Design and semantics of form and movement : DeSForM 2008

Loe Feijs, Martina Hessler, Steven Kyffin, Bob Young

Design and semantics of form and movement

DeSForM 2008

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Design and semantics of form and movement

DeSForM 2008

Program DeSForM 2008

Hochschule für Gestaltung Offenbach am Main

Thursday, November 6th

11.00	Registration (please bring registration fee in cash).
12.00	Informal lunch (drinks & snacks)
	Welcome and opening
13.00 - 13.30	Bernd Kracke, President, HfG Offenbach
	Peter Eckart, Dean of the Department of Product Design, HfG Offenbach
	Steven Kyffin, Philips Design, Eindhoven, The Netherlands
	Martina Hessler, Product Design faculty, HfG Offenbach
	Plenary lecture
13.30 - 14.15	Peter-Paul Verbeek, University of Twente, Enschede, The Netherlands
	Of signs and things. Some reflections on meaning, mediation and morality
14.15 - 14.30	Coffee break
	Poster & demo presentation
	Chair: Steven Kyffin
14.30 - 15.00	Tom Djajadiningrat, Philips Design, Eindhoven, The Netherlands
	MindSpheres
	Paper presentations
	Chair: Steven Kyffin
15.00 - 15.30	Stella Böß, Delft University of Technology, The Netherlands
	Meaning in product use: which terms do designers use in their work?
15.30 - 16.00	Rebecca Lawson / Ian Storer, Loughborough Universtiy, United Kingdom
	"Styling-In" Semantics
16.00 - 16.15	Coffee break
	Excursion
16.15	Departure
	Braun collection, Kronberg im Taunus
20.00	Dinner: Hafen 2, Offenbach

Program DeSForM 2008

Hochschule für Gestaltung Offenbach am Main

Friday, November 7th

Plenary lecture
Chair: Frank Zebner

09. 00 - 09.45 Klemens Rossnagel, Audi Group Design, Munich, Germany
Beyond the product

09.45 - 10.15 Coffee break

Paper presentations
Chair: Robert Young

10.15 - 10.45 Marina-Elena Wachs, Höpers Kamp 08, 21614 Buxtehude, Germany
Material codes and material narration

10.45 - 11.15 David Teubner, California State University, Long Beach, USA
Form generation through styling cue synthesis

11.15 - 11.45 Melanie Kurz, Creative Director, Strategy SIGNCE Design GmbH, Am Tucherpark 4, 80538 München, Germany - On the benefit of moving images for the evaluation of form in virtual space. Reflections in model theory

11.45 - 12.00 Coffee break

Paper presentations

12.00 - 12.30 Myriam Guedey, Hochschule für Gestaltung Offenbach am Main, Germany
Artful Systems – an aesthetic approach to interaction design in HCI

12.30 - 13.00 Shang-Feng Yang / Yung-Chin Tsao, University of Tatung, Taipei, Taiwan
Image cognition and preference study pertinent to interactive design of public art

13.00 - 14.15 Lunch break at the HfG Cafete

Paper presentations

14.15 - 14.45 Christine Kiefer, North Carolina State University, USA
The effect of worldview and culture on industrial design

14.45 - 15.15 Ching-Chih Liao / Yung-Chin Tsao, University of Tatung, Taipei, Taiwan
Research on the characteristics of regional culture and transformational design

15.15 - 15.45 Coffee break

Paper presentations

15.45 - 16.15 Kai Rosenstein, Z¸rcher Hochschule f¸r Gestaltung, Switzerland
Event, ceremony and trash. About the production and avoidance of semiotic pollution by design.

16.15 - 16.45 Thilo Schwer, Institut für Kunst- und Designwissenschaften, Universität Duisburg Essen, Germany
Black box consumption?

16.45 - 17.00 Coffee break

Plenary lecture

17.00 - 18.00 Klaus Krippendorff, The Annenberg School for Communication, University of Pennsylvania, Philadelphia - The diversity of meanings of cultural artifacts and human-centered design

18.00 Farewell, announcement of the next DeSForM Workshop

DeSForM 2008

Welcome to the DeSForM Workshop 2008. For the first time, the conference is held in Germany. The University of Arts and Design (Hochschule für Gestaltung) feels honored to host the fourth DeSForM workshop in Offenbach am Main. Offenbach, in the vicinity of Frankfurt, is a former industrial town, which, like so many old industrial towns, was affected by structural change over the decades and has developed into a large post-industrial city containing many office buildings. It has also developed into a multi-cultural city, with a high percentage of immigrants amongst its citizens.

The University of Arts and Design, Offenbach, was founded more than 175 years ago as a School for Arts and Crafts. Since then, its history has proven to be rich and varied, mirroring the role of art and design in our society. Since 1970, the HfG is recognized as a university. Next year we hope to start a Ph.D. program for artists and designers.

The workshop will be held in the main building of the HfG. While the venues of former DeSForM workshops were very spectacular buildings–such as the Evoluon Building in Eindhoven–ours is a building from 1911, which embues a special historical atmosphere. Part of the workshop is also a visit to the world famous Braun company in Kronberg, close to Frankfurt. We trust you will be excited by the chance to get an insight into the Consumer and Product Research Center of Braun as well as the chance to visit the so called "Braun Collection."

The University of Arts and Design is particularly honored to host this fourth DeSForM workshop, since the "Theory of Product Language" was developed here in the 1970s and 1980s. We are now challenged to develop this approach further and to adopt it to a fast-changing (design) world.

The fourth DeSForM workshop aims to continue the discussions of the former workshops. Themes of the discussions include interaction design, the importance of narratives or the role of material in design processes and especially the question of the semantics of objects.

We are glad to welcome young researchers as well as renowned keynote speakers such as Klaus Krippendorff, Klemens Rossnagel from Audi and Peter-Paul Verbeek. Thus, the workshop also continues to stimulate a discussion between academia, industry and professional designers.

We are honored to welcome you in Offenbach am Main and we trust that you will return to the 5th DeSForM workshop next year. Meanwhile, we offer the proceedings of this year's DeSForM workshop, initiated by the School of Design at the University of Northumbria at Newcastle upon Tyne, Philips Design, and the Department of Industrial Design at the Technical University Eindhoven, under the auspices of IFIP, Design Research Society, 'Interactions' in the HCI Group of the British Computer Society, with sponsorship and support from Philips Design.

Professor Loe Feijs. Technical University Eindhoven
Professor Dr. Martina Heßler. The University of Arts and Design (Hochschule für Gestaltung) (Conference Chair)
Professor Steven Kyffin. Philips Design
Professor Bob Young. University of Northumbria Newcastle Upon Tyne

The 4th DeSForM Conference
Offenbach am Main, 2008

Keynote speakers

Klaus Krippendorff

Klaus Krippendorff, Grad. Designer (HfG Ulm); Ph.D. (U. of Illinois); Gregory Bateson Professor for Cybernetics, Language, and Culture at the University of Pennsylvania's Annenberg School for Communication.

He is a Past President of the International Communication Association (ICA), elected Fellow of the American Association for the Advancement of Science and ICA, recipient of the Norbert Wiener Medal for contributions to cybernetics and member of the editorial boards of numerous academic journals.

He contributed over a hundred articles and book chapters on design, human communication theory, methodology in the social sciences and cybernetics, and authored *The Analysis of Communication Content* (Co-editor), *Content Analysis, An Introduction to its Methodology* (translated into four languages), *Communication and Control in Society* (Editor), *Information Theory, Design in the Age of Information* (Editor), *The semantic Turn, A New Foundation for Design, The Content analysis Reader* (edited with M. A. Bock), and *On Communication, Otherness, Meaning, and Information* (F. Bermejo, Editor).

He not only brings his scholarly interest in human communication to design – organizing conferences and workshops on product semantics – but, in return, also applies his experiences as designer to the field of communication and culture – exploring how social reality is constructed in conversational uses of language.

The diversity of meanings of everyday artifacts and human-centered design

Abstract

Meaning is a central concept for human-centered design. Designers of common artifacts cannot bypass the fact that different artifacts have different meanings to different people, usually related to their cultural backgrounds, expertise, particular interest, and the nature of the situation or context in which they face the artifacts of interest to designers. This empirical fact would make it a mistake to talk about forms as having meanings without reference to who perceives them as such. It would be a mistake for designers to believe they could design meanings into products. And it would also be a mistake to follow the old paradigm of designing something to meet technical specification – as is common to engineering.

