to death a thousand people a day. He retaliated affirming the establishment of fifteen hundred houses for the bearing of children each day. And the battle for the supremacy of life over death began.

Despite its rampant industrialization, Japanese culture is still wedded to a consciousness of agriculture and the symbolic and actual cultivation of rice. Not only do annual events and celebrations testify to this but the affirmation of life and survival at all costs are embedded into the very fabric of society, traditional and contemporary.

But it is the story of Amaterasu, the sun goddess that has the most relevance metaphorically and literally for topic "Dancing with Disorder". Angered by her brother Susannoo's deplorable behaviour consisting of offences destructive to agriculture, she retreated into a cave and darkness enveloped the earth. This situation continued for many days with the gods in despair, their livelihood and existence threatened. This was a disastrous situation and one of the gods Ame-no-Uzume took action. As related in the *Kojiki* she threw herself into a dance "overturning a bucket before the heavenly rock cave-door," stamping "resoundly upon it," baring her breasts and pushing "her skirt-band down to her genitals" (Sadler, 1970). It was an outrageous bawdy dance, a celebration of life, fertility and fecundity. It threw the eight hundred assembled *kami* into paroxysms of laughter and Amaterasu, unable to control her curiosity, rushed out of her cave. The desperate life-denying situation was solved and her re-entry to the cave was barred with a straw rope or *shimenawa*. The incident form the *Kojiki* illustrates, R.H. Blyth suggests, 'The way in which dancing, sex (it was after all a strip-dance) religion, nature (sunshine) and humour 'with such a chain are bound' in primitive times' (Sadler, 1970).

It is a formative narrative, its metaphors resounding in many Japanese belief systems underpinning responses to the series of 'life destroying' situations they have been confronted with over the centuries. The dance is accepted as being the origin of Kagura the forerunner of Noh and Kabuki. It is still performed at Shinto Shrines, often at celebrations of thanksgiving and propitiation called "Matsuri' in which the sacred and the profane, in prayer and play restore and maintain seasonal, diurnal and interpersonal rhythms. These are times of joy and vitality as well as providing a space for transgression. Integral to the acts of thanksgiving and propitiation is the notion that the gods need to be entertained and is demonstrative of the importance of dance and laughter as essential ingredients for restoring balance when the natural seasonal and diurnal rhythms have been disrupted. Alan Sadler (1970) citing James Kirkup says, 'the *Kagura* play is truly a dream sequence. It is full of clowns and god-men, incredible heroes and stumbling idiots, in situations of utter terror and complete banality, all mixed together'.

Kagura teaches us Sadler observes, how to collectively face our fears and demons and learn to laugh at them.



Figure 4. Tsuburōsashi Matsuri Fertility Festival.
Photo:Courtesy of JennieTate, 2004 Copyright

In Edo religious space was on the outskirts sited in relation to water and forest. Temples and shrines became landmarks and then developed into amusement areas, giving Edo its distinctively sacred/profane prayer/play quality. These areas Jinnai Hiddenobu (1995) notes were not subject to the rules of secular relations and they became sanctuaries of freedom and protection and "wandering entertainers" gathered in these marginalized areas. Markets, riverbanks and under bridges were the home of the marginalized, these "ludic" spaces of liberation creating a "fantastic other world". Edo was, Henry D 5mith outlines;

> A culture that combined an affirmation of consumption with a spirit of impermanence within the Ukiyo of the theatre and pleasure worlds. Where the older native sensibility would tend to view such activity in a temporal framework of purificatory play (*hare*) apart from the everyday world (*ke*) the static Confucian worldview condemned it morally and deemed it "*akubasho*" literally bad place. This moral contradiction led to an idea of the city apart from the city, two cities less in opposition than in different worlds (Smith, 1978).

It was into this milieu of Eddoko or child of Edo, typifying pride and resistance that the expression "Fights and Fires are the Flowers of Edo" was born. Here fireman held the dual role of carpenter, ensuring prosperity, whatever the outcome of the disastrous fires that wracked Edo and early Tokyo. Life was affirmed and a complement to adversity found.

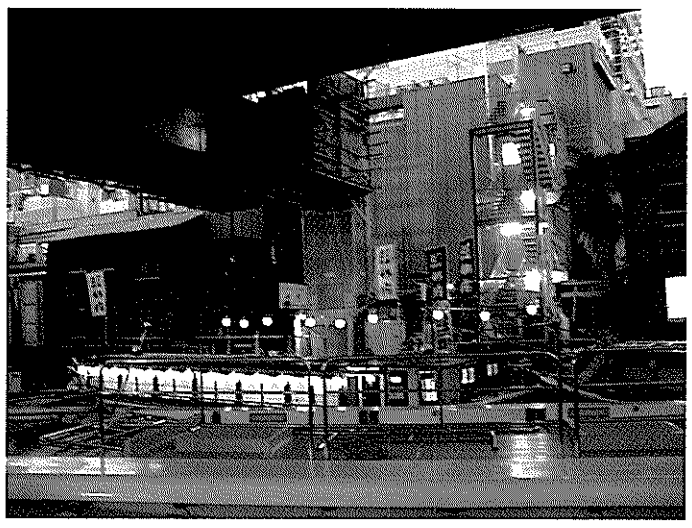


Figure 5. Hamamatsuchō Canal.
Photo:Courtesy of JennieTate, 2004 Copyright

In considering these alternate worlds and their spirit of resistance, structured into the urban pattern of Tokugawa Edo it is relevant given the ecological crisis that will bring us all into the arena of great change to note the words of ecologist Joseph W. Meeker (Peat, 1991). He suggests we can no longer afford to support a heroic society, defined by a hero (masculine) pitting himself against the gods, suggesting we need instead

> comedy [which] is concerned with the day-to-day survival of ordinary people, not through confrontation but by playing within the scope of nature's rules and dancing around them. While the hero is noble and clings to fixed rules of behaviour, comedy is lively, bawdy, concerned with the reversal of roles, fertility, and the ultimate absurdity of human authority. Whereas tragedy culminates in death, comedy ties its knots in a marriage and never ends. (Peat 1991:206)

This expression of the generative impulse and the importance of fertility and the affirmation of the life force is reminiscent of many *Kojiki* stories. The sentiments it expresses help to explain some of the paradoxes surrounding the aftermath of World War 11. John Downer (1999) provides, in "Embracing Defeat"

an account of the Japanese response to the destruction of Tokyo and the re-building of the city after the devastating fire-bombings.'The Americans arrived, anticipating, many of them, a traumatic confronted with fanatical emperor worshippers. They were accosted instead by women who called "yoo hoo" to the first troops, and men who bowed and asked what it was the conquerors wished' (Downer, 1999).

In a myriad of ways inexplicable even to the Japanese themselves their post–war wartime behaviour presented an entirely different face to 'the mystique of racial and social solidarity that had saturated wartime propaganda' says Downer (1999). Looting, robbery and self-seeking behaviour by all became the order of the day. Ordinary people, the authorities, police and even the *kami kaze* pilots became enmeshed in a ruthless impersonal battle for survival in which everyday rules of morality were turned topsy turvey. Despite an environment that was materially devastated and a population facing starvation, personnel diaries and popular culture displayed endless resistance to pessimism, with Downer observing 'sardonic humour flourished alongside despair, and for every personalized story of emotional exhaustion and shattered lives, it was possible to find an uplifting counterexample of resilience, hope and accomplishment' (Downer, 1999).

The Black Market optimistically entitled "Brightness from Shinjuku." emerged within days of surrender. As well as being a powerful metaphor the value of this was a re-affirmation of their most basic narratives; that the life force, the generative impulse must continue as an antidote to death. While recognized as a tragedy by the Japanese, World War II needs to be seen as part of a continuum of disaster that has beset the island over the last thousand years. After the Sept 1, 1923 earthquake, according to Seidensticker

> The city burned for some forty hours, and before the last embers were out reconstruction had already began. It was used to and indeed rather proud of fires, known as "Flowers of Edo," and proud as well of the speed with which it recovered. The proper merchant insisted upon speed in these matters. If a shop had not resumed business within three days, common mercantile wisdom held, it had no future (Seidensticker, 1983).

Emergency markets, street stall and barracks rose from the cinders almost immediately, and the popular " Reconstruction Song" sang out

> Completely burned out. But see
> The son of Edo has not lost his spirit.
> So soon, these rows and rows of barracks,
> And we can see the moon from our beds.
>
> (Seidensticker, 1983)

The first impulse after fire and earthquake has always been to colonize vacant space with imagination and creativity the essence of survival. But in the way the Japanese were able to transcend despair and create an environment that satisfied their survival needs, albeit of an alternate order, there is another factor to consider. That is the deep and powerful connection and inseparability with nature as an all encompassing and nurturing force. It is a similar sentiment that Downer observes after World War II in the poem written Horiguchi Daigaku.

> The country has become small and powerless,
> food scarce, shame plentiful, life fragile.
> Stop grieving! Raise your eyes
> To the tree tops, to the sky.
>
> (Downer, 1999)

This has its visual equivalent in the storyboards of Akira Kurosawa. His later work, weak in its cinematic realisation compared to his earlier achievements nevertheless demonstrated remarkable visual power. In his visualization of a scene from "Mada Da Yo" entitled 'Moon over the Ruins' he expresses a similar sentiment affirming integration with a benevolent cosmos despite the devastation of material protection.

Contemporary Narratives of Tokyo.

World War II, Downer (1999) feels, did not end for the Japanese until 1952. But it is important not to underestimate the ramifications of defeat and its ensuing 'culture of shame'. There is a deep distrust and suspicion of the metaphysics inherent in Shinto, appropriated by the Militarists of the Second World War to justify their colonial ambitions (Miyoshi and Harootunian, 1988). But the reality of Japan says, director Shohei Imamura,

> is those little shrines, the superstition and the irrationality that pervade the Japanese consciousness under the veneer of the business suits and advanced technology (Buruma, 1984).

In questioning whether narratives of resilience have permeated the new materiality of concrete and glass I wish to draw again on Haruki Murakami (Rubin, 2005). He takes us to the heart of what I believe is part of the Japanese contemporary malaise, which is the wall of forgetting that has been built around the collective memories of the second World War and its resultant spiritual amnesia. He writes for an age in which isolation, alienation and loneliness are key concerns, manifested in an ever-rising suicide rate, homelessness, teenage boys in retreat from society and a spiritual and physical and exhaustion.

Bewailing the loss of ambiguity, mystery and shadow he laments the demise of simultaneous worlds. Liberation and dreaming need to exist parallel to the everyday rational world that people find themselves trapped in. 'What I write are stories in which the hero is looking for the right way in this world of chaos... That is my theme. At the same time I think there is another world that is underground. You can access this world in your mind. Most protagonists live in both worlds-this realistic world and the underground world.'(Rubin, 2005).

But the ability to move freely between the worlds of imagination and reality can be maintained. In "*Dance Dance Dance*" the mysterious Sheep Man says connectedness can be maintained, "if you keep dancing as long as the music plays" (Rubin, 2005). In his exhortation to Dance Dance Dance, Murakamki is entreating his audience to reconnect with the life force by digging deeply into their collective psyche to memories of the co-existence of parallel worlds where dance and laughter were necessary conditions for the maintenance and balance of the generative and creative impulse.

Tokyo has danced with disorder time and time again, rising phoenix in a continual dance of resilience and re-newel.

But states internationally acclaimed architect Toyo Ito,

> Tokyo's old resilience is being covered up by a rigid frame. The city itself is gradually rigidifying. [Yet], while modernizing and becoming more and more controlled, Tokyo preserves, if only latently, a resilience and flexibility that accounted for its wonders and charm, that is not to be found in Western cities. How much longer it will be able to preserve these qualities is a moot point. The rigidifying process is proceeding every day (Bognar, 1982).

The map we now locate ourselves with is that of the subway, a symbolic grid that pays no heed to the underlying topography. It no longer depicts Mt. Fuji, cut off by the high rise, which now dominate the landscape. The Sumida River too is absent. And canals and waterways are hidden under highways and expressways. However the pleasure places, the *Sakariba* are in abundance, in their accustomed places, under the bridges and in front of the transport nodes. At night, they become alternate, liberated worlds alive with pleasure and enjoyment. However, Hiddenobu Jinnai (1995) believes they have lost their connection to water and the religious centres losing their original vulgar energies in which the ludic was intimately connected to sacrality and fertility and the celebration of the life force. It is worth heeding the words of Alberto Perez-Gomez.

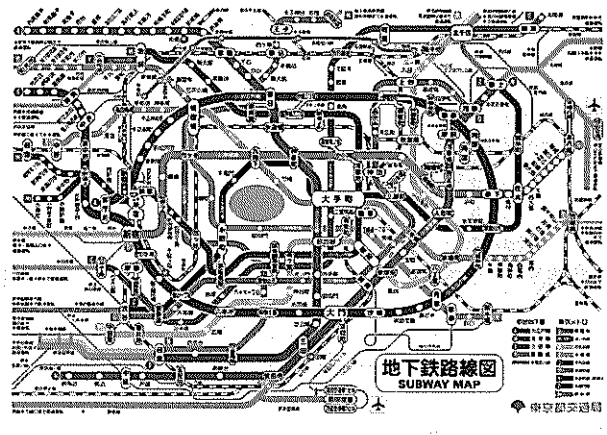


Figure 6. The Ōedo Line. Image: Courtesy of Tokyo metropolitan Govt. Transport Bureau 2007 Copyright

> I fear that authentic wisdom, the enlightenment that results from the generative union in procreation may no longer be attainable. In the democratic, genderless universe of genetic simulation and electronic space, sexual love appears as a hedonistic, inconsequential, and absolutely finite consumption of energy (Perez-Gomez.1992: 4).

Water and green space are behind much of new urban planning Jinnai adds but he too fears says that these are simply techniques of urban design and landscaping. '...the truth is that water and green space are intimately connected with human life at a far deeper level' (Jinnai 1995:68).

Edo died because of its fires and floods says Nagai Kafu but Edward Seidensticker feels it was the loss of its boats and waterways that destroyed its ambience (Seidensticker 1983:54). The "Civilization and Enlightenment" of the Meiji Era had to come but it did not require giving up the 'old sense of the earth', Seidensticker contends and despite appearances the rhythm of 'the fields and the seasons' is still present (Seidensticker 1983:5129&139). Even after World War II re-building retained the old street plan, and maintained a 'warmer and cozier' face than Nagoya which taking advantage of the bombings redesigned according to the European model (Seidensticker, 1991).