This paper will state what human centered design entails and offer an appreciation of the diversity of meanings that people may attribute to artifacts. For lack of time, I can only provide a list of the typical meanings that designers do encounter but am prepared to discuss the implications of some. For lack of time, I am also unable to dwell in depth on the specific empirical methods of investigations associated with each kind but am happy to provide examples. The essay ends with several steps that are more typical for human-centered design than for object- or technological-centered design.

Keynote speakers

Peter-Paul Verbeek

Peter-Paul Verbeek (1970) is associate professor of philosophy at the University of Twente, and director of the master program Philosophy of Science, Technology and Society. His research investigates the relations between humans and technologies, with a special focus on issues of design. He published the book 'What Things Do: Philosophical Reflections on Technology, Agency, and Design' (2005), in which he develops a 'philosophy of things', in close relation to discussions in industrial design. He just finished a study on the moral significance of artifacts, and its implications for ethical theory and the ethics of design. At the moment, he is working on a research project about human enhancement technology and the blurring boundaries between humans and technologies.

Of signs and things.
Some reflections on meaning, mediation and morality

Abstract

In many discussions about design, products are primarily approached in terms of either functionality or aesthetics. They fulfill functions - ranging from practical functions to functions in the realm of product language - and they have specific aesthetic qualities which give them meaning, beauty, and style. These two approaches fail to take into account a third, essential dimension of products: their mediating role in human practices and experiences. Products help to shape human actions and perceptions, and organize specific relations between users and their environment.

The paper will first elaborate the phenomenon of technological mediation in more detail - including the (post)phenomenological background from which it can be analyzed. After this, the paper will investigate the relation of this phenomenological approach to the semantic approach. Products can be investigated both in terms of signs and of material objects. What are the differences between both approaches, and how can they augment each other?

In order to explore the differences between signification and mediation, the paper will, third, focus on the moral dimension of products. When ethics is about the question of how to act, and products help to shape human actions, products have a moral dimension. How to conceptualize this moral character of products? How does it relate to product language and semantics? And how can designers anticipate, assess, and design the morality of things?

Keynote speakers

Klemens Rossnagel

Klemens Rossnagel was born on 14 January 1960 in Neckarsulm. In 1980 Rossnagel began studying Industrial Design at Essen University. From October 1983 to September 1984 he attended the London Central School of Art & Design. He then returned to Essen from where he graduated in March 1986. From October 1986 to September 1987 Rossnagel studied Transportation Design at the Art Center College of Design in Pasadena, California (USA).

His professional career began in 1987 in the Design Department at AUDI AG. From October 1991 he worked in Japan as Design Manager for Volkswagen Technical Representative Tokyo. Following his return to Germany, Rossnagel was Design Strategist for Volkswagen AG in Wolfsburg from 1994 to 1998. In 1998 he moved to Asia once again, this time to Shanghai. As Design Manager he built up the Volkswagen Design Center there and was in charge of this until July 2000. From August 2000 to August 2003 he worked as Design Strategist at Volkswagen in Wolfsburg. From September 2003 to March 2006 Rossnagel has been Head of Concept Design Munich for the Audi brand group. Since April 2006 he formed Design Research for the Audi Group Design and is responsible for the University Coordination. degrees, particularly at the Royal College.

Beyond the product

Rapprochement of theory and practice

Prejudices against researchers are as manifold as they are against practicians. Instead of wasting their efforts in a battle both sides should try to approach each other. “Theory without practice is pointless, practice without theory is blind!”– a sentence by Siegfried Maser which is getting ever more important. The main problems of today’s design development, especially within the automotive industry turn out to be dynamism and complexity. Fierce competition and new problems render orientation the most urgent topic for automotive designers.

Design Research may contribute to the gain of knowledge. Only under the condition of providing specific instructions for action, Design Research is able to meet the requirements from industry and assume responsibility. To achieve this, a rapprochement of theory and practice is necessary.

Design Research needs to adapt to the economic requirements and organisational structures while industry should open up and demand results from Design Research. Even though automotive companies like Audi had Design Research implemented in their design process, independent research delivering objective results can be guaranteed only at scientific institutions.

Tasks

Industrialization created a gap between the producer and the customer. This applies not only to the gap in a local, temporal and cultural sense, but also to the division of labour and the specialization within the industrial process, turning out as another kind of gap, an alienation of the customer. If there ever was the customer, he has become an abstract. Therefore, we have to learn more about him or her. This is not a matter of market research, but a matter of empathy. Information and knowledge are the basis of any design work. In order to anticipate, how a customer will feel when perceiving our product, designers need to thoroughly understand the customer by putting him in the centre of the rational and emotional aspect of the design process. Contrary to market research or trend scouting, Design Research is developing a long term, general and strategic perspective. Above tactical and project related application of knowledge, the objective is to create leeway and options for the future.

Automotive design research

Design as a discipline within the automotive industry is part of the research and development department (R&D). Early on automotive designers understood the need to broaden their view beyond current projects. In the early 30s the first concept car was presented to the public. The aim was to test public reaction towards the design before the product was released. Instead of secret customer surveys and car clinics the public approach was promising. After that, concept cars or show cars were developed further, as was their purpose and effect.

On the organizational and process level the Advanced Design was implemented to overcome the dilemma of aesthetic reality turning faster than the development cycles in the automotive industry can handle. Not every existing trend is relevant for Automotive Design. In this regard Design Research can be valuable due to a different time-perspective and different objectives as compared to Product Development.

By reaching beyond current project, Design Research can deal with cultural topics, which gain in importance thanks to the globalization of the automotive industry. To deal with a lack of knowledge about their global markets, external design studios around the globe were opened, employing international designers from various cultures. The world was brought into the design studios.

In addition to that, Design Research is investigating specific design topics and cultural characteristics, feeding the results into the design process. Especially the Asian markets made it necessary for the industry to obtain this cultural knowledge. Regarding China's fascinating culture, one can imagine the challenges in design to come.

As design needs to be competitive and successful in all markets, we have to learn from those cultures. Much more than just a collection of facts, the resulting knowledge would include experiencing even the mundane and obvious "with new eyes". To observe this exciting process of cultural understanding and mutual influence and to contribute by creating successful Automotive Design, Design Research is not only valuable but also inevitable.

Contents

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The diversity of meanings of everyday artifacts and human-centered design

Abstract
Meaning is a central concept for human-centered design. Designers of common artifacts cannot bypass the fact that different artifacts have different meanings to different people, usually related to their cultural backgrounds, expertise, particular interest, and the nature of the situation or context in which they face the artifacts of interest to designers. This empirical fact would make it a mistake to talk about forms as *having* meanings without reference to who perceives them as such. It would be a mistake for designers to believe they could design meanings into products. It would also be a mistake to follow the old paradigm of designing something to serve a particular function – as is common and appropriate in engineering.

This paper will state what human centered design entails and offer an appreciation of the diversity of meanings that people may attribute to artifacts. For lack of time, I can only provide a list of the typical meanings that designers do encounter but am prepared to discuss the implications of some. For the same reasons, I am also unable to dwell in depth on the specific empirical methods of investigations associated with each kind but am happy to provide examples as needed. The essay ends with several steps that are more typical for human-centered design than for object- or technological-centered design.

Historical context of human-centered design

The paradigm of designing functional products for mass-production, an outgrowth of industrialization, died with Ulm, but stayed within engineering with its concern for production and functional use.

The attribution of a *function* to objects implies their subordination to the maintenance, well-being, or purpose of the whole of which they are a part. This part-whole relationship stems from theories in biology and technological systems where functions normatively specify what parts have to do to satisfy the requirements of the whole, for example, the function of the heart of mammals, or the function of the engine in a car.

Functional explanations invoke hierarchies. Not only does a car have a function, say in the life of its driver, its engine has a function relative to the function of the car, and a generator serves a function relative to that of the car's engine. Dysfunctions or malfunctions are the opposite of functions and describe parts that undermine the well-being of the whole or make that whole unable to function as intended. Thus, *functionalism*, employing functions as explanations of complex formations, entails a strong commitment to normative submission and fundamentally excludes human agency, the human ability to see things differently, question authority, and create new uses of artifacts, the ability to choose own goals, and pursue alternative ways of being with other people.

Products, by definition, are the end results of processes of production, of manufacture. Product design arose during the industrial era when manufacturers employed designers to attend to the aesthetics of what left their factory – the only thing for which manufacturers assumed responsibility. The functions that a product had to serve were specified by the manufacturer. It was not only designers who accepted that assignment; the users of products were expected to use them according to the producers' intentions. Where this was difficult, such as for typewriters, telephone switchboards, and washing machines – the most complex artifacts at that time – manufacturers arranged courses to assure correct use, and even created professions, such as typists, telephone operators, and factory-certified repair persons.

Designers extended the dominant part-whole determinism of functionalism to the relationship between the form of products and the functions they were meant to serve. This is evident in Louis Sullivan's (1896) aesthetic formula "form follows function." "Following" meant logically derivable from a correct understanding of the functions that an artifact had to satisfy. In a climate of technological determinism, this formula served designers well. If designers could argue that the form of their design was unique to the function the product was meant to serve, their proposals were more readily acceptable. Amazingly, the connection between form and function became the ground for an (industry-sponsored and industrial production supporting) functionalist aesthetics.

To appreciate the shift towards human-centered design, all one needs to do is compare the industrial era – a society that believed in technological progress and used its authoritarianisms, rationality and functionality to cope with scarce resources to bring this progress about – with the way we live today. I invite you to examine pictorial evidence of that time, the smoke stacks, widespread poverty, machine-like uses of human beings, including wars with how we live today

Our post-industrial era is no longer driven by techno-logical determinism but by mass markets, interactive media, and politics. It has replaced industry-based and government supported authoritarianisms by democratic structures. Manufacturers have lost their leadership to institutions invoking market forces, creating fashions, and the public, to interactive uses of communication technology, the internet, for example, with people taking for granted their ability to use available artifacts in their own terms. Post-industrial society is heterarchically organized, intensely political, certainly diverse, with rationality distributed over numerous communities and interest groups opposing each other on the agendas they represent.

In this new context, design can no longer be under-stood as industrial design or product design. It has to be something very different from the functionalism of which industry was once in charge.

Premises of human-centered design

Human-centeredness arose in the shift from designing functional products to designing artifacts that had qualities other than industrially assigned uses. While designers are still hired by manufacturers, in designing goods, information, interfaces, large multi-user networks, and projects, it became essential to attend to the users, spectators, and diverse interest groups, including the economically motivated manufacturers, politically motivated civil action groups, and professionally motivated designers as stakeholders. Stakeholders claim a stake in a design and knowledgeably use their resources in support of or opposition to a design. They form networks of interactions and interest groups designers have to recon with. THE user turned out a designer's fiction. Real users are diverse, intelligent, and may recognize many uses of a design.

It also shifted the ability to specify what an artifact is or should do from designers as agents of producers to its stakeholders. This brings me to my criticism of the idea of a product language. Its idea consists of assuming that products speak to their users in a language that designers need to master and user need to be able to read, by everyone alike. Human-centered designers would counter the idea of product language by insisting that it is humans who speak with each other, bring artifacts into their communication, determine for what they could be used, and establish their meanings. The idea of product language uses a metaphor that keeps design object-centered.

In contrast, I have been suggesting a human-centered approach in which all those coming in contact with an

artifact have the freedom of bringing their own meanings to it. A preliminary task of designers is to explore how, why, and when (in which context) artifacts invite which practices. The task that distinguishes designers from researchers is their ability to materially intervene in support of future practices that will be meaningful to their stakeholders which includes preventing practices that could harm them.

Let me list some of the principles that have evolved (Krippendorff, 2006), starting with the axiom of product semantics:

We do not respond to the physical qualities of things, but to what they mean to us.

This epistemological axiom distinguishes clearly between human-centered design, a concern for how we see, interpret, and live with artifacts; and object-centered design, which ignores human qualities in favor of objective criteria (e.g. functions, costs, efficiency, durability, ergonomics, even aesthetics when informed by theory). Object-centeredness favors design criteria that are generalizable and measurable without human involvement. Object-centeredness is particularly insensitive to individual and cultural variations.
This axiom also distinguishes design from engineering. In design, I suggest, meaning is central. In engineering it has no place. My preferred definition of the meaning of artifacts is:

The meaning of an artifact is its set of anticipated uses. To be known by designers, meanings need to be articulated.

Personal computing ushered in the idea of interfaces. Language-likeness, interactivity, submersion experiences, and self-instructability made interfaces no longer explainable in psychological, ergonomic, and semiotic terms and rendered the language of functionalism, consumer preferences, and aesthetic appeals obsolete. Interfaces are processes and they dissolved artifacts into interaction sequences. Since the 70s and 80s, interfaces have provided design with a totally new focus. The Semantic Turn offers dynamic accounts of how individuals cope with artifacts – not only computational artifacts but also ordinary everyday objects, designed or found in nature. It taught us that the make-up of artifacts is insignificant often unknowable compared to how one experiences interacting with them:

Artifacts arise in interfacing with them. Interfaces are recurrent sensory-motor coordinations that artifacts afford their user. Designing artifacts amounts to providing material affordances for the realization of meaningful interfaces.

So, artifacts cannot exist outside human involvement. They become artifacts by being made sense of, re-cognizing them, and using them by people with their own often unique histories of interacting with them. Incidentally, this is true also for objects found in nature. They become artifacts by acquiring meanings in use.

Undoubtedly, language is our most important form of coordination of human understanding. We create and coordinate our perceptual world in speaking with one another and we would not know the meanings that others bring to a scene without talking about them. My definition of meaning already includes language as a way to deal with it interpersonally. We construct technology in conversations. Design cannot succeed without communication among designers, creating narratives and stories and communicating with stakeholders or users. Hence:

Artifacts are languaged into being. The fate of artifacts is decided in language. Artifacts acquire social significance in narrative and dialogue.

Before the industrial era, there were millions of craftsmen, artists, poets, and thinkers who invented new technologies, created new visions, and experimented with new practices of living. The industrial era eradicated most of this creative activity by enforcing the distinction between creative designers and uncreative consumers who had to be told how to live and what to do in the service of mass production. The idea of THE user is a fiction conveniently maintained by designers who believe in their superiority over those for whom their design is intended. These terrible conceptions have lost their force. Increasingly, ordinary people demand making their own choices and designing their own environment with what they find. I am suggesting that designing is fundamental to being human and contemporary society increasingly realizes the fact that making things is fun and

the opportunity to play with possibilities, and to invent rules rather than follow those imposed by others, *enables people to realize themselves*. The possibility of designing or redesigning something, much like the possibility of telling or retelling one's story turns out to be the most important intrinsic motivation for people to engage in particular interfaces, including with each other.
I claim that:

Design is intrinsically motivating and constitutive of being human.

From which follows that
Design is not the exclusive privilege of a profession.

I am not suggestion that everyone is equally consequential in designing their world. But arranging one's furniture, creating a garden, cooking a new meal, sowing a dress for oneself are design activities through which people create their own meanings and define themselves and each other. The difference between professional designers and everyday designers is

- Professional designers ought to be ahead of everyday designers
- Professional designers need to consider the possible meanings that stakeholders could bring to their design and are responsible for what enacting these meanings could do to their users.

Methodologically, human-centered designers have three ways of considering meanings they cannot possibly control.
(1) *Understanding* not only the technology of a design but foremost how that technology is understood by its stakeholders, the users, bystanders, critics, and interested groups. Designers have good reasons to think unlike the other stakeholders in their designs. Fundamental to human-centered design is a new kind of understanding:

Understanding others' understanding or second-order understanding – without prejudices and preconceptions

This understanding is qualitative different from a first-order understanding of artifacts, of artifacts that cannot understand, talk back, or respond to meanings. First-order understanding is the understanding that engineers utilize when designing a mechanism. It is also the understanding that is sufficient for designing something for one's personal use. Second-order understanding amounts to familiarity with those for whom a design is intended. One method of obtaining second-order understanding is ethnographic inquiries into users' conceptions, habits, and motivation. Ethnographic methods require that the researcher suspends his or her own preconceptions in favor of the conceptions of the researched.

(2) *Cooperative design* can bypass some second-order understanding by involving stakeholders who participate in the design process. Users are not expected to have second-order understanding but their understanding can enter collaborative design decisions as alternative to designers' understanding.

Cooperative design means bringing stakeholders' understanding into design processes.

There are various methods available to invite stakeholders to participate in design decisions, ranging from focus groups, to usability labs, and to collective bargaining type workshops.

(3) *Delegating design* to users is a way for designers to avoid decisions that would require detailed knowledge of how their design might be understood and used, in effect providing users a space for designing their own artifacts from the possibilities made available to them by designers as well as from their environment. The reconfigurability of computer interfaces is one outstanding example of

Inscribing (re)designability into a design.

Designing (re)designability into artifacts radically alters the role that designers are able to play within a culture. Redesignability propagates design beyond the traditional confines of professional practices. It delegates design to non-professionals, saves the designer the trouble of working out the details that designers cannot control. This blurs the boundaries, not only between producers and users, but, more importantly, between the designers of spaces of possibilities (e.g., general purpose computers), designers who provide the tools for entering these spaces (e.g., of various software), and

all the way to everyday designers (e.g., computer users) who can tailor the artifact to their own use – which is hardly imaginable by the designers of possibility spaces. In effect:

The (re)designability of artifacts amplifies design. It brings forth a culture that increasingly understands itself as design-driven, no longer information-driven.