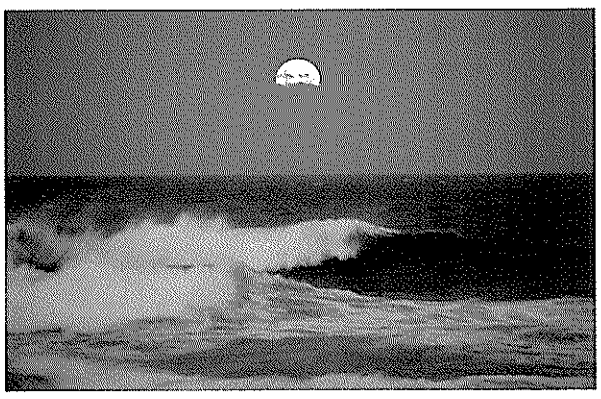


Figure 7. Moonrise. Photo: Courtesy of Michael Bates 2007 Copyright

However Haruki Murakami suggests that this relationship is now, rather one of oppression and insensitivity. "Super frog Saves Tokyo', part of a collection of short stories written in response to the Kobe speaks of a rigid uniform world. Here places for ritualised transgression are lost and anger, resentment and negativity go underground, into the belly of a giant worm residing under Tokyo. Deeply discomforted the worm is about to awaken, and Super frog enlists Katagiri, a salary man and they dance affecting the destruction of the worm saving Tokyo (Rubin 2005:259).

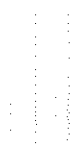
Superfrog's dance is echoed and it's meaning amplified in another of Haruki Murakami's stories. "All god's children can Dance".

> Reconciled to the mystery of his birth and his inner self, Yoshiya dances in a kind of religious ecstasy... He loves dancing however. He feels as if he is moving in time with the rhythms of the Universe... And it struck him what lay buried far down under the earth on which his feet were so firmly planted; the ominous rumbling of the deepest darkness, secret rivers that transport desire, slimy creatures writhing, the lair of earthquakes ready to transform whole cities into mounds of rubble.
> (Rubin 2005:260)

Conclusion

Tokyo and The Sumida River have been a case study for me in which I have examined how binaries as complementary, transmitted through narratives, written, oral and visual have facilitated resilience in the face of constant upheaval. The philosophical underpinnings of the culture have created a built environment that has traditionally been in harmony with nature, a relationship predicated by awe and respect, which has been able to adapt to constant upheaval natural and man-made. However, at a time in history when the world is facing unprecedented global technological and ecological change it is essential to seriously reconsider our connection to the planet and the natural environment that we are inseparably a part of. Japan is a society that has, in the urban environment of Edo and its cosmological mappings already demonstrated that a complementary relationship with nature and urbanity can be found. What is necessary is that the rhythms of that relationship are remembered and heeded and I will end with the words of Nagai Kafu.

Under the old lunar calendar the festival of the dead came at the beginning of autumn. ...But now we have imitated the West and adopted the solar calendar, and the festival comes just after the June rains or toward the middle of summer. The sadness with which the dead ought to be remembered is wholly lacking. The morals of a country are in danger when they are cut loose from the beauty of its soil and its seasons. The makers of our new age have been careless in many ways (Kafu, 1965).



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PROFIT FROM PARANOIA - DESIGN AGAINST 'PARANOID' PRODUCTS

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Abstract

Innovation is a risky business. Trying to innovate products to empower the individual against street crime, or to create designs for public space that can anticipate terrorist intentions, raise many design issues as well as what Prof. Ekblom (2005) defines as 'troublesome tradeoffs.'[1] These involve safety concerns versus address to maintaining personal freedoms. This paper will review specific troublesome tradeoffs between sustainable design goals when trying to effectively design against disaster. It will consider how and whether the design against crime model of the research and design process can and should embrace issues posed by terrorism, and whether it can be adapted to effectively do so. Discussion on this subject will occur by reviewing the 'Conjunction of Terrorist Opportunity' framework (Roach et al. 2005) and considering how the impact of acknowledging a potential 'terrorist' threat by the designer may have different consequences to other forms of crime risk problem analysis. In particular the paper will discuss why design against terrorism, delivered without appropriate forethought, could be in danger of becoming equivalent of what Martin Innes (2004) calls a 'signal crime', over-fortified in terms of a security aesthetic or problem response, and in our view meriting the description 'paranoid' product.

[1] This term, developed by Prof. Ekblom is used to conceptualise the inevitable dilemma designers face when considering what a product's primary function is, compared with what other requirements it must also meet. For example, ease-of-use vs. security (user-friendly vs. abuser-unfriendly).

Terrorism is an anxiety-inspiring method of repeated violent action, employed by (semi-) clandestine individual, group or state actors, for idiosyncratic, criminal or political reasons, whereby -in contrast to assassination- the direct targets of violence are not the main targets. The immediate human victims of violence are generally chosen randomly (targets of opportunity) or selectively (representative or symbolic targets) from a target population, and serve as message generators. Threat and violence-based communication processes between terrorist (organization), (imperilled) victims, and main targets are used to manipulate the main target (audience(s)), turning it into a target of terror, a target of demands, or a target of attention, depending on whether intimidation, coercion, or propaganda is primarily sought (Schmid 1988 cited by United Nations Office On Drugs And Crime 2007).

There are multiple ways of defining terrorism, and all are subjective. Most define terrorism as 'the use or threat of serious violence' to advance some kind of 'cause'. Some state clearly the kinds of group ('sub-national', 'non-state') or cause (political, ideological, religious) to which they refer. Others merely rely on the instinct of most people when confronted with an act that involves innocent civilians being killed or maimed by men armed with explosives, firearms or other weapons. None is satisfactory, and grave problems with the use of the term persist. Terrorism is after all, a tactic. The term 'war on terrorism' is thus effectively nonsensical. As there is no space here to explore this involved and difficult debate, my preference is, on the whole, for the less loaded term 'militancy'.

This is not an attempt to condone such actions, merely to analyse them in a clearer way (Burke 2004, p.22).

One person's terrorist is another person's freedom fighter. Popular cliché – summarised by Roach *et al.* (2005).

This paper does NOT explore definitions of terrorism! As James Burke (2004) above, points out, there are many competing definitions, a number of them summarised within the UK Terrorism Act (HMSO 2000), which, when applied, are often linked to subjective interpretations of various political tactics or militancy. Put more simply, one person's terrorist is another person's freedom fighter. Instead, we focus on design issues. We consider if, when addressing 'anti terrorism' within design practice, designs delivered compromise rather than enhance our freedom? Indeed, this paper will attempt to engage with what Benjamin Franklin constructs for us, as the Liberty versus Safety debate, when he observes: 'Those who would give up Essential Liberty to purchase a little Temporary Safety deserve neither Liberty nor Safety'[2], in relation to the design of products for public environments. In order to achieve this aim our paper will:

(1) define what we mean by 'paranoid products'

(2) review existing designs of rubbish bins for public space that have attempted to address terror tactics in the design process. Specifically, to assess whether or not these problem solving anti bomb blast solutions have been successful in terms of user experience, and their relationship to theoretical principles outlined in the 'Conjunction of Terrorist Opportunity' framework (Roach *et al.* 2005).

(3) review the applied research approach of the Design Against Crime Research Centre,[3] and Paul Ekblom's (2001) CCO framework which has led to the generation of anti theft bike parking for use in public space. Here, we point out that the model for generating design against crime (DAC) innovations, as utilized by DAC at UAL, can't simply be 'mapped onto' design against terrorism design scenarios. Adjustments in thinking need to be made, not least because terror tactics, unlike most other criminal acts, are precisely designed to promote fear in the wider context and are not an end in themselves. However, we do think the DAC model does have relevance and the paper discusses how it can be adapted for the purpose of anti terrorist design.

1. What are paranoid products?

'Fear of crime' refers to the fear of being a victim of crime... Usually the fear is disproportionate to the likelihood of being a victim of crime. Studies of the fear of crime occur in criminology. Moral panics are often the cause of rising fear of crime (Hale 1996).

Many criminologists argue that 'fear of crime' exploits social naivety. Media coverage of crime feeds the public's anxieties. Crime reports account for up to 25 percent of all news coverage. In such coverage, quantity is not the only problem, but also quality. News coverage often distorts the overall picture of crime and criminal offending (Ferraro 1995), reinforcing stereotypes and inflated ideas about so-called examples of 'deviance', as well as social decay. No wonder people are fearful. It is almost as if news reports have led to what has been called a 'vulnerability-led' focus and/or 'paranoid' security response (Durodié 2002). Risk is the issue. Signal crimes focussed upon in such media coverage 'function as a warning signal to people about the distribution of risk through social space... [or] as a warning signal about the levels and attribution of criminogenic risk and therefore can generate paranoia and paranoid products' (Innes 2004).

Dictionary definitions summarize paranoia as a psychotic disorder, whose characteristics include delusions of

[2] 'Those who would give up Essential Liberty to purchase a little Temporary Safety deserve neither Liberty nor Safety', is an often misquoted phrase commonly attributed to Benjamin Franklin. The quote is taken from, 'An Historical Review of the Constitution and Government of Pennsylvania,' first published anonymously in London in 1759. The quote is an excerpt from a letter written in 1755 from the Assembly to the Governor of Pennsylvania. Benjamin Franklin did publish the edition printed in Philadelphia in 1812, and most likely the original, but denies writing any part of it. The quote, however, may have originated from Franklin and been excerpted for the book by the author (Wikipedia, 2007).

[3] 'See www.designagainstcrime.com

persecution, grandeur, suspicion and/or excessive distrust (Soanes and Hawker 2000, p.737). A delusion is of course, a false or unrealistic belief/perception.

Paola Antonelli (2005, p.12) defines the way fear impacts on design for us, when she argues objects' speak directly to our paranoia, such as parachutes for tall buildings, a consequence of the shock of 9/11.[4] It is very unlikely that many visitors to tall buildings in America will ever find themselves in need of a functioning parachute. Yet public fears may generate free market responses because regrettably, public fear can be perceived as market demand. It can be propagated and catered to by those who wish to profit from paranoia by exaggerating risks and exacerbating public fears mediated through design. The 'paranoid products' discussed below, we argue, hook into public fears and exemplify paranoid design tendencies defined via the following aspects:

i) 'over-determined fortification'
ii) 'moral panic' (Cohen 2002) design
iii) 'delusional design' and
iv) 'normalizing of emergency conditions' products/ services



Figure 1. SUV

The SUV on the school run has become a cliché of environmentally unfriendly design and illustrates what we mean by (i) 'over-determined fortification.' If the car is perceived as an assault vehicle what is the precise risk this vehicle is defending against. Is the risk to the car driver greater than the threat of SUV to pedestrians and other road users such as cyclists?

The need to stop cars (and car bombs) being driven into High Risk buildings has produced some well designed (as well some ugly) bollards/ barriers. The crash barriers retro-fitted onto the Houses of Parliament at Westminster are particularly awful and exemplify our first category of 'over-determined/fortified design.'

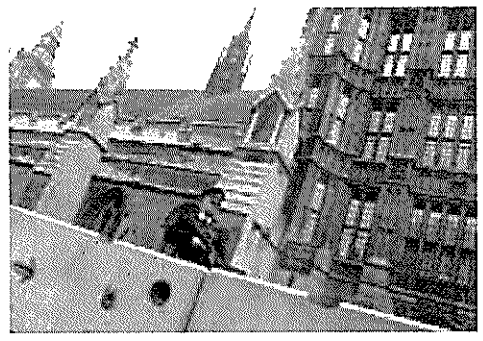


Figure 2. Barriers at the Houses of Parliament, Westminster 2006

They connote fear and defensiveness about terrorism and in our opinion denote paranoia in the way they communicate. Alain De Botton (2006) makes a similar point when he talks about design's overall 'communicative message' the notion that objects speak beyond their functionality. The Houses of Parliament are not just a High Risk Target but a significant architectural building, and a tourist stop for visitors to London. The authorities could have made much better use of design to deliver a robust but discrete 'temporary' shield for Parliament, instead of creating more paranoid fortress aesthetics. The argument from Westminster for using hideous concrete block is that they are 'temporary' fittings despite the fact that they have been there for several years now. Westminster could have done a much better design job on the barriers they specified. Companies such as TRL have produced more aesthetically pleasing objects for this purpose (barriers, planters and more). These have been attack tested for hostile vehicle mitigation, and are made of materials less likely than concrete to cause human casualties if there was an actual bomb blast.

Any design that makes a city or its buildings look like a war zone or fortress including ugly prison style bars on domestic

[4] 'The parachutes are, of course, an effect of the success of the buildings attacked in 9/11. These buildings were already fortified, and stayed up for an hour after attack, before collapsing. It was the fires inside the building that led to people jump.

windows to keep out burglars merits the label 'fortress design.' The argument we are making against fortress aesthetics relates to the old cliché that 'private affluence breeds public squalor', and that we need to look beyond individual environmental solutions to resolve our collective problems. Such arguments finds support not just from architects and designers, but also surprisingly from economists. Richard Layard's (2005) account of the economics of happiness, suggests that despite unprecedented prosperity in the West, people do not 'feel' 'happier', in part due to fear of crime and feelings of insecurity. This seems to us to be significant evidence of the need for a collective approach to environmental and economic matters, even though we accept that some readings of "fear of crime" are problematic because 'evidence about how best to assess fear of crime is contradictory' (Gabriel and Greve 2003). We interpret Layard's account, to reinforce the fact that fortress living militates against personal happiness. Worse, the media, in over determining the significance of crime, has some responsibility to the public for destabilising their experience of "well being".

Strong designs against crime/terrorism, can deliver objects that are easy to use, and easy on the eye, that protect us without promoting feelings of insecurity. Good design can address the potential, though unlikely, threat of terrorist or other violent crimes, without signalling this functionality in an over determined way, and in so doing escalating fear. Ill-considered anti-terrorist design can produce (ii) 'moral panic' products (Cohen 2002) such as the Commuter Pak below.



Figure 3. Bombproof hand size survival kit

Equipment list for this product includes:

1 Ultra bright aluminium flashlight
1 High Intensity Whistle
1 Disposable FFP3 Bio protection mask
1 Nylon carry bag with belt loop and strap
2 pairs of latex gloves
2 chemical light sticks
2 Anti septic wipes

We are pleased to report that the Commuter Pak despite its 'high durability fabric containing essential items to assist during an emergency event' is currently on 48% sale. The market has spoken to manufacturers about the short shelf life of innovation inspired from the desire to profit from paranoia and moral panic, and in so doing get the nature of the perceived threat so wrong.

'Delusional design' (iii) is a category devised to explain problematic designs such as that illustrated by the new breed of NYC subway card vending machine which can sniff trace amounts of explosives on customers' hands.



Figure 4. NYC subway card vending machine with anti-terrorist functionality

Although the above machine doesn't look any more frightening than other machines out there (it is about to be tested in Baltimore) it automatically scans all subway users who buy tickets. Its problems include the assumption that bomb-making terrorists are not creative enough to buy their subway tickets from other outlets or via someone else, and that at the present time there appears to be no clear data about the false alarm rate and the impact this may have on innocent

commuters. In our opinion, this new design is delusional in terms of what it can really achieve and will make the public more fearful about terrorism. Particularly, if they see that new machines like these are really needed.