Designability by non-professionals changes the role of designers from artistic geniuses to someone admired for creating new exemplars, new paradigms, and possibilities for others to liberate themselves. It also changes the roles of those whom traditional designers thought to serve from consumers with needs that could be created, manipulated, and met, to stakeholders with own taste, intelligence, knowledge, influence and economic resources they may use for or against a design. *The Semantic Turn* describes this essentially political shift.

Abandoning the demeaning concept of THE user or consumer and acknowledging that there are many intelligent stakeholders whose cooperation is essential for bringing any design meant for others to fruition, suggests:

Design can succeed only when it inspires and sustains sufficiently large networks of stakeholders.

There are always users of course and consumers, but the people that professional designers need to convince of their design rarely are the users, but the representatives of corporations, who in turn may have to convince their financiers, the engineers who need to develop and specify the technology of a design, the distribution managers who need to ship the products safely and timely to their destinations, the sales people who need to see benefits for themselves and for their clients, the installers who have to see a way of fitting the artifacts into existing technologies and repairing or replacing them when needed, including the recyclers and ecological activists who want to be sure that valuable components are recycled and the remainder not ruin the environment. Each stakeholder must see possibilities to forwardly shaping a design according to their own abilities and intentions.

The diversity of meanings

The theory of product language has developed just three classes of meanings: aesthetic functions, sign functions (Anzeichenfunktionen), and symbolic functions. In addition to its lack of specificity, I like to recall that the notion of functions is incompatible with the premises of human-centered design. It directs attention to objects, away from what people do. As I suggested people speak, artifacts do not respond to language. The distinction into three kinds of functions are theoretically motivated, conceptually convenient for designers or critics, but far removed from the everyday life of those who may come in contact with the artifacts of design. Let me group the meanings that artifacts may acquire in the lives of those in contact with them in the following tentative categories:

- ***Personal*** – evident in individual experiences while interfacing with an artifact. This category omits the linguistic base through which these experiences become accessible. Understanding meanings as observer or outsider, including as the reader of this essay, can never be entirely divorced from the structure of language in which they are expressed.
- ***Linguistic*** – evident in artifact's users' coordination of understanding with others through the use of language and conversations.
- ***Social Practices*** – evident in how groups of people emerge in their use of artifacts.
- ***Ecological*** – from a larger anthropological/ technological perspective that designers may want to assume.

In my view, there is no way to provide a finite catalogue of meanings that artifacts could have. The general categories as well as the particular meaning in the following list are mere tentative suggestions, largely taken from The Semantic Turn.

Personal Meanings

Being handy

Attractiveness

- Newness
- In the right Place (or not)
- Simplicity
- Unity
- Regularity
- Symmetry
- Balance (or not)
- In grid/against grid
- Intentionality

Re-cognition

The entailments of visual metaphors

Categories and Distinctions

Exploration

- Extrinsic motivation

Informatives (Identification of affordances for possible actions ≈ Anzeichenfunktionen)

- Progress reports
- Confirmations
- Affordances
- Discontinuities
- Correlates
- Maps of possibilities
- Error messages
- Guides and instructions

Reliance

- Intrinsic motivation

Breakdowns, lack of affordances, error messages and instructions

Semantic layers

Transformability

- Reconfigurability
- Convertibility (e.g. into energy, financial resources)
- Consumability

Linguistic Meanings

Shifting statuses of artifacts (e.g., buying, owning, gifting, retiring)

Categories of artifacts – basic, super- and sub-ordinate

Characters of artifacts

Verbal metaphors of use

Narrating, drawing, sketching, videotaping artifacts

Scenarios – Narratives of interfaces – User instructions

Correlations between the structure of interfaces and the grammar of language

Distinctions among stakeholders regarding their linguistic competencies

Meanings that direct social practices

Defining individual stakeholders' identities by use of artifacts

Defining positions within social structures and social dynamics

Signaling group identities

Using artifacts to mark the progression in rituals

Designing

- Demonstrating second-order understanding
- Inviting stakeholders to cooperate in design processes
- Delegating of design
- Showing possibilities to potential stakeholders
- Turning control over to invited stakeholders
- Showing the transformability of one manifestation of artifacts to another
- Showing the directionality and progress of projects

Forming stakeholder networks. Critical sizes of supportive communities

Whole life-cycle accounting (sustainability)

Ecology of artifacts

Encouraging connectability of artifacts by stakeholder actions

- Physical (causal) connections (e.g., by cables, fasteners, or apparent fits)
- Family resemblances
- Metaphorical connections
- Institutional liaisons

Encouraging substitutability of artifacts according to their meanings for stakeholders

- Replacement of synonymous artifacts
- Improvements
- Retirements
- Simplifications of complex artifacts

Encouraging interactions among species of artifacts, initiated by stakeholders' practices

- Mutual cooperation
- Mutual competition
- Dominant-cooperative
- Parasitism
- Dominant-competitive
- Independence

Encouraging the emergence of technological complexes

- Technological cooperatives – cooperation

Technological imperialism – subordination
Technological obsolescence
Encouraging cultural mythologies as metaphors that guide ecologies of artifacts

The process of human-centered design

Any listing of meanings, such as pf the above, would make empirical sense only when they can be operationalized and enter the practice of designing artifacts with intended and permitted uses in mind and guide preparatory inquiries, design research for short. It would go far beyond the scope of this paper to outline a sufficiently specific design methodology for all occasions. In the following I will outline six typical steps of human-centered design and intersperse them with four constitutive difficulties that human-centered designers have to cope with.

The first of these difficulties is: (1) Unable to design meanings into products or force users to see what designers may see in their design, designers have to provide the material affordances for stakeholders to enact desirable meanings, usually a whole range of such meanings.

Besides updating existing artifacts or making minor improvements, truly innovative human-centered design tasks tend to follow these steps:

1. ***Envisioning possible worlds***, creating a design space that includes not only what designers can vary or compose but also what the future occupants of these worlds, other designers, and the stakeholders in these worlds might consider desirable.

2. ***Reducing or modifying these possible worlds according to what the stakeholders of a design can imagine and are willing to live with***. Important sources for narrowing the design space to one that would be attractive to future communities of stakeholders is creating or listening to compelling narratives, cultural mythologies of better lives, dreams of desirable futures in which the artifacts that designers may develop do occur.
The second constitutive difficulty that human-centered designers need to be aware of is that (2) the existing population of stakeholders may not be the population of futures users of a design – whether the time between designing and realizing a design exceeds existing generations of users and/or parallel developing technologies have changed the competencies and desires of current users. This leads to the need of

3. ***Finding ways to ascertain the vocabularies for meanings that future stakeholders can be expected to bring to a design.*** Above, I mentioned three ways. One is to explore existing stabilities, to inquire – using ethnographic methods, for example, or experiments with prototypes – into stakeholders' meanings that are likely to remain unchanged (second-order understanding). A second is to invite representative stakeholders who hold these meanings to collaborate in a design. A third is to design open artifacts that enable users to redesign or complete a design in their own terms, to delegate design. The first more so than the second way is prone to the second constitutive difficulty. The third way is exemplified by general purpose computers and cyberspace. Their open architectures accommodate an unimaginable number of meanings and uses.

4. ***Working out one or more paths to realize a design*** that might attract stakeholders who could collaborate in bringing the design and desirable future to fruition with present resources or resources that they might become available along that path.
This suggests a third constitutive difficulty of human centered design: (3) The path to any innovative design is not provable until it has been taken. In this respect design is always a proposal for action with the promise of leading to a better future for available communities of stakeholders. Unlike a scientific theory that can be validated by evidence, a proposal is "validated" by attracting capable stakeholders.

5. ***Enrolling stakeholders in the process of realizing a design***. Inasmuch as a design is always a proposal addressed to particular stakeholders, encouraging them to become involved, proposals may be analyzed as speech acts, satisfying five felicity conditions. A proposal should:
- Inform addressees what they could do with it or any manifestation of the proposed artifact (the set of possibilities intermediate states suggest) and what they can expect when acting as suggested. (Essential conditions)
- Be commensurate with the intellectual and material

resources that addressees have available or can garner in order to act as suggested. (Preparatory conditions)
- Be backed up by compelling arguments for the reality of the proposal – experiments, information derived from theories, and commitments asserted by stakeholders. (Sincerity conditions)
- Offer meaningful possibilities in which addressees see benefits for themselves and others. (Motivational conditions)
- Invite addressees to commit themselves to cooperate within a stakeholder network – with delayed rewards, under adverse conditions, disruptions or opposition. (Political conditions)

6. Finding backing for the semantic claims that designers make in their proposals. This typically involves conducting a variety of experiments and tests, and interpreting available data and established theories as supporting these claims, as well as commitments stakeholders may make to adopt a proposal. The concept of meaning is eminently testable and thus provides designers with arguments whose strengths may well approach that of harder and measurement oriented disciplines, such as marketing and ergonomics.

However, a fourth constitutive difficulty of human-centered design emerges, which is much like the third: (4) Present evidence can back semantic claims only where meanings are either stable or change predictably. Truly innovative designs prove themselves only after they are produced and survive in the market, use, and in the ecology of artifacts – all of which occur in a presently inaccessible future. Thus, semantic claims for future meanings always include an element of faith, for example, in the reputation of designers who are making such claims, in available evidence or scientific predictions, and/or in the commitments of stakeholders that are instrumental in realizing a proposed design. I suggest: ***Designs that ignore these six steps*** (in whichever form) ***are not likely to succeed.***

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Meaning in product use: which terms do designers use in their work?

Abstract
This paper is concerned with meaning in product use. A body of literature making recommendations to address this in design has emerged in the past twenty years. But are these recommendations used in practice? An interview study with designers was conducted. It asked how the designers try to aid that users are able to access the functionalities products offer, and how the designers check whether the users really can and want to access these functionalities. The following issues emerge from the study. Meaning in product use has many terms, but not necessarily the ones recommended in the literature. Semantics and affordances were little known and used, whereas communication, conventions, discovery and physicality were concepts that the designers used in the descriptions of their work. The paper concludes that a greater theoretical focus on dynamics, contextuality and physicality would be of help to the designers. Furthermore, techniques to aid the designers' preference for concreteness might be helpful. Such a focus and such techniques may enable them to consider meaning in product use more explicitly, as opposed to designed, intended meaning.

Keywords
Meaning, product use, design practice, semantics, affordances, interview study, terminology

1. Introduction

The research reported in this paper asked a number of practicing designers how they think about *meaning in product use*. By this is meant: it looked at how designers try to aid that users are able to access the functionalities products may offer, and how designers check whether the users really can and want to access these functionalities. The research is conducted in the form of an interview study with designers.

A body of literature on meaning in product use has been generated in the past twenty years in design theory. The literature offers recommendations to designers to try and make products usable and enjoyable to use. A brief review is given below. The literature has largely been prescriptive: recommending terms and concepts that designers should use in order to consider product use successfully. However, it has rarely been studied whether the concepts are actually used by designers in their work. The research reported here sought to do that. In its approach, it draws on the field of Computer Supported Collaborative Work and in particular, on the approach of ethnomethodology. There, it has been shown that for example in work situations, people behave differently than they are expected to do. They tend to manage their activities with reference to the ways things should be done and with reference to the demands of situations. There can be considerable gaps between these two frames

of reference. CSCW studies look at what happens in these gaps. This is also the approach taken here. Recently, Stolterman [15] has also argued that design research needs to engage with design practice.

This paper briefly reviews the literature that makes recommendations to designers in dealing with meaning in product use. It then presents the method and results of an interview study that enquired
- how the recommendations are present in the designers' talk, and what alternatives they themselves use, and
- how designers respond to the work situations in which they have to deal with meaning in product use.

The aim of this research is to help improve the understanding of meaning in product use in the design process. In this paper, only the first of these research questions will be discussed. The second research question will be discussed elsewhere.

2. Literature on meaning in product use

In roughly the past twenty years, theories were formed on meaning in product use. These theories have been discussed vigorously in the design research field. The purpose of the very brief review that follows, is to set the scene for the interview study with designers.

A new, user-centred approach to human-computer interaction in 1986 [13] identified a product on the one hand, and a person (or user) on the other, and identified the need to bridge a "gulf of evaluation" and a "gulf of execution" that existed between them. The concept of 'affordances' could be such a bridge, Norman [14] suggested. Affordances, according to Norman, are the "perceived and actual properties of a thing, primarily those fundamental properties that determine just how the thing could possibly be used" [14, p. 9]. But the application of the concept was not straightforward. How to identify these properties and what is the relation between the concept being used in design and being used in analysing product use? Under standings and misunderstandings of the concept are discussed for example by McGrenere and Ho [12]. Some designers did not adopt the concept, seeing it as overly complicated or constraining. Many product designers remained unaware of it because of a lack of communication between the human-computer interaction and product design communities. Djajadiningrat et al [6] also presented a critique of the notion of affordances. Inviting the user to a particular action was not enough in the design of electronic products with multi-faceted and often novel functionality, they argued.

Around the same time as Norman [13], Krippendorff and Butter [10] proposed a framework of "product semantics" and defined it as "a study of the symbolic qualities of man-made forms in the cognitive and social contexts of their use and the application of the knowledge gained to objects of industrial design" [10, p. 10]. They saw in this the potential of a truly human-centred design methodology. Initially derived from semiotics (the study of signs), product semantics looks at form as language-like. It is distinct from traditional semiotics in that it helps a product "point to itself" [10]. "The symbolic meanings of forms, shapes and texture are the most characteristic concern of product semantics" [10, p. 6]. Product semantics became popular in the 1980s in product design. It was adopted as a replacement for what was increasingly being regarded as a straitjacket of Modernist methodology, Brown found [3]. But it had mixed success in its application in product design, and interest in product semantics waned towards the end of the 1980s. Brown [3] concludes that the methods to arrive at products were not yet fully developed and that the full potential of semantics in design has not yet been realized.
The early semantic approaches tended to hint at intended possible human-product interactions via fixed product form. Krippendorff [8] went on to propose a more explicitly interaction oriented description of product semantics.

In the meantime, products and computational applications began to have more shared characteristics and problems. Black and Buur [1] identified a 'crisis of usability' in 1996 that affected both domains, and argued that solid user interfaces (SUIs) should be focused on to address usability issues. Kanis et al [7] and Boess and Kanis [2] presented an alternative concept to affordances: the notion of 'usecues'. It emphasises the users' attribution of meaning to products and the situatedness of human-product interaction. The concept is popular with the students we teach but has not been adopted widely in design practice.
In general, a tendency can be noted from static notions of product form and meaning, towards dynamic, inter-

action oriented notions. Of note in this is e.g. Lim, Stolterman, Jung and Donaldson's notion of interaction gestalt [11] as well as many of the contributions to the previous DesForm conferences. Djajadiningrat et al [5] pursue the potential of interaction by identifying a new research field they called 'aesthetics of interaction', in which the aesthetics of behaviorally active and reactive products is investigated. However, as mentioned above, it has rarely been studied whether the concepts described here are actually used by practicing designers in their work. Twenty years on from the first mainstream applications of product semantics in design, and ten years on from the identification of a crisis of usability, what concepts do designers currently use to think about meaning in product use, and what are the problems related to meaning in product use that they face in their work?

3. Research

A study was conducted comprising nine interviews with designers in the Netherlands that included independent designers, designers from small design firms and designers from a large, internationally operating design consultancy.

The analysis reported in this paper focuses on the question

- how the recommendations are present in the designers' talk, and what alternatives they themselves use.
  - Which terms do they use? Do their concepts correspond to the terms developed in the literature, or do they use other concepts?

3.1 Method

The interviews were conducted at the designers' place of work. The author carried out the study, assisted by students from Delft University of Technology. The researchers asked the designers to have some products with them at the interview that they had designed, so that these products could serve as tangible examples in the conversation. In the interview, terms like 'semiotics', 'semantics', 'affordances', or 'usecues' were not used a priori. Rather, the designers' own words were elicited first. The goal of the study was not to test the designers' knowledge, and it was thought important not to give the impression that this was so. Only if they mentioned a term from the literature or were clearly looking for it, the interviewers also used the term. Apart from that, the terms were only asked about well into the interview.

The interviews took about an hour. They were recorded on video and transcribed verbatim. The data were anonymised. The data were analysed with reference to the research questions posed.

The interview posed open-ended questions like "how do you think about meaning in product use", "how can you make sure as a designer that people know what they can do with a product", or "how can a product try to convey its possible use?" Part of our own stance (Boess and Kanis, [2]) is that knowledge on meaning in product use can only really be gained through testing, through experience or observation of actual product use. That is why in the interview, we also probed for the testing that the designers or others did with the designs in development.