The Anti Terror Bag & Tag illustrates our (iv) category of products that 'normalize emergency conditions'. It is a waterproof PVC, clear/see-through duffle style bag. The manufacturers argue that the bag is 'perfect for use under the current climate of terror threats at airports and many other commuter areas.'

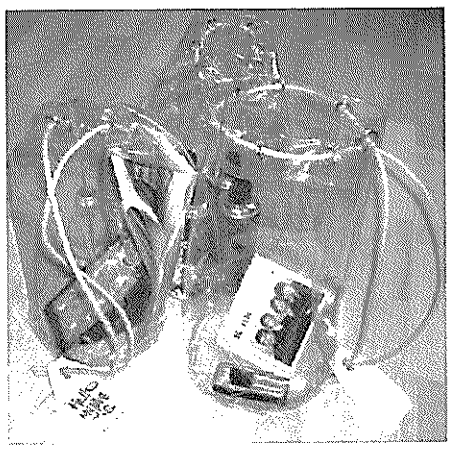


Figure 5. Anti Terror Bag and Tag

Evidently, this bag 'will allow you and your friends, family and fellow passengers a much smoother, faster and hassle free journey.' A jokey version with a sticker that says 'Say No to Bin Laden' went round on the Internet, after 7/7 as desirable wear for the male bearded Muslim backpacker. Because of negative stereotypes, bearded Muslim men travelling on the London tube with backpacks found themselves suspected of being terrorists, by fellow commuters who left the carriage and went further down the train.

In designating the functionality or aesthetics of the above design responses as 'paranoid', we don't just want to provoke discussion about our specific examples, but use them to make broader arguments. To begin to question how far fear and anxiety about terrorism (or exaggerated perceptions) should inform product design and in particular government funded design for public space. Obviously transparent information and communication about terrorism from the authorities, needs to be delivered through clear overt strategies that don't alarm but inform. For example, clear information about what to do about a discarded bag on the tube, is written using directional and non-alarmist language.

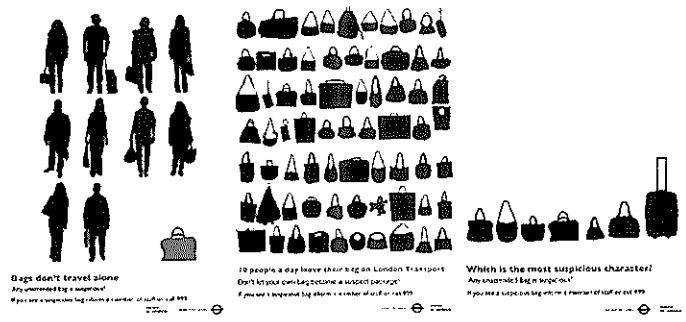


Figure 6. Design work by Central Saint Martins' student, Georgina Potier, for D&AD Awards, © Georgina Potier 2006

But covert strategies have a role to play for the authorities too (not just terrorists) and designers should be leading these interventions. Future design against crimes of terror for public space, in our opinion, should not exaggerate the threat of terrorism but use discreet covert strategies to in-build anti terror functionality and avoid escalating fear. This will occur by emphasizing not just the anti terrorist aspects of the product, but its ultimate performance in relation to a friendly user centred design that is ultimately linked to its functionality.

What we are saying is that all anti terrorist design needs to be thought through carefully before design commences, or designers will find themselves unwittingly contributing to a paranoid society. Or contributing to what the sociologist Frank Furedi (2002) had described as a 'culture of fear' that can 'lead the authorities to terrorise themselves and us far better than terrorists' (Gearson 2002 cited Durodié 2002, p.16), and thus compromise our mental freedom while trying to protect our physical bodies. For, as Andrew Bolton (2002, p.81) has pointed out:

> It is unlikely that we will be run over, mugged or sexually assaulted [or victim of a terrorist attack]. It is equally unlikely that we will be shot by gang members or have our throats slit by a sociopath. But it is likely that we will come face to face with our anxiety about any one of these dangers.

2. So why 'Bomb Proof' rubbish bins for public space?

Following a bomb in Victoria Station, London in 1991 that killed one person and injured 40, public dustbins were assessed as a potential target of terrorism. They were banned from underground and mainline stations in and around London and other British cities (ATOC 2005). This strategy has also been adopted by other regulated 'crowded places', including some shopping centres[5], who like the London underground, in key geographic areas have replaced dustbins – with either no provision at all or a ring that holds a see-thru plastic bag. These temporary bins have to be attended by regular cleaning staff to empty, or if there is no plastic refuse bag in place, to go round and sweep up discarded rubbish.

Anti rubbish bin strategies have also been adopted by many other European cities, in addition to London. One critic observes that 'in some tourist areas of Paris, such as the Champs-Elysées, rubbish bins are simply non-existent... The problem is not the inefficiency of the local authorities, but a fear of terrorist attack. There is nothing simpler, for a terrorist, than to hide an explosive device in a rubbish bin' (Mariani 2006).

In order to address the perceived problem of terrorism, and thereby limit or exclude such terrorist behaviour from some public contexts, several design companies have tried to create a bombproof dustbin. We will review two of these designs herein. The first is called 'Blastshield' designed and manufactured by Aigis, Derby, Britain (2001). The second is called 'Trashshark' designed and manufactured by Bruco, Zurich, Switzerland (2002), which won the 2006 Reddot Design Award, a prestigious Swiss product design award.

Blastshield was marketed in 2001 as offering features that help it absorb a blast 'big enough to blow up a car' (Graham-Rowe 2001). It is made of thick glass-reinforced plastic with an inner layer of Tabre. Tabre is a smart material that appears as a stone-like substance, but whose porosity and permeability allow shock waves to be broken down by the material, thus absorbing blast energy and slowing it down. Its casing has been likened to a 'gun-barrel' that forces the blast upwards where it encounters a dome lid containing water and air... When the shock wave penetrates the lid, the water is converted into steam, absorbing all the energy' (Graham-Rowe 2001).

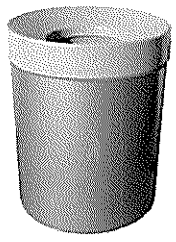


Figure 7. Blastshield by Aigis, Derby, Britain, 2001

The flaps on the Blastshield have been strongly engineered so that there is no exit route for the blast. However, the size of these openings limits user experience in order to control the size of any bomb that could be planted. In addition to aperture restrictions, the cost of these bombproof bins may be prohibitive, compared to standard public rubbish bins sold by British companies such as Broxap.[6] But as New Scientist (Graham-Rowe 2001) has already pointed out, costs may not be so troubling if we take into account 'the costs of not having adequate refuse collection at stations, or of employing more station cleaners and the inconvenience to the public' (Graham-Rowe 2001).

The Zurich company Bruco are also currently marketing a bomb unfriendly rubbish bin, called the Trashshark, whose design (shown above) is allegedly suggestive of a shark's head. According to 2006 press reports, Bruco are currently selling up to 5,000 a year to European cities (Mariani 2006). An explosives expert at Armasuisse – the Swiss army agency which purchases and assesses military equipment – set off a hand-grenade inside one of the rubbish bins. The bin split in two, but it was effective in absorbing almost all 1,700 fragments of the hand-grenade (Mariani 2006).

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[2] Public dustbins were assessed as a potential target of terrorism. They were banned from underground and mainline stations in and around London and other British cities.

[6] For example, a standard 120ml capacity bin would cost £252 per unit. A Broxap Blast Resistant Bin, 120ml capacity, would cost £328 per unit (Broxap 2007).

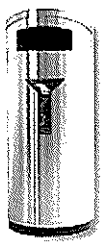


Figure 8. Trashshark, Bruco, Zurich, Switzerland, 2002

The bin is made of five-millimetre stainless steel plating, and like the British design directs blast upwards, thereby limiting the effects of the explosion. At extra cost the bin can be made with tough transparent polycarbonate 'windows', so that its contents can be seen, without compromising the efficacy of the design.

Strengths and Weaknesses of 'Bomb Proof' Rubbish Bins

Blastshield and Trashshark design in our view are not needed except in high risk contexts, even though they mask their anti-terrorist functionality. To assess what these contexts are, we should not solely rely on the manufacturer's own recommendations, or press reports, or even our aesthetic and user focussed analysis. Ekblom's (2003) framework of crime/terrorist prevention principles, originally published as the Conjunction of Criminal Opportunity or CCO (Ekblom 2001) and put forward by the Design Council when promoting the need for design to engage with designing out crime, is more appropriate (Design Council 2003), it offers a rigorous approach for addressing such crime prevention questions.[7]

In CCO, Ekblom (2001) argues that 11 generic principles of intervention in crime will provide a way of understanding all criminal events or crime stories (Design Council 2003). CCO construes offenders as predisposed, motivated and resourced, who encounter or engineer, 'a crime situation comprising a vulnerable and attractive target of crime, in a favourable environment and in the absence of motivated and capable guardians' (Ekblom 2001).

The principles are further developed by Roach *et al.* (2005, p.22), as CTO, to offer a diagnosis wheel of the 11 immediate causes of acts of terrorism:

1. Reducing terrorist predisposition

This can entail intervening in the early lives of potential terrorists (upstream) in order to reduce identified 'risk factors' and to promote known 'protective factors'. These measures could involve working with families, schools or peer groups to promote for example diversity and racial, cultural, religious and political tolerance. Reducing terrorist predisposition will have an effect on factors such as terrorist recruitment. Interventions to reduce the degree to which individuals and communities are socialised in or converted to a particular ideology associated with terrorism, are also possible, as may be remedial interventions aimed at converting them to peaceful ways of achieving goals. Interventions aimed at changing an entire ideology or movement are too ambitious (although they happened with the de-Nazification effort in Germany after World War 2), but knocking out individual props of an underpinning belief system may not be – in theory. However, even this could have unpredictable, perhaps counterproductive, results and it may be both less risky and more appropriate to tackle remoter causes which are driving people towards extremist versions of belief, rather than directly targeting those beliefs themselves. Whatever the case, some kind of ethical framework would need to be developed to set acceptable limits on this.

2. Supplying resources to avoid terrorism

[N]ot just to individuals but to institutions and cultures as well. This includes providing potential terrorists with non-violent means of pursuing their causes (e.g. debating, media, negotiating and lobbying skills). Terrorism is a form of political action and interventions must be developed that open more democratic avenues that terrorists might perceive as 'just' and worth pursuing. But the extremist views held by terrorists make

[7] Demonstrated also by the fact that the framework is recommended by Royal Society of Arts (RSA) to designers entering anti-crime design competitions; also by the Design Against Crime (DAC) Research Centre at Central Saint Martins when setting student design briefs, and by the fact that the framework has been addressed and incorporated by the Centre when delivering DAC practice led research projects, that have produced design outcomes such as the Stop Thief chairs.

these types of interventions particularly hard to develop and successfully implement. Contentious, but the IRA agreed to give up their use of terror to concentrate more on mainstream politics, and would not have done so had they thought that the democratic process in Northern Ireland still held no prospect of progress for them. An alternative example of supplying resources would be finding rewarding and dignified employment for ex-Soviet scientists and military personnel.

3. Reducing the readiness to use terror

This covers such interventions as reducing conflicts (both domestically and internationally) and reducing 'stressors' such as perceived religious intolerance and injustice (political, economic and social).

4. Restricting the resources available to the terrorist

This covers such interventions as controlling the weaponry, tools and information (e.g. targets and tactics) available; detecting/penetrating offenders' enclosures; and controlling the promoters who may supply them. An international clampdown on arms smuggling, with increased international intelligence exchange, is an example of a situational measure which addresses global issues. Control of recruitment is of obvious importance, as is the group size, growth and efficiency to carry out their acts. Interventions that disrupt the organised crime which funds terrorist groups (or those states that sponsor terrorist organisations) are further examples.

5. Excluding terrorists from the situation

For example, detaining suspected terrorists using legislative powers, extraditing suspected terrorists and co-operating with other states to prevent suspects entering the country. Excluding suspects from places within a country is also possible (e.g. injunctions to stop suspected animal rights activists from going near the homes of pharmaceutical company employees).

6. Deterrence

Raises the perceived risk of getting caught or failure for terrorists; discouragement makes the terrorist think that the effort to commit the act is too great for the reward to be gained. As previously mentioned, rewards are personal to the terrorist and range from having a product withdrawn from sale to achieving glory in heaven. Discouragement interventions need to be specifically targeted to the individual motivations, as do interventions involving awakening conscience and increasing empathy, implemented to counter the terrorists' strategies for neutralising the pain, shame and guilt caused by their acts (for example, through condemnation by their community leaders/members). These interventions have to be designed in full awareness of the 'ideological predisposition' they are intended to counter. As such, they require deep knowledge of cultural anthropology to minimise the risk of backfiring, (e.g. by misinterpretation of quotations from religious texts). On the situational side are a range of familiar techniques to: increase the effort for the terrorist, increase the risk, reduce the reward, reduce provocations, remove excuses and enhance empathy.

7. Target vectors

Interventions that prevent people and things becoming target vectors will be largely situational. The targeting of builders in Northern Ireland during the troubles led to them receiving protection from the British Army and police. The use of the twin towers in New York by Al Quaeda as a target vehicle (and the concern about nuclear power-plants becoming targets) has led to the introduction of many situational prevention measures (e.g. increased airport screening and the increased monitoring of pilot training, anti-aircraft installations etc) to reduce the likelihood of such a tragedy happening again. Construction of buildings which are not obviously 'head and shoulders above the rest' or with names that are not symbolically provocative to anti-capitalist or anti-Western movements may be prudent. But there is again a trade-off between being prudent versus giving some kind of 'surrender' message to target audience and the enemy. Dispersal of targets is a method used (e.g. with the components of expensive car radios, which are distributed around a vehicle, and the same approach can be applied to buildings and facilities). However, too much dispersal in some cases can pose difficulties too. Entire networks, physical, such as electricity grids or water supplies need to be protected - new attack- monitoring systems developed (e.g. CBRN) and procedures for limiting the damage once an attack is happening (secondary safety) or has happened (tertiary safety). Some

principles can be developed to aid the selection of which targets to protect. Clarke (1999) introduced the concept of 'hot products' to identify and predict features of things like mobile phones, cash etc which are likely to make them at risk of being stolen – characterised by the acronym CRAVED (Concealable, Removable, Accessible, Valuable, Enjoyable, Disposable). It should be possible to identify some similar features of products, places, systems, people or organisations that make them prone to use as target vehicles of terror.