3.2 Participants

The participating designers are briefly described. They are given short names that will be used to refer to their statements in the results section.

All of the designers who were interviewed work in the Netherlands. Six designers were from Philips Design, a large, internationally operating design agency. Three of these were product designers: one in medical equipment (TD), one in consumer electronics (FR), and one in consumer electronics and lighting (DS). One designer was a design manager in consumer electronics (JB). One was an interaction designer, also involved in designing consumer electronics (MR). And there was a product designer working both in user research and product design (MB).

Another product designer was from a manufacturer of large office machines (GS). And another was from a smaller design agency with a large range of products, from packaging to industrial machines (SR). Two were independent designers. One of those two worked in the area of lifestyle products (CK), and the other in the area of utility products for houses (DSm). All are educated in the general domain of design, two in Germany (FR, SR) and seven in the Netherlands. You are likely to have used at least one product designed by one of these designers. Products discussed in the interviews included television sets, remote controls, domestic appliances, office copying equipment, juice packaging, MRI scan equipment, window blind systems, and domestic lighting.

4. Results

4.1 The terms that designers use to talk about meaning in product use

Firstly, an insight emerges from the interviewing itself: is not entirely straightforward to discuss the topic of meaning in product use with designers. They seem to be more used to talking about meaning as designed, i.e. from their own perspective. It takes quite a bit of interviewing discipline in probing further on the topic.

'Recommended' terms

- Semantics is the most shared term, mentioned by four of the designers (FR, SR, JB, and GS). FR and SR state that this stems from their design education. Semantics is seen as assigning fixed meaning to object characteristics (FR), and as correct or not (GS). Semantics is also seen as a thing of the past, the 1980s (JB). The designers seem to distinguish between an 'old semantics' and semantics as they use it now, directly or indirectly. They see the 'old semantics' as describing static, physical product form: "It was in mechanical products, for example heat waves in a blow dryer. You don't have that with interactive products" (JB). And they see it as rigidly fixing meanings to product characteristics. "You can't test innovations with consumers. The IPod wouldn't be there. According to semantics, white means medical equipment." (FR) So the 'old semantics' is perceived as too static, too rigid. Nonetheless, many of the designers' views and statements are still perfectly in accordance with the idea of product semantics as the theory would see it. FR: "So we used soft touch paint and this engraved pattern which should say "I'm handle". Product semantics as formulated by Krippendorff and Butter [10] simply means, generally, to think of a product in such a way that it communicates something about itself. But in the designers' thinking, the static examples have become synonymous with the idea of semantics as a whole.
- It seems that at Philips Design, a former interest in semantics has now been replaced by corporate identity guidelines. The guidelines specify everything from colour choice and placing of the logo, to a design orientation to the context of product use and qualities of the user experience (MR, JB, FR). In a sense, the guidelines seem to safeguard the consideration of product semantics better than the designers' idea of semantics, without explicitly being called semantics. The guidelines recommend the study of experienced meanings in a context of use, which is also how it was formulated by e.g. Krippendorff and Butter [9]. On top of that, the guidelines strongly tie the consideration of meaning in product use to the brand experience.
- Semiotics is only mentioned by one designer, DS. He does not give any particular sources, but states that these are "general terms in the design field. A kind of visual language." "It's what the product tells you. It's that the user can easily recognize what they have to do with the product in order to activate or use a particular function." DS also thinks that this is a bit of a thing of the past, when products were not yet digital and interactive.
- Affordances: MR, an interaction designer, is the only one who knows this term, but is reserved about it. "The design process is a creative process after all, so one wouldn't be thinking of the Nielsen or Norman top ten or so ..."
- Usecues: MB knows this term, from her design education at Delft University of Technology, but states that her approach (and the general approach at the company) is more oriented on product systems as a whole. DSm also knows the term because he teaches at the same university, but says he was never quite sure what it's about.

The attitude of the designers to all of these terms is neutral to negative.

A diversity of other terms

A number of other terms are used and statements given by the designers with a rather more positive attitude, and more closely connected to their own work and descriptions of their products. The terms and statements are clustered here into four themes: communication, conventions, discovery and physicality.

Communication

All of the designers speak about products "communicating", "saying" something, "telling" something at some point during the interview.

- SR refers to products communicating "clearly". Often, the designers phrase this communication in terms of going "right" or "wrong" (SR, DSm). CK is different in that, he emphasizes the user's ownership

Figure 1: JB demonstrating how users would always expect a certain cluster of functions on a remote control.

of the product. He used to think in terms of right and wrong, he says - "but that's not the point, really it isn't. Some people just cannot be reached, and maybe you shouldn't try, shouldn't want it all."
- JB mentions the "readability of the functionality".
- Metaphor is mentioned by many of the designers as an important tool: "yes, I use that a lot. A user interface is all one big metaphor" (MR). TD connects metaphors to "a human approach", an emotion-based approach. He describes his products by means of metaphors like, for example, "a little friend", and mentions the human need to "look one another in the eye" in designing a screen-top webcam. The products themselves here become the mediating entities. This is different from FR's and MB's idea in which products are more part of a larger environment or system in which humans orient themselves.
- MD combines user research competence with design competence. In communicating about meaning in product use, she not only communicates user needs and activities verbally and through (image) stories, but also directly, by sketching during the communication with users and usage experts, verifying the sketches with them there and then, and then transporting this information back to designers in the form of sketches and scenarios. In a sense, she is the only one of those interviewed who is able to communicate about meaning in product use without any term at all. Her sketches can directly transport product characteristics from the usage context to the design context.

Conventions

Conventions play an important role for the designers (DS, MR, SR, JB). Partly, the designers rely on conventions to design for meaning in product use. They name three sources of conventions: the experience of users with previous products, general norms and guidelines, and corporate guidelines.
- JB states that with a well-developed product such as a remote control, one should not break conventions. "The users expect this cluster here with these five buttons. This has to always be there. It is based on a lot of experience and user research. We have a guideline layout for that which has to be used." (Fig. 1). With well-established products, a vocabulary is established that links to the actions that users carry out with it. For remote controls, for example, that is "head down" and "head up" - it is recognised that the user mainly wants to use a remote control blindly while watching TV, and this is reflected, for example, in highly tactile and formally distinguishable buttons (JB). For larger machines such as copying machines, the notion of workflow is used. "(For this machine,) we always use a workflow from left to right" (GS). So certain usage aspects are institutionalised at companies. For the smaller agency working with clients, conventions can be part of the design brief: "Some things are predetermined by the client - there has to be continuity from previous products, and we have to go along with that" (SR).
- Designers expect and hope for the knowledge of users (FR, DS, MR, JB). They see their knowledge and that of the users is the basis for a shared language. For example, symbols and arrangements of functions have this role. DS names several design details that he expects users to recognize, as does JB. Conventions need not always be transferred from other products, but can also be newly established in the encounter with a new product. DS states that through semiotics, something that is shown once will always be remembered "because it's so simple – that is the power of semiotics".
- DSm feels that norms and guidelines are important. For example for warning lights or warning signs, there should be very accessible norms and designers should take better notice of them. He would also appreciate guidelines for effective signaling of usage steps on a product (e.g. for self-assembly).

Discovery

Especially with regard to newer design projects, new modes of thinking emerge for the designers in which they try to formulate serendipitous, intuitive or physical ways that users can access functionalities.

- CK is the only designer to challenge conventions explicitly, and to play with them. CK: "I personally find it very annoying when products dictate to me what I should do, I want to be the judge of that." "One assumes the stupidity of consumers all too quickly." "I think it's o.k. for [users] to discover some things. I don't have to premeditate it all for them. Often there's freedom in not discovering something straight away, because if you do it's something that has been done before, then you're already in a sort of pattern." He is happy to let people guess for a bit. "There shouldn't be any text on the product. Maybe a bit of explanation on the box, but you can throw that away and then the product is yours again." In his view, a product passes from ownership by him, to ownership by its user - and then the user must be free to discover and establish their own use of the product. "I play with use, I play with form."