8. Target audience

Interventions to protect target audiences are hard to define. The target audience for the Warrington bombing (IRA) was the British Government, probably because a previous attack in the North East of England had been foiled the previous week. The Government did not need protecting in the literal sense of the word their vulnerability was a political one, with the public's dismay at why the bombers had got through. More recently the bombing of Madrid can be seen as a contributory factor in the incumbent Spanish Government failing to win an election, when they had been forecast to do so.

9. Target enclosure

Well-established techniques such as 'target hardening' and 'access control' used to modify situations to prevent crime, are applicable to preventing acts of terrorism. Multi-layered target enclosures and associated access control (the 'onion skin' approach) can confer defence in depth.

10.The wider environment

Changes which make the environment less attractive, less likely to generate offending or less logistically/tactically favourable for offenders. Preventing ordinary crime by environmental interventions normally has a local focus. Anti-terrorism interventions however range from changes for example, in the design and management of shopping centres, stations and airports to ones of a much grander scale, extending to national and international levels. Areas containing specific national icons may attract terrorist attention; so may require broad protection via surveillance, redesign of road layouts, access points etc. Reducing conflict is a major intervention principle on the social side which bridges environment and 'readiness to offend'. Methods include various kinds of mediation and arbitration.

11. Boosting preventers (including 'capable guardians')

This can be through 'formal control' (e.g. increased security patrolling, surveillance, intelligence-gathering and investigation, and the acquisition/placement of informants) or 'informal social control' (e.g. increased employee and public vigilance).

12. Discouraging and deterring terrorism promoters

Where promotion is deliberate and knowing, these interventions can include measures that awaken the conscience of any supporting community (e.g. supplying images of innocent people mourning their lost ones) or tough legislation to deal with active sympathisers. Positive 'hearts and minds' actions can be implemented alongside sanctions. Measures against careless promoters can include anything from reminding people to lock doors or take their bags when leaving trains, to campaigns warning that purchasing pirate DVDs may be funding terrorists.

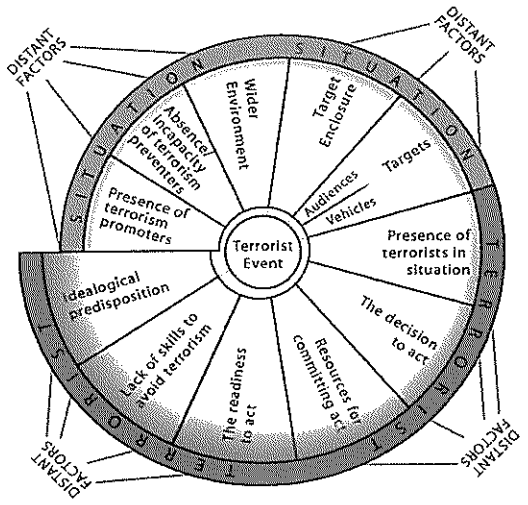


Figure 9. Immediate causes of terrorism from CTO Framework.

We believe the above categories can be useful in focussing discussion of the strengths and weaknesses of the Blastshield and Trashshark design interventions. Indeed, we feel that

the functional design attributes of these anti bomb rubbish bins address 2, 4 and 6, above, i.e. intervening to stop at least three of what Roach *et al.* (2005) define as the eleven principal causes of terrorism.

Significantly too, the UK and Swiss 'bomb-proof' dustbins, whilst clearly more expensive, than those public rubbish bins that do not help contain bomb blasts, do not look 'paranoid' or defensive, even though they offer anti terrorist protection by design. In our opinion they are unlikely to be noticed as 'defensive' crime signal and thus promote even more public fears about crimes of terrorism, but instead discreetly fit into the contexts they have been designed for. Paola Antonelli (2005), however, sees the situation very differently to us. She comments, that she feels bombproof plastic bins, are less user friendly than see-thru plastic bags. She says 'a perfectly transparent plastic bag hanging from a steel ring allows everybody to see everything, creating the sort of defensible collective space hailed by Jane Jacobs (1961) in her 'eyes on the street' theory which advocates involvement of citizens in their own protection program' (Antonelli 2005).

Our concern would be that in actively relying on an 'eyes on the street' to watch out for bombs in bins, we may be promoting a paranoid placebo one that incites the public to think about terrorism without providing a solution that is sure to detect or avoid it. After all how would you be able to tell the difference between a discarded super size shake container which conceals a bomb and one that doesn't, when viewed through a clear plastic bag? Though the design solutions may be equally low tech, we propose that the interrogation of the design proposals and their context should be rigorous and structured so as to ensure effective address to user desires and avoid opportunities for mis-use and abuse.

We feel therefore that the Blastshield and Trashshark bins offer a 'stealth utility' aspect, defined elsewhere by designers from Vexed Generation, as a way of offering protection against adverse or challenging conditions, without promoting their presence.

> Stealth Utility: ...secret procedure; surreptitiously utility; usefulness; profitableness; useful thing; severely practical. These pieces [of the collection] are semi - tailored with subtle detailing providing maximum utility to the wearer e.g. folded collars become full hoods, concealed pockets are capable of carrying A4 documents. All pocketing is fitted with concealed zip entry for maximum security. A contemporary classic appearance is equipped with fully functioning stealth utility... (Thorpe and Hunter 2001).

In the context of Design Against Terrorism, this design strategy might require hidden or silent features to act as 'preventers' of crimes/terror, designed to thwart criminal/terrorist MO's. Such solutions offer prevention capacity, explicitly NOT by alerting, motivated and empowered public members to act as crime preventers, but rather through the 'invisible hand' of the designer to aid anti terrorist objectives.

It is also our contention that when designing against the crimes of terrorism, it is important to fully understand both terrorist perpetrator techniques and terrorism prevention principles and to establish the myths and realities relating to 'fear of terrorism', before catalyzing new design against terrorism innovations.

One of the central arguments of this paper is that designers need to be aware of issues about fear of crime. In particular to understand the relationship between crime and terror tactics, and to take care to inform their own perceptions with robust research and significant evidence. Our contention is that without complex appropriate design forethought, linked to a clear framework of questions about crime and terror tactics, inappropriate design and paranoid products are likely to be the result.

3. How design against crime thinking has relevance for design against terrorism.

Whilst the model for catalyzing Design Against Crime (DAC) Innovation can't simply be mapped onto the design of anti-terror design response, with some adjustment we believe they could be of great use. So we should define what is meant by DAC, as referred to above. DAC at University of the Arts, London (UAL) is a socially responsive, practice-based research initiative that uses the processes and products of design to reduce all kinds of crime and promote community safety

whilst improving quality-of-life.[8] It is linked to the theory of situational crime prevention (summarized in Clarke 1992) and in a nutshell suggests that crime is primarily about opportunity, and that IF we can design out opportunity for crimes to occur in the first place, we can reduce crime, and perhaps also the number of people who become victimized and criminalized. DAC is a relatively new, interdisciplinary area of enquiry developed through innovative national and international research collaborations that commenced in the UK in 2000.[9] It has three overarching aims:

1. To reduce the incidence, impact and fear of crime through the design of products, services and environments that are 'fit for the purpose' in all other respects;

2. To equip design practitioners with the cognitive and practical tools and resources necessary to achieve 1 (above);

3. To promote the social and commercial benefits of designing out crime to manufacturing and service industries, local and national government, and society at large.

To realize these aims requires linking two worlds; helping designers to 'think thief' and aiding crime prevention and security experts to 'draw on design'. Recently completed design research projects that embody both the theory and practice of DAC emanating from UAL include: Karrysafe anti theft bags and accessories (Figures 10-12), Stop Thief anti theft chairs and Bike Off – anti theft communication solutions (Figure 13) and more recently Holborn Gateway bike parking solutions.

Figures 10 - 12. Karrysafe range of anti theft bags and accessories (For further information see: www.karrysafe.com)



Figure 10. Karrysafe Screamer bag

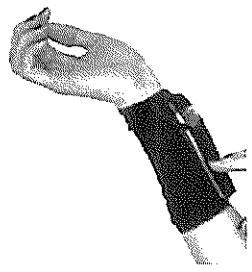


Figure 11. Phonesafe accessory

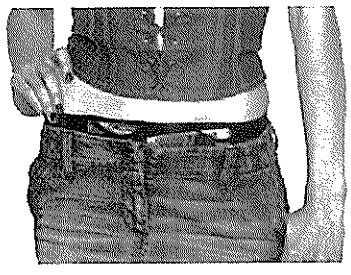


Figure 12. Bodysafe accessory

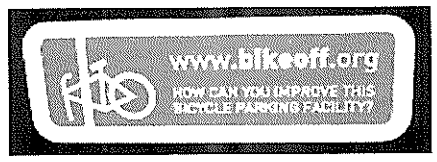


Figure 13. Bike Off Sticker
(For further information see: www.bikeoff.org)

The philosophy behind DAC as a practice led design research agenda is linked to the understanding that design should address security issues without compromising functionality,

[8] See: www.designagainstcrime.com, www.karrysafe.com and www.bikeoff.org

[9] Design Against Crime is an initiative that has been supported by the British Government and UK Design Council (www.designcouncil.org.uk), who funded DAC at CSM alongside colleagues from the Universities of Salford, Sheffield Hallam (www.designagainstcrime.org) and Huddersfield (www.hud.ac.uk/hhs/dbs/acg/index.htm), together with the Royal Society of Arts whose Student Design Awards/Design Directions programmes (www.thersa.org.uk/rsa_design/directions/archive.htm) have included briefs on crime-resistant laptops, cash machines, bicycles and rucksacks, hospitals and schools.

aesthetics or other forms of performance, i.e. the simple idea that 'secure design doesn't have to look criminal or ugly'. Our research projects attempt to think 'abuser' and 'mis-user', as well as 'user' and to '... help designers keep up with the adaptive criminal in a changing world' (Ekblom, 2000). This generative design approach has led to much product design innovation and many DAC design exhibitions. Over the last five years a number of DAC objects, including an anti theft bike, have been presented to the international design arena, most recently at Safe: Design Takes on Risk – Museum of Modern Art, New York, 16 October 2005 – 2 January 2006 (Antonelli 2005).

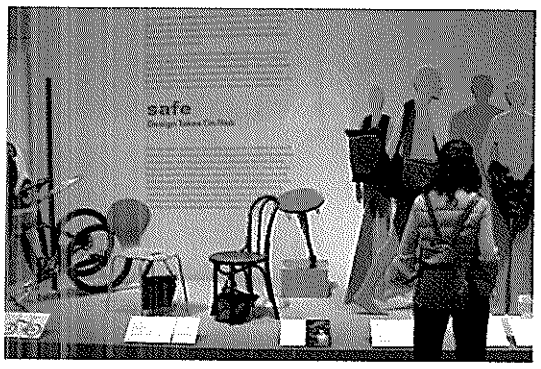


Figure 14. Design Against Crime at Safe: Design Takes on Risk, MoMA

DAC at UAL has adopted a research methodology based on the user focus of interaction design, associated with design consultancies such as IDEO (Myerson 2001) who fully research user needs, but additionally addresses 'mis-use' as well as 'abuse' in terms of the 'ethnographic' review of factors to be drawn upon in the design process. This process has been described by Barab *et al.* (2004) as 'critical design ethnography...' which differs from straightforward ethnography, 'because it involves action as well as critical reflection, aimed at transform things...' In order to move beyond experiential data and interviews with users at the research stages, DAC coalesces the conceptual frameworks, methodologies and practices of situational crime prevention, social anthropology, and cognitive psychology in terms of user-centred design, to offer an interdisciplinary account. It introduces: theory, many forms of empirical research, as well as user data, and an understanding of criminal perpetrator techniques, into the design process (see Figures 15-18 linked to bag theft).

Figures 15 – 18. Perpetrator techniques

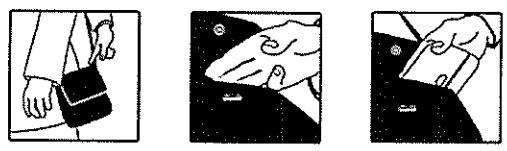


Figure 15. Dipping

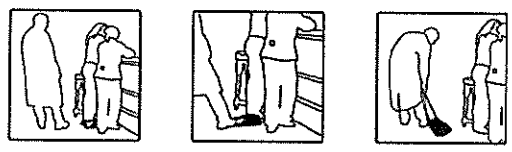


Figure 16. Lifting



Figure 17. Slashing

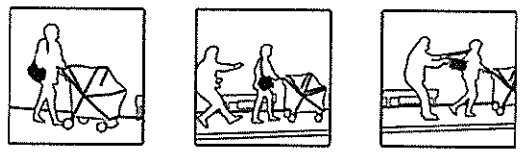


Figure 18. Grabbing

The DAC process is an iterative design process, one that has been evolved at UAL, to enable designers to test out design concepts (or hypothesis) in context of a design advisory panel, made up of experts including crime prevention advisors and other user as experts, who have strategic knowledge of the use, mis-use and abuse of objects in every day life.

Like all approaches to design that contain some aspect of 'forecasting' DAC advisors and designers engage, as Ekblom has pointed out with 'practical consideration in handling the uncertainty which by definition surrounds the estimated risk. It is pretty likely that on average, some types of product will be riskier than others' (Ekblom 2005, p.222). The strategic 'consultation' process that occurs at

stages during the development of design iterations can help manage such risks.

The diagram below created in 2004-5[10] visualizes the iterative DAC process, and shows the stages of prototype creation where the designer designs the product, system or service, in order to anticipate the interaction of many types of users (including victims) as well as abusers and mis-users (criminal perpetrator data), before showing it to the advisory panel for feedback.

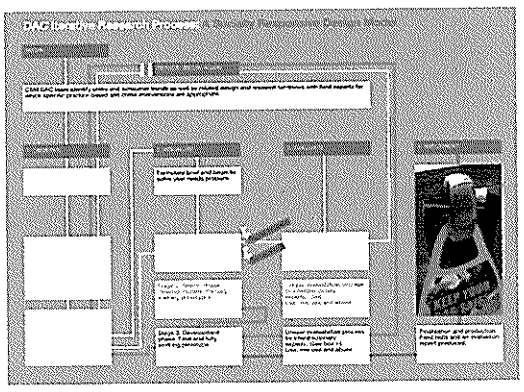


Figure 19. DAC Iterative Process

Several prototypes are amended before the final iteration is agreed upon. Focus is maintained on ensuring the design is friendly to users, in terms of the product's primary function, in addition to other mis-use or abuse the product might respond to.

In order to ensure the object, service or system has achieved its aim, some testing is necessitated by the process, and it is here that research funding is crucial, because it is often too expensive for the market to really do anti crime testing properly. Indeed, the testing of objects for public spaces, in particular, needs to be undertaken to exacting standards to ensure that anti crime functionality is perfected.

[10] The first diagram of process was published on www.designagainstcrime.com website and in Gamman and Pascoe (2004). The version in this article was created by Keith Gray for a paper given by Dr. Lorraine Gamman at Magdalena: 7th International Festival of Creative Communication, Maribor, Slovenia, May 2005.

4. How Design Against Terrorism can learn from DAC?

As explained earlier Ekblom's CCO framework (2001) has been adapted to address the conjunction of terrorist opportunity. We believe the DAC methodology of the design process can evolve for similar use. DAC uses CCO at the research stage, and goes on to review perpetrator techniques, and apply an iterative design methodology, one that has been proven across various design projects. It has already proven effective in the realization of user-friendly products that do not sacrifice user freedoms in their pursuit and delivery of increased security. The DAC design process therefore may assist the anti terrorist in avoiding the creation of paranoid products though the consideration and comparison of user requirements with mis-user and abuser modus operandi, and through the expert review process. Paranoid products should only be created if the designers consciously choose to use excess as an aesthetic device to deliver social comment. Even then, designers need to think very carefully about the context the design is aimed at before design work commences.

5. Parody and Paranoia

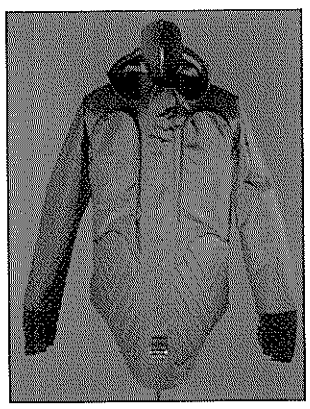


Figure 20. Vexed Generation Parka

The Vexed Parka, shown earlier, ostensibly provides riot clothing for party goers and was originated with the aim of aesthetically parodying the unnecessary use of riot gear by British police to break up parties (rather than actual riots) in the 1990s. The designers say it mimics riot gear in a deliberately over-determined way to critique/provoke a discussion about paranoid policing. This is what is meant by a fashion statement.

Industrial design is traditionally less dramatic and transitory than fashion; its production costs (e.g. of tooling-up as well as materials used) are often far more expensive than a fashion run. Its outputs are also expected to function in a user-friendly way, as well as solve problems, and to have great longevity, as well as low maintenance costs. For all these reasons, the integrity of a product's use and function in public space should always come first in the designer's mind, including the way it communicates.

Increasingly more products delivered by small product design companies, such as Suck UK have adopted an almost situationist approach within society. Primarily, here the comment/attitude of the product is usually more significant than the function of the object, which may end up as ornament. Some products go even further, for example they parody functionality itself; see Hulger handset; where a large 1940s British Telecom black handset has been adapted to fit a small mobile phone. We enjoy such playful and humorous design, which is often aimed at social expression and/or used in domestic or semi private space. We would not dream of prescribing against enjoying 'wicked' or what Bates and James (2002) have described 'evil' design or prescribing against its existence. But the anti terrorist design objects, discussed here, offer no polemical social comment, and are clearly not objects with attitude aimed at creating a political debate, or even fun. Often, such design language exists because designers haven't completely thought through the contextual implication of their designs, and have, perhaps unwittingly, made a design contribution to a paranoid society. The design tragedy of many paranoid products, in our opinion, could have been avoided if the designers had access to the rigorous questioning of the DAC research framework and design process, which we argue can be adapted to deliver appropriate design against terrorism for public spaces.

Conclusion

We have shown how designers need to understand what Frank Furedi (2002) describes as the 'culture of fear' and what Bill Durodié (2002) defines as 'vulnerability-led' responses that may lead to paranoid products before beginning to design against terrorism. Indeed, government warnings may produce anxiety-led demands from the public, but we vehemently believe that a good industrial designer should be socially responsive and responsible, and not simply respond with products like the emergency kit shown earlier but more carefully think through what it is actually needed. We note that in Britain the individual is statistically more likely to win the lottery than to be blown up by a terrorist bomb, and we believe our design and architecture should reflect this fact.

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INFORMATION FOR PEOPLE ABOUT MEDICINES: WHY IS IT SO DIFFICULT TO SWALLOW?

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Abstract

Situation: Patients, doctors, pharmacists and nurses must receive visual information about medicines. Without instructions, warnings and risk-benefit information, it is not possible to prescribe, dispense, or take medicines appropriately.

Problem: Patient involvement in the development of package leaflets is obligatory in the European Union. This involvement should guarantee that the text and the design of package leaflets is 'comprehensible and easy to use'. Unfortunately, the legislation makes some incorrect assumptions of user-involvement in the design process. Patients, doctors, pharmacists and nurses therefore receive sub-optimal information.

Approach: User observations, contextual inquiries and diagnostic tests in hospitals, in pharmacies and in domestic situations are undertaken with the aim to build a collection of 'user experience models'. These models provide a basis for design developments and structure the involvement of stakeholders.

Conclusion: The results indicate that the design of information about medicines for doctors, pharmacists, nurses and patients is highly problematic in some specific situations. The design of information benefits when it is based on sturdy user experience models, when all information resources are considered and when all stakeholders are involved. A change in the legislation seems to be essential.

1. What is the problem and is that a disaster?

In order to answer this question, it is necessary to find out if there is a problem in the first place. Four groups of figures can be used as indicators for medicine use at the moment: economics, effectiveness, accidents, and practical use.

Group 1: Benefits and costs.

In 2004, at least 10% of the total costs of healthcare in Europe was directly related to pharmaceutical care (Tinke and Griens, 2006). In 2005, each citizen in the Netherlands spends about € 275,- on medicines. The costs in other European countries varies between € 230 in Denmark to € 505 in France. It is expected that these costs will rise by about 11 percent every year. The main reasons for this increase are an increase in population, an increase of the number of elderly - who use more medicines, the movements from hospital care to home care, the use of more expensive medicines, and changes in the prescription behaviour of doctors. The costs of medicines in hospitals, elderly care homes and medicines that are bought on the internet have not yet been include into these figures.

There are many initiatives to reduce the increasing costs of medicines. Governments, doctors and pharmacies try to make people more aware of the costs of medicines through for example television campaigns and by replacing 'branded medicines' by their 'generic copies'.

Apart from the costs, it is essential to consider the financial benefits of medicines as well. Many working days are saved by simple painkillers, and patients can leave hospitals earlier due

to the use of medicines. The mysterious calculations of the price of medicines and their financial benefits are in general seen as acceptable.

Group 2. Used and unused.

Each European receives on average about 8 prescriptions for medicines per year. In order to establish how well these medicines are used, it is necessary to conduct research. The medical literature calls this 'compliance', or more recently 'concordance' or 'persistence'. This research investigates how effective medicines are taken. The Cochrane Collaboration and the World Health Organization (WHO) published figures about compliance, and these indicate that about half of the medicines for chronic diseases are not taken according to the instructions (Haynes, McDonald and Garg, 2002).

Of course, it is essential to look carefully which medicines are investigated. It is likely that oral contraceptives and insulin are used more effectively than medicines that lower cholesterol or reduce bloodpressure. It is likely that medicines of which the consequences of not-taking are directly clear for the patient are taken according to the instructions. A quick look at the bulging medicine cupboards containing unused medicines provides a solid indication of the waste of expensive goods. This is not to say that medicine cupboards must be empty: there are several medicines that are essential in every household. People rarely throw medicines away and some are kept for years even though their function is forgotten and the expiry date has long passed.

Group 3: Mistakes and accidents.

It is not absolutely clear how many accidents are related to the use of medicines and what the exact effects of these accidents are. The American report To err is human (Institute of Medicine, 2000) had a few years ago a substantial influence on the medical and pharmaceutical sectors. According this report, every year between 44.000 and 98.000 people in the United States die due to mistakes related to the use of medicines. Extrapolated figures for Europe would mean that every day between 8 and 16 people per million inhabitants die. Furthermore, every year, about 90.000 people in the Netherlands are admitted to hospitals for a treatment that was made necessary because medicines had been used incorrectly (Bouma, 2006). These 'mistakes and accidents' can not be seen as 'real accidents'. They are embedded in the systems and accepted as normal.

Group 4: Increased use.

The fourth group of figures is probably causes the largest increase, but is also the most speculative. We will all be using more medicines in the future. It is not only that older people are getting older, and older people will form a larger part of our societies, but the healthy will take more 'preventive medicines' to stay healthy.

The figures in these four groups are not absolute. They are all based on aggregates, extrapolations and estimates because it is difficult to investigate the actual numbers. However, a cost increase of at least 10% per year, an ineffective use of 50%, many fatal accidents per day and a substantial increase in the use in the near future do not provide very comforting information. Even if these figures are wildly incorrect, they are worrying. The combination of these four developments – high costs, poor compliance, high accident risks, and increased use – is a recipe for disaster. This is the macro-scale of the issue.

2. Should designers be involved? A micro-scale example.

An example can be used to hightlight some issues on the smalles possible scale. Figure 1 shows a detail of a package leaflet. Package leaflets is the legal term for the printed information that is inserted in every medicine package in the form of a folded leaflet or a minute booklet.

This example is taken from the website of the British Medicines and Healthcare products Regulatory Agency (MHRA). It is described as an 'improved patient information leaflet', because it has been tested in a 'readability test'. In such a readability test, two groups of 10 volunteers are asked 15 specific questions about this particular leaflet. The questions are related to the main safety issues and ask things like: 'If you have a very low blood pressure, could you take these tablets?'. If ninety percent of the questions are answered correctly, the leaflet is deemed 'readable' and passes the test (MHRA, 2007). This particular leaflet is shown on the website of the MHRA because it shows 'best practice'.

If you have angina, you may get chest pains when your heart cannot get enough blood. This usually happens during exercise or stress. Amlodipine helps to prevent this by increasing the blood supply to the heart. Amlodipine Tablets do not work immediately to stop the chest pain from angina.

2. BEFORE YOU TAKE AMLODIPINE TABLETS

Do not take Amlodipine Tablets if:
- if you are allergic (hypersensitive) to amlodipine, other calcium channel blockers or to any of the other ingredients in the tablets (these are listed in section 6, Further Information)
- if you have shock including cardiogenic shock (usually caused by a heart attack)
- if you have had a heart attack within the last 28 days
- if you are suffering from a disorder that affects blood flow through the heart
- if you are suffering from unstable angina (angina at rest or at night)
- if you are suffering from very low blood pressure (severe hypotension).

Figure 1. a patient package insert. The typography is poor (headings in bold italic condensed type, small linespace), the paper quality unsuitable (shine through), and the text hard to understand (long sentences, use of jargon). This makes package leaflets difficult for patients to read, to understand, to recognize symptoms and to draw correct conclusions what to do.

Despite of the readability test, patients are likely to have some problems with this leaflet. It is still very easy to point to some major flaws in the information in the package leaflet in figure 1. Three examples of user actions that might turn out to be problematic are:

1. Patients must understand this text: The first paragraph describes the 'indication' and tells the patient why these tablets are necessary: 'if you have chest pains, you can take Amlodipine Tablets, but they do not work immediately'. The text further suggests that Amlodipine 'prevents' chest pains. So, patients must take these tablets before they could get chest pains. But the final sentence states that the tablets do not work immediately. How good is the prevention in this case? As a patient, I would like to know when these tablets would start to work. Is it necessary to take these tablets for a very long time before any improvement occurs? This is confusing.

2. Patients must draw conclusions. The leaflet states that you must not take Amlodipine tablets if you are allergic (hypersensitive) to Amlodipine. That does look like sensible advice, until a patient asks: 'how do I know if I am allergic to this medicine? What would happen?' Unfortunately, that is not mentioned. There is no description of the signs that a patient could get and recognize if an allergic reaction occurs. This text does not make it possible to draw conclusions.

3. Patients must recognize symptoms. Several of the descriptions in the bulleted list cannot be interpreted by patients themselves. For example: 'if you have shock including cardiogenic shock'. A patient might realize that there is something seriously wrong and may be even realize that it is a shock. It is however unlikely that a patient is able to distinguish between a 'shock' and a 'cardiogenic shock'. A similar confusion occurs in the last sentence. The leaflet states 'very low blood pressure'. A patient might know – although even that is unlikely – that he/she suffers from low blood pressure. It is however unlikely that a patient knows if this is classified as a 'very low blood pressure', or just a normal 'low blood pressure'.

The three abovementioned comments are based on responses of people during readability tests with similar leaflets. These reactions are common: the package leaflet does make it difficult to understand, makes it difficult to draw conclusions, and makes it difficult – if not impossible – to recognize symptoms.

The time and effort that patients must use to try to understand this package leaflet is substantial. It is not a single patient, but many millions of individual patients who would struggle to decipher this text about Amlodipine tablets. An information source that is potentially valuable for patients is now in serious danger of being ignored because of the poor user experiences it has provoked in the last decades. People simply search for an alternative first, before they attempt to read the package leaflet. The leaflet is turning into legally required waste. This is the micro-scale of the issue.

3. What is stopping us?

If we want patients to act appropriately, and be able to take their medicines correctly we must supply correct and suitable information. Good information will not immediately reduce the increased use of medicines, but it is very likely that information is an essential ingredient to use medicines effectively and correctly. If patients and other users such as nurses, pharmacists and doctors receive optimal information, than it is likely that the compliance increases and the number of accidents decreases.

A second reason why it is necessary to supply information with medicines is that patients simply have a right to know. It is

ethically incorrect to give people a medicine without explaining why it is given and what the involved benefits and risks are.

For both these reasons, it is necessary to provide good information to people who handle medicines. However, it is difficult to describe what 'good information' exactly is.

There are several reasons why this unsatisfactory situation on both the macro-scale as well as on the micro-scale is not tackled. One of the fundamental reasons is the development of the current legal system. The legal requirements are described in European Directives (2004/27/EC and 2001/83/EC). All memberstates have the obligation to introduce these directives into their national legislation. The Directives seem to have five major problems:

a. The Directives put medicines first, and not people who handle medicines. All medicines are seen as equal and that causes that all information about medicines has to be identically structured. From a 'users point of view' that starting point is incorrect. Not all medicines are the same: some are used at home, some are used in operating theatres, some in emergency situations. A simple painkiller for single use in a domestic situation receives the same treatment as a anesthetic for an operation or medicines for very long term use such as insulin. Furthermore, there are many different ways to buy, administer, and store medicines.

b. The Directives show a poor understanding of a design process. The Directive seems to suggest that it is possible to separate writing, designing and testing. In practice, this is likely to be very difficult and detrimental for the end result.

c. The Directives are based on a conflict between 'user involvement' and 'structured contents'. It states exactly which information must be mentioned in which sequence, and it also makes user testing obligatory. However, if the results of the user tests indicate that the information content or the information sequence is incorrect in a particular situation, the results of the test must be ignored because the 'contents and structure must follow the Directive'.

d. The Directives only focus on artefacts, not on actions. The Directives describe exactly what needs to be stated on the package and in the package leaflet, but it does not make it possible to focus on what patients, nurses, pharmacists and doctors have to to.

e. The Directives only tackle parts of the problem. It does allow to involve all stakeholders. User tests only need to involve 'people who can imagine that they are patients', but it is not necessary to test information for pharmacists, nurses or doctors.