Physicality

- Reach/touch. CK is also the only designer to phrase meaning in terms of reach or touch. CK: "You do want to reach each other." "I try to reach the consumer, so to speak. So that there is a link and that we understand each other via the product." "Sometimes I want people to be touched by a thing - for example its vulnerability."
- An alternative view to conventions was developed at Philips Design when a new interaction paradigm was adopted in an extensive design research project, NextSimplicity (see [4]). FR and MR worked on it. The product form was based mainly on human and product gestures. For example, a product might change shape or position slightly to indicate an interaction possibility - or not even that: "When the product is passive, on the wall, it doesn't express its functionality. It doesn't say 'I'm a TV'. It's more of a surprise, it's about having a little fun element in it." (FR). A person could elicit a product action simply by holding their hand in a certain place. With products like these, it is not directly possible to fall back on conventions. The designers caution that users might need a little bit of time to learn to attribute these new kinds of meanings. "We tried to implement certain interaction possibilities" (FR). "We based the entire interaction flow on gestures" (MR, see also Figure 2). "[One might think of] some nice principles, but they can be for somewhat advanced users [...] It's all possible, it can all be done, but will the user understand it, especially a beginner or someone less

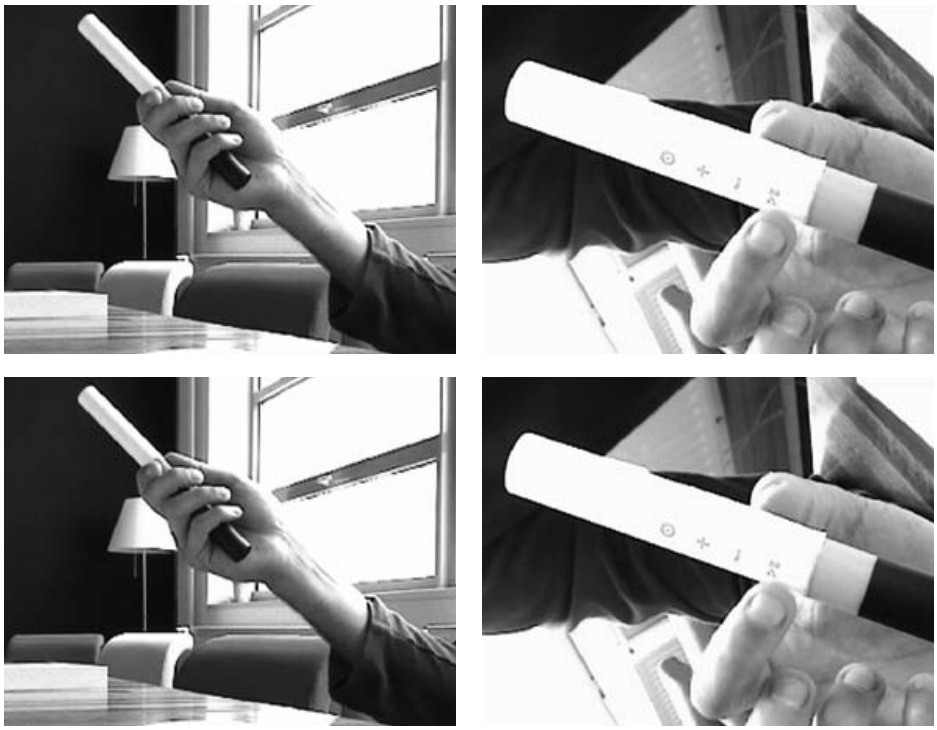

Figure 2: MR demonstrating the use of a novel remote control through gestures [4].

experienced?" (MR). Another aspect of the new paradigm is that products are being seen in terms of domains. For example, products in the domain of the living room have to have different interaction possibilities than products to be used on the kitchen table. This step away from function-based thinking and towards context-oriented thinking is currently being made at the large design agency (JB).

5. Conclusions and outlook

The study revealed that working with meaning in product use can be a source of some confusion for designers. They found it difficult to distinguish between their design intentions ("then the user has to do that…") and their ideas about what users might actually do of their own accord, and to talk about the latter. Some of them mentioned the recommended terms associated with product meaning, having learnt them, for example, during their design education. But they also stated that, for example, product semantics is a thing of the past. But what is there, instead? The designers talked about communication, conventions, discovery, physicality. In describing their concrete design work, the designers often state that they use their own intuition to design for product meaning. They hardly refer explicitly to any of the theory and methodology that is available, only naming a well-known theorist in one single case (and then rejecting use of this work).

Nameless meaning

Meaning in product use currently seems to be somewhat 'nameless' in the design process – partly, perhaps, through having too many names. How to improve on that without trying to tie designers down or overloading them with yet more terms? A way might be to connect meaning in product use closely to the enactment of product usage. While some designers make the distinction between "beautiful" and "functional", in their efforts and results the two often come together. The same product can have different roles at different times. And it has to give the appropriate message at the right time and moment. This dynamic character of meaning might be better represented in more dynamic terms and descriptions than the static categorizations that are mainly used in the design theory literature – and by the designers - at present. A surprising 'naming' of meaning in product use emerged in one case where the role of researcher and designer is united in one person. For this design researcher, it was partly possible to communicate about meaning directly via sketches of product characteristics and via scenarios, rather than through abstracted descriptions. This seems to suit the designers' preference for concreteness in considering meaning in product use.

The research has two clear limitations that arose from practical constraints: one, it only elicits the designers' descriptions of their work activity. Thus it presents their perspective rather than a more balanced view that might result from a participant observation study. Two, the study only elicits the designers' evaluation of how well users really can and want to access the functionalities their products offer. It does not cross-check the designers' statements with data from actual observed use of the designed products they talk about. We hope to conduct further studies that will overcome these limitations.

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Artful systems – an aesthetic approach to interaction design in HCI

Abstract
How difficult is the manipulation of a system? How often do mistakes in handling occur? How long does it take to learn a specific task? Efficiency based design thinking like that may be fitting in several situations, but according to human procedures, which in many cases cannot be grasped only by functionality, efficiency may not be appropriate. Furthermore the aspect of time plays an important role in the experience of computer-related technology. This poses the question of how to achieve more open and artful interactions between humans and digital systems.

1. Introduction

The rapid and extensive spreading of computer related technologies and their applications into many fields of human concerns has influenced especially everyday life vastly. On the one hand, those developments have transformed and standardized the way people encounter technology, on the other hand realised technology has an deep impact on the way people experience their world and act in it.
Questions of designing human computer interaction are therefore as well questions of everyday, of its cultural and social aspects. In the past few years this understanding lead to a change of view in human computer interaction. The necessity of an extension of traditional specific task-oriented approaches, for example the one of usability, which emphasizes basically on efficiency, is now commonly accepted in HCI. According to human procedures and habits in everyday life, which in many cases cannot be described functionally, concentrating on efficiency may not be appropriate. In this paper I therefore like to discuss several aspects that introduce an alternative approach, which concentrates on aesthetics in interaction design.

2. Artful systems and interaction

Aesthetics in human computer interaction can be viewed from different points. My focus is not the visual surface, but the quality of interaction itself, agreeing with an understanding of interaction as Youn-Kyung, Stolterman et. al. propose "that interaction is not something inherent only to the artifact but something that emerges through the interplays between people and artifacts" (1). Thus, interaction here is not seen as an internalized attribute of computerised systems or products, but as something that turns out its potential only through the mutual relationship between people and artifacts. The term "artful" is introduced to clarify that concepts in interaction design do not inevitably have to count on easy to understand and complexity avoiding strategies to activate the sense making, integrating and attachment provoking process on the part of humans.
On the contrary, completely and perfectly prearranged procedures in order to prevent mistakes in handling or interpretation of digital systems tend to reduce not

only cognitive load but space for improvisation and encouragement and, therefore, can easily turn out to constrain people in their behaviour in everyday life (2). Thus, Sengers, Blythe et. al. conclude that it lies in the designers' responsibility to consider the social and cultural conditions of computing technologies to make their appliances less restrictive. But what could support the aim of "less restrictive appliances"?

3. To catch a glimpse of artfulness

Christensen, Grinter et. al. (3) examined the strong attachment some people developed to their automated vacuum cleaner. Though this vacuum cleaner (Roomba) is in its function not as effective as a customary one without computing technology embedded, it has a remarkable impact on the household's social space. For instance, some of the interviewed families describe their time expensive efforts to organize the rooms in a way that Roomba would not get stuck. This in other cases perhaps as "not proper in function" declared attribute (Roomba gets stuck) does not lead to frustration, but to an activity experienced as enjoyable. The whole procedure of vacuum cleaning has changed from a tiresome to a more pleasant action that often involves more than one family member. This tolerance towards lacks in function and reliability comes from the rather strong attachment many Roomba owners feel and show by applying social norms and rules to the cleaner (giving names, a gender, a status). Christensen, Grinter et. al. refer the emergence of the special relationship substantially to the cleaner's attributes in its behaviour, for instance the indetermination of its moves that causes also the obviously missing efficiency while cleaning. Rather than to provide strictly functional support, Roomba (re)acts in a hardly comprehensible, artful way, encouraging a strong emotional attachment and therefore adoption of that technology in the home.