The main problem is that the Directives do not differentiate between medicines, users, actions, languages, and contexts. The current legal approach is known as 'a prescriptive approach'. It tells exactly what to do and it provides guidelines on how to do it. Unfortunately, it becomes more and more clear that 'one size does not fit all'. It is necessary to distinguish between medicines, users, actions, languages, and contexts and provide information that differentiates according to these factors.

Although the intention of the EU-legislation is clear and certainly worthwhile, it seems to have taken the wrong turn in the early 1990s. It is time to consider an alternative route before disasters on both macro-level and micro-level really occur.

4. An alternative approach

It seems essential to shift from a 'prescriptive approach' to a 'performance based approach'. The basis must be to provide information that 'enables users to act appropriately'. Fortunately, this phrase is already included in Directive 2004/27/EC (article 63, paragraph2). Three questions need to be dealt with to 'enable users to act approprately':

1. Who are the people that need to act? In which context are the actions take place at the moment?
2. What are the actions exactly? What do people need to do?
3. What do we consider to be 'appropriate'? When is an action successful?

The observation of current practice provides data about the ways in which people undertake activities related to medicines at the moment. User observations and contextual inquiries in hospitals, in pharmacies and in domestic situations are

undertaken with the aim to build a collection of 'user experience models' (Waarde, 2006). These models provide a basis for design developments and structure the involvement of stakeholders. They focus on the actions that people have to do and the information that would be helpful to undertake these actions.

The contextual inquiries, user observations and diagnostic tests also indicate that the design of information about medicines for doctors, pharmacists, nurses and patients is highly problematic in some specific situations (Waarde, 2005). Confusable medical packaging, poor instructions, hard to read package leaflets, conflicting warnings are fairly common when the design of information about medicines is analysed.

The inquiries also indicate that a lot of designed information does not seem to cause severe problems, but that some information is fundamentally flawed and needs urgent attention. It seems necessary to start with these highly problematic ones by providing information that supports people in their activities. After the observations, the actions and the people are defined. The third question of 'appropriateness' or 'success' needs to be answered too. In order to answer this question, it is necessary to involve all stakeholders to provide their views: what is an acceptable level of success? In some situations, the level of success must be 100%. For example when Vincristine – a medicine for the treatment of a bonemarrow cancer – needs to be administered. Vincristine must be injected into a vein, and not into the spine of a patient. If it is done incorrectly, it is lethal. Unfortunately, this 'accident' is fairly common. A 100% score of correctly administered Vincristine is therefore required. In other situations, it might not be necessary to aim for 100% scores. For some medicines, it might be acceptable to state that 'Ninety percent of the literate adults must be able to calculate the exact dosage' or even 'Seventy percent of the consumers of over-the-counter products must be able to dispose of the medicine correctly'. These actions and scores can be established for each medicine.

Of course, it is necessary to choose and investigate the most crucial actions first. That is where the user-experience models and contextual studies come in. After the observations, a hierarchy of actions according to their potential risks can be drawn up. The method of measuring is left open, as well as the way in which the message is designed. This leaves the space for people who test or observe the performance to choose the most appropriate methods, and it leaves space for designers and textwriters to develop information in the best possible way. Designed information is deemed appropriate if the required score is reached over a longer period of time. This makes it essential to monitor the actual performance in practice.

One of the consequences of the application of this approach in practice is that the legal system needs to be modified. The European legislation needs to move from a 'prescriptive approach' towards a 'performance based' approach. However, before the current legislation can be reconsidered, it is essential to investigate and validate alternative approaches.

5. Conclusion

The quality of the design of information benefits if it is based on sturdy user experience models. These methods to develop these models are available, and some of the necessary research has been done. One of the main things that stops us to provide good information about medicines to people is the current legal framwork. Within the current framework, the micro-issues issues will not improve. and only mediocre results can be achieved on short term goals. The macro issues – beneficial use, cost-effective use, reduced number of accidents – will not be achieved within the current framework.

About the author:

Dr Karel van der Waarde (The Netherlands, 1963) studied graphic design in the Netherlands (Eindhoven [BA]) and in the UK (Leicester [MA] and Reading [PhD]). He received his doctorate in 1994 for: 'An investigation into the suitability of the graphic presentation of patient package inserts'. In 1995, he started a design-research consultancy in Belgium specializing in the testing of information design. The company develops package leaflets, instructions, forms, protocols, and the information architecture for websites. The main focus is on information about medicines for patients, prescribing doctors and pharmacists. Karel van der Waarde frequently publishes and lectures about visual information. He is moderator of the InfoDesign and InfoDesign-Café discussion lists. The Avans Hogeschool (Breda, The Netherlands) has recently appointed

him as a scholar in visual rhetoric. It is a research post to investigate the development and use of visual communication with a longer term aim to support the relations between practice, research and education.

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black and white images sought to provide an immediacy and drama to the otherwise largely static scenes. Here, the so-called "devouring flames" (gōka) noted on the caption below left are added to the postcard photograph of the Kyobashi district. Adding the dynamic flames attempts to give the image a cinematic effect, yet its stillness speaks of an inability to re-enact the event in any temporal or visceral way—rather, it reinforces the irretrievability and silence of history.

Similarly, images of fleeing refugees, hand-tinted to communicate imminent danger and terror, while certainly evoking sympathetic fear and sadness in the viewer, are perhaps more striking because of their lack of ability to speak of the true nature of the experience.

New York Times

The world news reported the horrific body count and graphic photographs documented the gruesome scenes of mass incineration, while also singling out individual victims in the most gory and voyeuristic detail.

Postcard of Charred Bodies Honjo Depot

The former army Clothing Depot at Honjo (Hifukusho), one of the few open areas in the ward, was one of the single deadliest sites in the city. More than 30,000 people perished in this one site alone, a supposed sanctuary that became an inescapable tunnel of fire. The official earthquake memorial, which I will discuss in the conclusion of my talk, was located on the site of the depot because for the survivors of the quake it represented the acme of human suffering and loss, and hence the most appropriate site of memo ration. Photographic images of the depot show charred, dead bodies, heaped into mounds as if melted together into a single mass. The figures are undifferentiated, male or female, adult or child, they are merely an intertwined mass of human flesh. Such representations of mass carnage were repeated throughout the locales of the city, and render us into disaster tourists.

Postcard of Charred Bodies with the Living

The voyeuristic relationship between the viewer and the image, the living and the dead, is thrown into greater relief in this widely circulated postcard image of the pond in the (Shin) Yoshiwara licensed prostitution quarter, where thousands of women who worked in the brothels were known to have perished. Unlike the previous image, where the living are largely bracketed out of the scene, here the dead are clearly put in relation to the living, who seem to be gawking at the scene as they assist in pulling the corpses onto dry land—an impression exacerbated by the presence of the photographer. The eerie image of feet dangling over the edge of the waterway reads almost like spectators seated along the edge of the water.

Postcard of Yoshiwara

There is a latent irony in this image displaying death, as these women also lived their lives regularly on display for customers in the latticed showrooms (*harimise*) that lined the main street of the prostitution district. Here a sexual economy has been replaced by a scopic one.

Lithograph Shin Yoshiwara

Together with photographers, print designers were among the most prolific producers of earthquake images, although unlike their photographer colleagues, they were not tethered to the reprographic or the real in any way. This gave unbridled freedom to the imagination; often producing images that simultaneously represented the event as tragedy and thrill (not to mention miracle), one of the many ambivalences of the moment. These two lithographs from the album of 14 produced just one month after the quake by Ishikawa Shoten under the title *Pictorial Account of the Great Tokyo Earthquake* depicting the Shin Yoshiwara district and the miraculous salvation of Sensōji by Kannon in Asakusa both elicits emotions of terror mixed with excitement.

Kawasaki Shōko Print Clothing Depot

In these images, sites were notable for their spectacular--even sublime--state of ruin. Once again, we are reminded of the impasse of communication and silence engendered by the image of the ruin articulated by Cadava, but these images, and the ones to follow, bring up another problematic issue, one that Mark Dery asks in the subtitle for his article

"Terrible Beauty" which addresses the status of visual culture in the post-traumatic landscape after 9/11. He asks, "Does our humanity falter if we acknowledge an esthetic sublime in the visual façade of tragedy?" recognizing "the moral vertigo we feel when we gaze, rapt, at images of spectacular tragedies and simulated horrors, viewing the real and the recreational alike through esthetic eyes." Yet can such visual experience ever be entirely divorced from the aesthetic, as uncomfortable as it is?

Kawasaki Shōko's woodblock print of the ruins of the Honjo Clothing Depot set against the backdrop of a radiant sunset, evokes the long western tradition of Romantic ruins, such as those associated with German Romantic painter Casper David Friedrich. It is also a peaceful, sublime representation of the site of the most horrific loss of human life of the earthquake. Beauty and horror, shock and awe, go hand in hand.

Postcard Asakusa 12 Stories

Drawing on the Edo artistic genre of *meisho*-e, many images of the earthquake commemorated the disaster by immortalizing devastated locales throughout the city, focusing particularly on revered and iconic sites and structures. Commercially published pictorials offered pages of before and after photographs of ruined sites around the city, many closely linked with the establishment of the modern nation-state in the Meiji period and the state's overriding ideology of "civilization and enlightenment." Yet these domestic and international mass-market photographs of the quake explicitly called into question this ideology of progress. Locations particularly associated with the modern city, such as the Asakusa district skyscraper Rounkaku, commonly known as the "Twelve Stories" (here seen in a postcard before and after the quake), which cracked at mid elevation, became emblematic of the fragility of man's technological achievements in the face of the indomitable forces of nature.

Asakusa "12 Stories" 3 Images

The aestheticization of the devastated form of the twelve-stories took many forms: the building captured in the midst of incineration by Okada *Saburōsuke* (1869-1939) in Asakusa Twelve Stories Building on Fire (*Moetsutsu aru Asakusa Jūnikai*), which was then itself emblazoned on the cover of the October 1923 issue of the popular magazine *Shufu no tomo* (Housewife's Companion); in photodocumentary images as a forlorn ruin, decapitated with its steel rebar drooping pitifully to its sides; or in Isoda Chōshu's woodblock print as an abstract, colorful ruin as still life. There was often a close visual connection between photographic, print, and painting representations, an inter-media dialogue, if you will.

New York Times Headline

The New York Times headline that ran on September 4th "Princes and Statesmen lie dead with the Poor," underlines a frequent observation from all sectors, nature pays no heed to class. An assertion that according to Alex Bates, displaces the disproportionate suffering of the poor in the disaster due to pre-existing socio-economic inequity onto the uncontrollable whim of nature.

Empress of Japan

The seeming eradication (at least temporarily) of class divisions was alluded to in a caption on a much reproduced photograph that in read: "Calamity obliterates class--The Empress of Japan among her earthquake stricken people," which featured the Empress visiting injured, and possibly orphaned, children—an image of benevolent imperial rule harking back to the Russo-Japanese war. The message was clear. The nation would unite in tragedy and together face the task of reconstruction. A marked surge in samaritanism could be correlated with what scholar Allen H. Barton has termed the post-traumatic "altruistic community."

New York Times Headline "Food Riots"

There was, however, a savage underside to the event in the wake of the devastation and in the reestablishment of order, which, while commonly known at the time did not often make its way into standard "beautiful stories" (*bidan*) of Japanese heroism. Not only were there food riots and looting, but there was a widespread vigilante rampage against Korean nationals, Japan's colonial subjects, (and other foreigners believed to be Korean, like Chinese) residing in Japan who were wrongly accused of acts of sabotage during and after the disaster. Massacred by the authorities and civilian mobs, their bodies

laid strewn on the streets for all to see. The shock over these brutal actions was frequently expressed in artistic and literary accounts of the quake—although not surprisingly they were not often pictured in news coverage.

As Timothy Brown has noted, there can often be a paradox in the confronting of a traumatic past. "The desire to bring forth "positive" forms of identification (heroic memory) can occur at the expense of working through a painful and difficult past." Rather than the "altruistic community," the Kantō earthquake trauma, then, might be seen as more representative of what sociologist Kai Erikson witnessed in his case studies, where "disasters forced open fault lines in the communities," producing what he alternatively terms "corrosive communities".

CONCLUSION

Earthquake Memorial Complex Aerial

In the late 1920s, after many years of slow and painful reconstruction, the Tokyo Municipal Government began plans to erect a memorial complex to the earthquake victims on the site of the Honjo Clothing Depot. The well-known historicist architect Itō Chūta, professor at Tokyo Imperial University, was commissioned to design a Buddhist memorial hall and a Reconstruction Commemorative Museum, the latter of which was to house photographs and artifacts from the disaster. Museum and memorial spaces serve not only as spiritual sanctuaries, but provide a kind of "pedagogy of trauma," which Timothy Brown has rightly described as including more than just "description and narration" of the event, "but also artifacts and exhibit spaces that bear witness to the unrepresentable."

Itō designed the steel-reinforced concrete Memorial Hall in a distinctly hybrid architectural rhetoric that draws from both East and West, as was common in his work of the time. The basilica-like cruciform layout is reminiscent of Christian cathedrals, but the continental-style stupa shaped finial sitting atop a pagoda-like tower, set behind a tile-roofed, hip-and-gable building, most strongly evokes images of the ancient Japanese Buddhist temples that Itō closely studied and helped reconstruct in Kyoto and Nara.

Ireido Buddhist Memorial exterior

In front, a prominent portico with a Tokugawa shogunal-style cusped gable projects outward to cover the dramatic entryway. The building enshrines the bones of thousands of victims in the stone base of the pagoda tower—functioning as a reliquarium—even perhaps a martyrium—and it is said that incense has burned continuously in front of the altar since four days after the disaster. Memorial services for the dead are still held here annually on the anniversary of the quake.

Ireido interior

And the interior is equally eclectic, combining a Buddhist altar and a western-style devotional space with pews on a tile floor. Illuminated by electric chandeliers and sconces, the central space is ringed by a lower tier of documentary photographs and an upper tier of large-scale oil paintings by academic painter Tokunaga Ryūshū memorializing individual scenes, which, by that time, had already become iconic of the disaster, such as the crumbling image of the Asakusa Twelve Stories Tower.

Reconstruction Hall

In the Secessionist-style Reconstruction Commemorative Museum, rows of scorched and deformed material remnants of the earthquake are exhibited amidst photodocumentary and artistic representations of the event. This mode of memorial representation and display has formed the basis for memorializing subsequent catastrophes in Japan such as the Great Fire Bombing of Tokyo at the end of World War II in 1945, which is now displayed in the same complex side-by-side with the earthquake, and perhaps more well known, the memorialization of the atomic bombing of Hiroshima in the Peace Memorial Museum. This process has gradually elided the distinction between natural and man-made disasters.

Reconstruction Hall—2nd floor gallery

I would like to conclude with a close look at one large-scale oil painting on the second floor of the Museum that sits amidst a series of small-scale paintings of devastated locales throughout the city, kitty-corner from images of the crown prince and

empress surveying their traumatized imperial subjects, and across from aerial renderings of the Kantō region in flames.

Arishima Ikuma Painting

Narrativizing the total earthquake experience, well-known modernist painter, Arishima Ikuma's (1882-1974) monumental oil on canvas, titled Impressions of the Great Disaster (*Daishinsai no Inshō*, 1931), situates itself in retrospective temporal relation to the event providing a cumulative summary of the totality of the iconic moments of the experience (all of which evolved out of and were crystallized by the visual production I have been discussing). It condenses the disaster into a unified visual collage--a simultaneous moment of misery, memorial and mission.

The elaborate composition, evocative of Christian images of resurrection, reads from left to right, sweeping from nightfall to daybreak. Although the first tremor occurred near noon, in Arishima's imagined conception the night becomes a metaphor for the darkness of the experience and morning symbolizes the onset of reconstruction. On the distant left, the decapitated Twelve Stories stands aflame next to savage firestorms whipping overhead that carry off people and souls to heaven. In the immediate foreground naked women stand or crouch in front of barracks desperately trying to wash themselves in buckets of water, an image familiar to all from contemporary photographs like the one you saw earlier. A myriad of men, women and children mill in the middleground salvaging their possessions or tending to the injured or dead; others just sit in disbelief. Two figures in the center, a barefoot man carrying a shovel with his back to the viewer and a woman in kimono dragging her belongings along the ground, lead the eye to the new day where a host of officials stand surveying the damage.

Arishima painting and detail

On the far right, the newly installed Prime Minister Yamamoto Gonnohyōe and former mayor of Tokyo Gotō Shinpei appear on the scene ready to begin the task of reconstruction. Appointed as Home Minister after the quake, Gotō played a central role in orchestrating the rebuilding of the city, some of his actions, particularly attempts to repossess private lands for public works, were considered quite controversial. Arishima's scene is fraught with ambivalence, however, as it includes the figure of murdered anarchist Ōsugi Sakae, shown in a panama hat to the far right. Ōsugi was a popular leftist activist brutally murdered along with members of his family after the quake by military police, and his tragic death became a symbol to the intelligentsia of unrestrained authority gone awry. He stands in Arishima's painting as a reminder of the human and moral cost of the disaster.

To borrow the words of Benjamin, Arishima's image is "loaded to the bursting point with time", as "the traces carried by the image include reference to the past, the present, and the future, and in such a way that none of these can be isolated from the other..." Thus, through the prism of this cumulative visual production of the Great Kantō Earthquake, temporally collapsed in Arishima's painting, we are left with an image of this calamitous event as both devastating and renewing for Tokyo and its inhabitants. Out of the ashes emerged a powerful visual response to the experience that expressed the spectacle of disaster, the sublime nature of ruin, a commemoration of unspeakable tragedy and loss, an ennobling of everyday life, and a fervor for the possibilities of reconstruction. People mourned loss and celebrated solidarity, all the while repressing the inequitable and corrosive aspects of community manifested by the catastrophe.

VISUALISING DISASTER: ENVIRONMENTAL ANXIETY AND THE URBAN IMAGINARY

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Abstract

The form of cities, their design and construction have long made it possible to think about human society. Likewise, the destruction of cities through various means, accidental circumstance or human error, and the representation of urban ruin have given historical, visual and narrative form to diverse values governing ethical conduct, individual desires and collective responsibilities. Recently, a spate of films in which cities are destroyed by natural disasters have been counterpoised by images of such events as earthquakes in Qom and Pakistan, the tsunami-driven wreck of regions of Southeast Asia and the inundation of New Orleans. Both fictional and documentary representations of disaster are mutually reinforcing. They not only invoke, though fail to encompass, the immensity of suffering accompanying the fall of one or the other city. They are also highly evocative and symbolic, representing (equivocally, no doubt), the end result of a series of causes and effects for which no one person is likely responsible, on the one hand, and a call for fortitude and renewal in the face of great adversity, on the other.

Taking its cue from representations of fallen cities and the possibilities they engender for thinking about the meaning of disaster this paper will consider how their portrayal serves as a vehicle for questioning our seemingly precarious relationship with nature and the future of the city. It concludes with mention of one recent attempt to represent urban ruin, Robert Polidori's photographs of New Orleans entitled After the Flood.

Introduction

This paper grew from a first, passing interest in the literary and cinematic portrayal of urban disaster and subsequent writing (Taylor, 2006) on the meaning of such representations for an understanding of ethics and human values. The appearance in recent years of a spate of natural disaster films like *The Day After Tomorrow* (2004) and *Volcano* (1997), each casting the city as a prime target for cataclysm, is notable in this regard. The appeal of these films might be understood in view of present day environmental uncertainties or the apparent state of anxiety in the world more generally. However, their coincidence with documentary coverage of very real cataclysmic events leads us to question how representational media engage with the complex reality of a fallen city, the circumstances which bring such events about and their human and social costs.

This paper affords an opportunity to reflect further on urban disaster and its representation. In addition, our paper is also part of a more extended and detailed study of transience and the built environment (Taylor and Levine, 2006), an initiative undertaken this year with the support of the Australian Research Council. The study considers the ways that an

awareness of urban change of lesser or greater magnitude (phenomenal transience) encourages reflection of a more abstract kind – of the complexity or incomprehensibility of modern life, for instance, or the vulnerability of that life and the inevitable passing of all things (existential transience). Both phenomenal and existential understandings of transience are brought into sharp relief by representations of urban disasters as well as more everyday or 'ordinary' manifestations of change. Transience is given narrative form by cinematic and documentary films which cast the city as a stage for momentous events, just as it is implicated in more static and two-dimensional images of fallen cities. The Jan T. Kozak Collection at the University of California at Berkeley provides an opportunity for viewing the latter. It is an online archive comprising several hundred images of allegorical and historical earthquakes, largely portraying their impact on cities in times past, from Sparta, in ancient Greece (destroyed 464 B.C.) to Messina, in Eastern Sicily (1908).[1] Many of these images are intended to capture the moment of disaster as though to encompass in a single frame a chain of events culminating in catastrophe. The collection of digitised woodcut prints, lithographs and paintings are telling, not only of the longstanding impact upon the western imagination of urban disasters, but of the particular concerns and values brought to bear on such representations relative to a given period.

Our paper will engage both sets of issues - the representation of urban disaster, on the one hand, and transience in its phenomenal and existential guises, on the other - by identifying two related issues which underlie both. It is firstly and primarily concerned to outline an ethical domain brought into view when cities are destroyed though either natural or human circumstances (though the distinction can itself be telling of particular value systems). Secondly, the paper questions the possibility of a *tabula rasa* that presumably follows disaster – an imaginary, hypothetical state that represents the life (or death) of a city as though it were a moment frozen in time, the city being an entity either imminent or ultimately extinct. It is a moment which prefigures a city's regeneration by providing a starting point to begin re-ordering the metropolis or designing it anew. In literature and film, fictional sources, but also more 'factual' or documentary ones, the occasion of an urban disaster provides a pretext for thinking about this hypothetical state, this 'blank slate' or moment out of time. Robert Polidori's photographs of New Orleans in *After the Flood*, the title of a recent exhibition at the Metropolitan Museum of Art in New York and book (Polidori, 2006) are an evocative reminder (a 'psychological witness' in the publisher's words) of the lives interrupted when the fabric of a city is destroyed (even though no people are shown), but which must continue, somewhere - somehow. They are also a wake-up call to governments, urban planners and architects alike of what is at stake when such an event occurs: the forms of social stability, security and yes, even 'normalcy' the built environment can engender. If, in the end, buildings and cities are not that determining of human behaviour, they are nonetheless the material from which hopes for a better future –for ourselves, our children and society, more generally- are commonly formed. We would argue that just as it is unlikely that any one image or film can fully capture in a single frame or narrative the immensity of human suffering resulting from an urban disaster, fallen cities are never ones that are fully erased - though there may be usefulness in presuming that they can be.

The meanings of urban disasters

Long before the popularisation of science and the arrival of film, historical (biblical, allegorical and artistic) sources revealed the city to be an important vehicle for thinking about human values, particularly where the circumstances occasioning the destruction of cities have allowed for varied assessments of the capacity of society to accommodate rapid and oftentimes dramatic change. Stories describing urban disasters, some entailing the dispersal of entire peoples as a result, form a recurrent theme within the Judeo-Christian tradition. Illustrating the workings of divine justice, they commonly entail assertions of a stark divide between right and wrong and between causes and effects of a certain, moral kind. Biblical accounts of *The Tower of Babel* and the twin cities of Sodom and Gomorrah are telling in this way, while their portrayal throughout the history of Western art reveal variations on a theme. Consider one of the earliest known portrayals of the Tower of Babel on an ivory panel carved

[1] Jon T. Kozak Collection, University of California at Berkeley online website; URL: http://nisee.berkeley.edu/kozak/index.html (Last accessed 7 January, 2007).

sometime between the years 1050 to 1080 at the cathedral in Salerno (Italy) where the representation of building detail is secondary to the oversized figure of an omnipotent God who appears descending from heaven to disperse the tower builders across the earth. Contrast this image with Pieter Bruegel the Elder's well-known painting of The Tower of Babel executed five centuries afterwards (1563) and one finds a more secular scene and significance attributed to the story. In similar illustrations of this latter period, an emphasis on the details of construction (less on destruction *per se*) transforms the Tower into an immense hive of human industry and common purposes emblematic of the city itself.

More recently, and reinforcing the durability of the tower as an architectural trope, one commentator, writing on media coverage of 9/11 and its aftermath, has described the particular symbolic potency of the collapsed Twin Towers of the World Trade Center as representing the heights of human capabilities and civilisation, a take reminiscent of Bruegel's painting. For Samuel Weber (2002) the form of what was once the world's tallest buildings are conveniently counterpoised to the Caves of Tora Bora which were likened during the Afghanistan War to the refuge of the depraved. Coupled with the simplistic and self-serving views of George Bush and his neo-conservative supporters, these opposing symbols accentuate an imaginary world animated by forces of good and evil and stripped of any social, cultural or political nuance – a world, consequently, de-historicised as well. Judging by details of Bruegel's masterpiece, however, the painter would most likely not have understood this limited view of human society for *The Tower of Babel* is full of stylistic references to historic architecture and communicates a sense of the necessity of culture as well as its vitality.

Turning to the account of Sodom and Gomorrah one finds prefigured there longstanding and complex associations between urban living and the threat of a moral corruption for which city life is both the cause and the cure. The opposition of a potentially, socially-cohesive culture and indistinct wilderness features prominently in the biblical story of the fall of these cities. Titian's depiction of the story titled 'Pastoral Scene' or 'Landscape with a Sleeping Nude and Animals' (1565) illustrates for one art historian (Mellinkoff, 1998) a less than idyllic scene with the biblical episode with burning city, rural village and wilderness occupying back, middle and foreground of the drawing. The innocence of lambs accompanying the sleeping figures contrasts with the goat and boar amongst the flock which signify lust and lechery. Significantly, according to the biblical account, following the destruction of the places of wickedness, Lot's incestuous liaison with his daughters occurs as he leaves the small town and social intercourse behind entirely and takes up residence in a cave in the woods where he lives like a beast, figuratively and morally.

In contrast to the story of Sodom and Gomorrah, Babel was not so much destroyed as were the ambitions of its builders thwarted; however, it was equally a site of divine intervention in the lives of humankind, particularly where human life was understood in terms of a divinely-endowed capacity to transform nature for human purposes. This particular understanding informs a pre-ecological view of the natural world known as 'resourcism'. Resourcism and ecology incorporate different views of the domain of animate and inanimate matter –making of nature a register (though not entirely a blank slate) of a kind- upon which human actions are recorded and human agency, capabilities and limitations inscribed.

Turning to other sources for thinking about the meaning of urban disasters, for the ancient Greeks, the city represented both the manifestation of civic virtues and the means for propagating them. The 'urban' was as much a process as it was a state of existence. Understandably, the fall of the *polis*, a common enough occurrence in a world of city-states and rival trading powers, would come to represent an event of historical and moral significance as profound as the destruction of a Sodom or Gomorrah. Given the legacy of ancient Greek and Roman civilisations and the spread of their monuments and remains of public works across Europe, it is no wonder that the rise and fall of cities like Sybaris (510 B.C.) or Selinunte (409 B.C.), then Pompeii and Herculaneum (79 A.D.) -like the decline of Rome itself- have long fascinated historians, writers and artists. Equally, the discovery of ancient sites, the incorporation of their spoils or their reproduction and adaptation have inspired at various times in the past new thoughts on architecture and urbanism.

Though images of Babel and Sodom or ruins, as found at Selinunte and Pompei, figure prominently in the imagination

of disaster, it would be misleading to think of the values attending a state of urbanity as manifest only in urban forms, however these may appear. Likewise it would be a narrow view that considers the opposition of tower and plain (Babel) or civilisation and chaos (Sodom) to be best represented by scenes of devastated cities. Writers and artists have called upon other kinds of images of disaster to depict either the vulnerability or resilience of human society. Two exemplary cases are Théodore Géricault's portrayal of shipwrecked survivors on The *Raft of the `Medusa'* (1B19) and William Strutt's painting of a cataclysmic bushfire in the Australian outback entitled *Black Thursday* (1B51). In Géricault's documentary, though still, largely allegorical painting, suffering, madness and death are part of the natural world for nature, like the sea, is imagined to be a formless and potentially malevolent entity upon which human dramas unfold. William Strutt's painting is not only composed in an equally spectacular manner, but tells a similar story. The bush is not only indistinct and threatening like an immense ocean where fire rolls across the plain in an all consuming wave, it also represents a space that is opposed to civilization and must ultimately be confronted and conquered. Characterising humankind's engagement with nature as one of a contest, there are intimations of resourcism in both paintings, though any positive advantage to be had by travelling the seas or settling remote wilderness is undermined by the threat posed by exposure to raw nature and ultimately, the limitations of human technology and society to subdue it. Given their moralising and apparently, mixed messages, in other words, the paintings appear both old and new when viewed together.

Separating in time the images of Titian and Brueghel, on the one hand, and those of Gerricault and Strutt, on the other, the *Philosophes* of the eighteenth century, then the social reformers of the nineteenth, gave a more reasoned form to allegorical representations urban disaster. Jean Jacques Rousseau and his contemporaries sought a rationale for understanding both the necessity of the metropolis and the unhealthy prospect of life there in which chaos was a constant, though indistinct threat and where the 'wilderness' of moral deprivation could be found anywhere, both within city walls and without. Commentators established an association between living in closely-knit communities and human degeneracy with some claiming that the 'town-bred' possessed a 'narrow chest, pale face, weak eyes, and bad teeth' while others pointed to the superiority of those living in rural environments. The determinants of moral behaviour were also discovered in the urban environments of the period and, along with ill health, decrepitude could depend upon the state of one's climate, diet, drink, idleness, cleanliness, silence and even access to music. Religious apathy and rioting became symptoms of social ills along with other aspects of personal behaviour. Social critics were essentially urban theorists as Augustus Pugin, William Morris and Jeremy Bentham imagined ideal cities as alternatives to the deplorable state of the metropolis. Thinking about the ideal city entailed a process of abstraction, a stripping away of all that was deplorable about present living conditions in preference for alternatives derived from reason and the imagination. In this, more secular age, Sodom could denote any extremely wicked or corrupt place where physical and moral depravities occurred. It became a particular kind of environment that defined its inhabitants just as, for both natural theologians and fledgling evolutionists of the period, a place - its geography and climate - defined the creatures that lived in it. For one eighteenth century Londoner, 'A Tavern is a little Sodom, where as many Vices are daily practic'd [sic], as ever were known in the great one' (OED, 19B9).

In the end, the form of cities, no less so representations of their destruction, have provided a means for thinking about human identity, society and values – the potential for and limitations of human capabilities for manipulating nature and ultimately, the relationship of our species to the world of animate and inanimate matter. To a certain extent one is grappling with the old nature and culture divide here. However, we are not so interested here in hackneyed dichotomies or abstract philosophical issues as with a style of reasoning that comes with thinking about the built and natural environments in a manner distantly related to the thoughts of the Rousseau or Bentham, though more developed and obviously characteristic of our own times. One can argue (Taylor, 2004:95-119) that a uniquely modern and ecologically-nuanced way of thinking about our surroundings is related to particular patterns of sentiment, perceptions and anxiety organised around the city. What is interesting when considering past sources for contemplating disaster, something akin to our understanding of the environment does not exist at all. Recent representations of urban disaster, particularly in science fiction and on the screen, though distantly related by earlier ancient, biblical

or allegorical catastrophes, are not entirely encompassed by them. Rather they owe more to this environmental way of thinking.

Consider the spectacular visual effects of films like *Armageddon* or *The Day After Tomorrow* or their precursors in 1970's blockbuster movies like *The Poseidon Adventure* or *The Towering Inferno*. Whatever one thinks of the quality of such films with their overblown special effects and nearly, always predictable storylines, it is interesting to question how they engage with the other kinds of narratives accompanying the rise of empirical science and its fictionalisation, particularly since the time of Darwin. These narratives entail language of causes and effects, actions and reactions whereby everyday physical phenomena and potentially cataclysmic events are understood in terms of underlying natural forces – allowing for the possibility that these may be interfered with, for better or worse, by humankind. These narratives raise questions of the predictability, likelihood or inevitability of one or the other natural event – the degree to which one can predict the weather, for instance, or of the likelihood of an earthquake, a typhoon or tsunami. These narratives delimit an ethical domain whereby human actions enter into equations determining a range of phenomenon impinging upon its designs – actions modelled along, as Immanuel Kant would write, the 'oscillations of the weather and biological and other natural phenomena.'

These words are taken from an essay Kant wrote in 1784 entitled, 'The Idea of History from a Cosmopolitan Point of View' (cited in Hacking, 1990:16) in which the author described the unfolding of human actions in the world to be as predictable, if not as obvious, as the facts of life and death – even the weather. Whereas in the natural world, the passage of time was registered on the bodies and forms of animate and inanimate matter, in the human world, it was, for Kant and many who followed a similar line of thought, the city upon which was written the movement of history. Kant's essay prefigures a significant shift in the visualisation of urban disaster, where fallen cities become seen not so much as a consequence of divine wrath or conception of an unforgiving natural world that followed the fall of Adam. The former remained the view of many, for instance, when contemplating a momentous and highly publicised event like the earthquake that destroyed Lisbon in 1755, just 30 years before Kant wrote his essay. It remains the view, but only for some fundamentalist Christians in America in view of Katrina's makeover of New Orleans, 221 years later – a consequence it was claimed of the city's 'embrace of sin' (reported by Dewan, 2006). Rather, this shift in the imagination involves a move towards a more scientific and causal understanding of such phenomena, whereby human responses to disaster move away from forms of penance as in a less secular age and towards a calculation of probabilities and likelihoods whereby natural, cataclysmic events become understood in new and complex ways.

In view of the long history of destroyed cities and the changing patterns of sensibility that have determined their significance for human society, an important development coincided with the rise of empirical sciences. Varied sciences, from those more immediately concerned with an abstract understanding of nature like chemistry and physics to others more obviously aimed at predicting and controlling natural forces - like geophysical sciences (including seismology, meteorology and hydrology), building statics and engineering - have played a role. Though concerned with different objects of study, these fields commonly bring into play a form of causal reasoning and an encourage awareness of the myriad of forces and counter-forces acting upon the city. In application they can privilege a language of urban forms and their functions cast in quasi-biological terms. Consequently, the city is understood in relation to observations of organic and inorganic nature, nature's constituent elements like earth, air and water. Understanding, predicting and reacting to the forces that act upon a city and which make it a part of the geophysical and organic worlds – invoking a broad kind of environmental awareness, basically – inculcated a particular understanding of buildings, the sites upon which they stood and the cities of which they were a part.

Bringing the preceding claims for environmental awareness to bear on debates over the cause of the destruction of New Orleans in the wake of Hurricane Katrina, much rested on the characterisation of the event as being either a 'natural' or 'human' disaster – crucially the availability and amount of reconstruction funds from insurance and governmental sources essential for building any vision of a renewed city. Disagreement arose from an emphasis on either a storm of unprecedented ferocity, on the one hand, or storm protection and civil defence systems that had proven inadequate, on

the other.[2] While Kant would have understood some terms of this debate (the cause of one phenomenon, either naturally or humanly-generated, resulting in another) and Darwin, appreciated the generative force unleashed by destruction, neither figure would have likely countenanced a government that could abandon a city in such a way. By the time Katrina struck New Orleans and the levees collapsed, decades of neo-liberal ideology and economic-rationalist policy in America (as elsewhere) had transformed 'the city' into a *tabula rasa* of an unprecedented kind. It became a blank slate upon which not only natural forces, but a hypothetical and all-encompassing free-market (which largely amounts to the same thing as nature in extreme versions of this theory) did their work, independent of most forms of human 'interference'. In the wake of Katrina these would seem to include such interventions as public investment in urban infrastructure, the limitation of oil exploration and industry which damaged wetlands and protective coastal islands and the regulation of a largely, uncontrolled insurance industry.

Existing alongside and partly accounting for the rise of economic rationalism, environmental awareness also accounts for the evocative charge of more recent representations of urban disaster - like those of photographer, Robert Polidori - than those previously described in this paper. Their human dimension, played off against the background of a natural one, is particularly obvious in director Spike Lee's recent documentary film *When the Levees Broke* (2006). Environmental awareness has a profound influence on the way we approach buildings sites created by cataclysm – or it should – even though some designers may not take full stock of its philosophical origins and ethical dimensions. Accounting for developments occurring over the past two centuries, our interpretation of scenes of disaster and our response to the cities left in their wake today have been formed from our simultaneous, self-conscious occupation of the built and natural environments – a feature of modern life in the metropolis.

Robert Polidori and *After the Flood*

Robert Polidori's photo essay *After the Flood* (2006) provides a fitting set of images to conclude this paper. Having previously made subjects of such phenomena as the slow decay of Havana, the bombed out remains of Beirut and the abandoned, contaminated cities of Chernobyl and Pripyat, he turned his camera on New Orleans in the weeks following its inundation in late August, 2005. His photographs, mainly of the ruined facades and the interiors of houses, capture not so much a moment of disaster, but the multiple and complex interactions of so many organic and inorganic 'events' initiated when the city's levees broke. They portray the interruption of innumerable manifestations of human activity. The scenes are chaotic in one sense – compositionally - though invite one to imagine what happened, logically and predictably, after the waters rose, then subsided. The scenes are 'alive' in this sense as there appears considerable evidence of warping, rotting and mildewing, all presumably still going on at the time the photographs were taken. They are also static given the staged character of the photographs which, though random in their content of overturned and decaying furnishings, are conventionally executed from fixed vantage points, the framing of shots and considered lighting. An architectural photographer's desire for images free of people was already satisfied by the depopulated state of the city, rather than any obvious action on the part of Polidori.

The photographs comprising *After the Flood* are noteworthy in that they are not concerned with communicating obvious or dramatic action which, conversely, characterises many of the images in the Kozak collection and other, allegorical and historic representations of urban disaster. They are composed, but not heroic in the sense that old woodcut prints, lithographs or paintings of collapsing buildings, turbulent seas or raging bushfire scenes or the statuesque victims and survivors who people them are. They are perhaps (if any photograph could be) more Darwinian than a Gericault or Strutt painting could have ever been.

Nurturing an unsettling fascination for the abundance of furnishings and goods, materials and surfaces that comprise the everyday interior of the home, the photographs reveal invisible forces of decay working upon them. Polidori's scenes deal with

[2] The latter assessment, incidentally, was recently confirmed as true following a review by the United States Corps of Engineers.

a reality of 'overcrowding, waste and disorder' that concerned Darwin and his followers and which provided the worldview behind theories of cataclysmic upheaval and natural selection. Equally, the viewer's absorption in the minute detail of the images –the innumerable instances of ruin- is counterpoised by fascination with the wholeness and the plenitude of nature that inspired theologians and artists in early- or pre-modern times as well as its seemingly irresistible force (Levine, 1988: 34-39). Providing the logical counter-image to the Victorian home, in that chaos supplants an idyll of domestic order and bliss, the photographs portend a reality of 'randomness and chance' (Taylor, 2004:205) characterising modern life, all the while calling on our expectations of order to heighten their dramatic impact. Above all the photographs engage with an environmental sensibility portending modern life –entailing in its most basic terms, an awareness of particular spaces, streetscapes and rooms as unique, portentous and formative of human identity, character and well-being- the latter, now obviously lost.

Informed viewers (and hopefully, all Americans especially) approache these photographs with knowledge of one aspect of their context and New Orleans itself, namely that the city largely rests below sea-level. This alerts one to the possibility - now the certainty according to government officials in the US Army Corps of Engineers - that the cause of the disaster was not entirely 'natural'. The storm left the city relatively unscathed after passing over it, though Katrina's waters, working on a poorly maintained Hurricane protection system caused the levees to collapse. The city's pumps, once the largest in the world and the pride of a robust civil engineering and public service sector, failed to deliver as they were but barely operational. And, of course, the broader issue, global warming, which may have spawned so large a storm in the first place furthers a sense of uncertainty about the photographs.

Conclusion

Polidori's photographs seem to confirm at least one conclusion drawn from the study of urban disaster (Taylor, 2006:611). Like the narratives of recent disaster films, the images invite a particular kind of discernment. They invite us to distinguish between what we see and most likely know and what we do not see, but suspect. Accompanied by extensive press coverage and conflicting evidence regarding the cause of the inundation of New Orleans, the images draw upon our knowledge, however, incomplete, of 'causes and effects, actions and reactions whereby everyday physical phenomena and potentially cataclysmic events are understood in terms of underlying natural forces' in which humankind has had a hand. Part of their dramatic effect (and providing for their moral content) is based on the exploitation of uncertainty that has always accompanied the expansion of science and our reliance on standards of objectivity as a means of explaining things. These standards account for a certain ambiguity in assessing either the 'artistic' or 'documentary' qualities of the images. Uncertainties, those threatening the city and others holding out promise of its salvation, serve to position us all, the urban dwelling and cinema-goer, as potential victims or heroes. In the end, it is the city that provides a backdrop for a complex view of our relationship to nature and to each other.

The various historical sources and images cited in our paper have helped cast urban disasters as morally significant while opportunities for rebuilding cities like Lisbon and San Francisco, London and Berlin from the remains left by earthquakes, bombs and firestorms have encouraged reflection on what an ideal city and society might be. While in some instances, particular circumstances may have rendered a city uninhabitable, necessitating its complete demolition or abandonment, it is more common to find in history (unlike scripture) instances where disaster has been followed by the promise of opportunity just as, again commonly, the building sites created through devastation, are rarely rendered entirely blank. The multivalent structures of human society and so too, human agency, do not necessarily or entirely coincide with the physical structures of buildings and urban forms so that in destroying the latter, physical ones, the former inevitably disappear as well. For every destroyed city in history that may be reborn in some novel form there are many others that have resisted wholesale transformation for some social or cultural, economic or political reason.[3] Tellingly, the inability

[3] While Noto (*Nuovo*) in Sicily was rebuilt on an entirely new site and given a 'modern' (ie, Baroque) form following its (*Noto Antica*) complete destruction in 1693, the rejection of Christopher Wren's radical new plan for the City of London following the great fire there in 1666 and its reconstruction along existing Medieval street lines exemplify the later, contrasting case.

of authorities to raze the largely, wholly destroyed, lower 9th Ward (district) of New Orleans in the wake of Hurricane Katrina –despite common sense and the best advice of engineers and planners– was due to such reasons.

Popular, disaster films are rarely concerned with such a view of the social and political complexity of cities. Films, particularly American ones, view urban disasters as a means of separating out a few heroes from the many, largely complacent victims of cataclysm. Generally, disaster films work as though the immensity of human suffering following a given, cataclysmic event can be captured by a single narrative or frame and understood – perhaps even 'experienced' by the viewer. The possibility that such representations can in fact convey an experience or promote empathy with those who suffer brings to mind our own aspirations for a new city in that both, both empathy and aspiration, require an act of the imagination.

It is the idea of a tabula rasa or blank slate, but also the imagination that brings both phenomenal and existential forms of transience together. In other words, when viewing the remains of vanquished cities, whether the crumbled and charred remains of San Francisco depicted in period lithographs or the collapsed and rotting remains of New Orleans interpreted by a contemporary photographer like Robert Polidori, the mind is drawn to imagine what was once there and what might yet arise. Our thoughts are drawn to contemplate the complexities of life in the modern metropolis, and perhaps, even the inevitable passing and possible transformation of all things.

Given certain historically, socially and culturally-prescribed limits, namely those governing recent disasters like the near complete destruction of New Orleans, cities and buildings sites can never really be, tabulae rasae – at least not entirely or in the way designers might like to see them. More than likely, the idea is linked to self-serving purposes – one being to divert attention from the circumstances leading to the cataclysmic event itself and any liability for what follows. Consequently, the aspirations of urban planners, architects and designers called upon to inscribe them a new –and our desires, as citizens who want closure and to get on with life– must be take this important dimension of urban disaster on board.

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