Several characteristics distinct an interactive artifact with computing technology embedded from an artifact without computing abilities, some of the basic ones are dynamics, flexibility, ability to active respond and intelligence (1). Interactivity and therefore the process of interaction is through its dynamics fundamentally connected to the aspect of time, as it is perceived as well as changing in time. Another important facet of time in interaction design is the conclusion that the way people experience and give an opinion of interactive artifacts changes over time, too. Christensen, Grinter et. al. point out the range of experiences people had have with their robots over a period of time, from scepticism (Roomba as a toy) in the first days to acceptance (Roomba as a useful tool) to attachment after several months of use (Roomba as an assistant or even as a "friend"). Hassenzahl, Karapanos and Martens also indicate that people's experiences and judgment criteria concerning a product's value (beauty, goodness) develop and alter over time (4), for instance the aspect of identification gets more important with time in contrary to the pragmatic issues.

To mention one research project that cares for the aspect of time not in a functional (time saving), but more social and aesthetic way (time producing, reflecting), I point out the idea of "Slow technology" by Lars Hallnäs and Johan Redström (5). Their investigations aimed at achieving long-term interactions between humans and digital systems. Therefore they focused on the slowness of the artifact's behaviour and on the complexity of the underlying interaction concept in order to give people time for understanding (How does it work? What is it for?), for rethinking standardized expectations of one dimensional interactions (e.g. push the button) and to create aesthetic experience that encourages an active examination of computerised artifact's. In this connection it is important, talking about aesthetic experience and active examination, to imagine digital technology not as "invisible" and not as seamlessly integrated into the environment and perfectly adapted to everyday procedures.

4. Conclusions and discussion

The above in short presented concepts and research results have in common the infiltration of usually expected attributes of digital technologies, for example precision and celerity, by including several typically non-technical associated characteristics. These concepts and investigations are not based on stable and easy-to-understand systems, but on more open and artful ones that therefore have the potential to encourage adoption and attachment and in consequence sustainability of computerised artifacts.

The notion of time is a crucial principle to interaction design in at least two ways: first, time is inherent to

interactivity as it takes place in time, and, second, people`s experience with interactive artifacts changes or develops over a period of time. Thus, aspects like mentioned above have to be further explored and systematically applied by interaction designers in order to establish a sound knowledge about artful systems and their potential as well as about the way they are perceived and experienced and therefore may facilitate adoption. Designers have to think of interaction as a thing itself that can be shaped beyond visual surfaces and inherent product features, though it cannot be anticipated and prearranged completely.

5. Prospects

As well as introducing an approach with emphasis on aesthetics to interaction design in HCI, I will exemplify it on various products and systems in order to provide some basic points for further systematic, practical based analysis and investigation of subjective phenomena (1). Thus, this paper offers at present some theoretical reflections, outlining a framework that needs to be filled and consolidated. My future research will concentrate on exploring various forms of artful interaction as well as its perception over time, both being evaluated in real environments.

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On the benefit of moving images for the evaluation of form in virtual space. Reflections in model theory.

1. Introduction

The primary task of design is to make a steady contribution to the expansion of the semantic space and hence to the perpetuation of our everyday culture by dint of the development of forms. The achievement of design reveals itself not in a single artifact alone. Designers also contribute to the development of sign contexts, thus influencing our future comprehension of sign systems. In the genesis of form, the sensuously experienceable element – the model – is an irreplaceable exigency. It is the focus of the iteration of thinking and doing; it communicates ideas and works for cognition of forms and their meaning. It is the model alone (as a heuristic design tool) that enables the designer to have the capability of examining, evaluating and changing the form language he has created – the serial specimen of a later period does not allow for corrections to be made anymore.

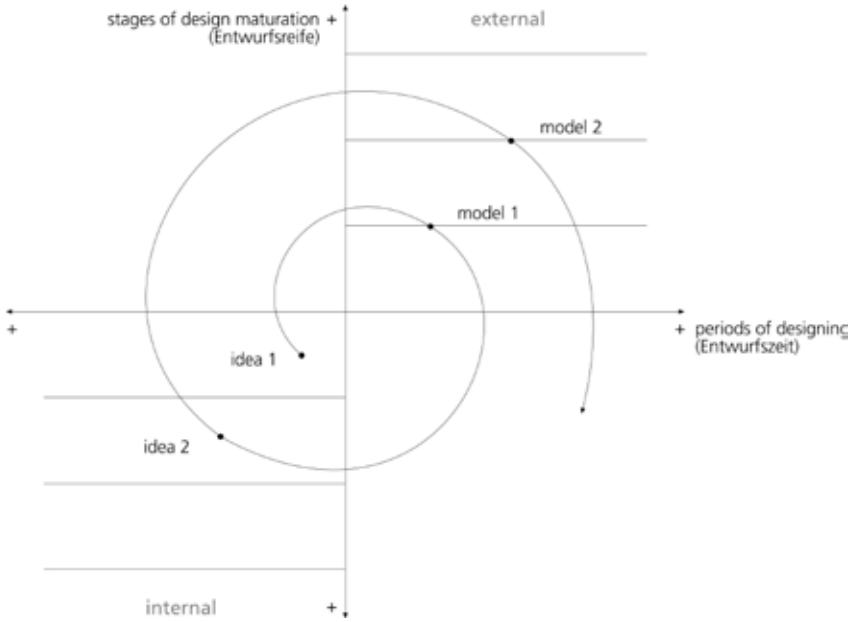

Fig. 1: Iterative model-based design process

The virtual model, particularly, has been increasingly finding its way into design development in conjunction with the digital saturation of product developmental processes. For economic and procedural reasons alike, physical, tangible representations are being replaced frequently by a growing multitude of methods of representation and appearance that are provided by the virtual world and offer an augmentation of experience. But the flood of representa-tional options in the context of the new media does not merely signify an opportunity for innovative processes in design. Concur-rently it forces the discipline to deal with the pro's and con's of the new technologies and the possibly misleading promises of the virtual and the illusory.

Thus options of its manner of representation have to be examined, so as to be capable of conceptualizing and deploying a model in a process-related way in accordance with its intended function. Against the backdrop of reflections in model theory and based on a psychology of perception as well as the results of neurological research (by reference to the title of the event: "Design & Semantics of Form & Movement"), the question shall be raised as to what benefit moving virtual models possess for cognition of form. Are moving images capable of promoting the cognizance of form in a virtual space? In which way does movement have to be represented?[1]

2. On the attainment of knowledge about the virtually repre-sented form by means of motion simulations

To be able to answer these questions, one has to differentiate between different types of representation in the field of the virtually moving image. Owing to this fact, the following reflections are divided into two parts: The first part is devoted to a movement that takes place in virtual space, whose function, though, consists of substituting itself for our own bodily movement. The second part brings into focus the filmic crafts that show the object itself in motion through virtual environments.

2.1 Movement whose purpose is to change the perspective

All cognition is connected to physicality and one's own experience, as phenomenology has taught us and our language already knows. (Prechtl 2002: 26f., Welsch 1996: 319) Concepts such as wahr-nehmen (apprehend), be-greifen (grasp) and ver-stehen (understand) indicate precisely how vital the object reference to one's own body is for the generation of knowledge. An exceptional discovery in this context was made by Jules Henry Poincaré. According to him, "the changes of what is perceived, produced through movement, are that which we perceive." (Foerster 1989: 36) They are the differences resulting from successively connect-ing single perception-sequences varying with our bodily movement. (Gombrich 1984: 247f) In this sense, Edmund Husserl explained that in the course of observing an object, we align our movement to complementing and completing the visual information. (Prechtl 2002: 89)[2]

One may infer the following from this: The difference in the percep-tion of the two worlds – the physical for one thing and the virtual for the other – is essentially entailed in the fact that, while we are viewing something on a monitor, we are not capable of establishing a relation between our own body, or to be more precise: our bodily movement, and the virtually depicted object. In other words: a change in the position of our body in space has no effect on a change of perspective of the object in the image. Hence we are denied impressions that are vital for unambiguously taking cogni-zance of and evaluating the qualities of a form.

Interactively moveable or computer-animated models are capable of providing a corrective – though only to a limited extent. Exam-ples of this are visualizations, such as interactive three-dimensional simulations in real time or the so-called virtual camera flight. In the first case, the viewer is capable of changing his per-spective on the object, at any time and arbitrarily, by interfering with the interactive system. In contrast, the camera flight consists of an image sequence that has been defined beforehand, which is not interactive and not individually controllable. In both cases the motion provides the change of perspective on the object, whereby the dynamism is shifted from the subject to the virtual space. The movement of the image simulates and substitutes thus our own bodily movement, so that we become part of the virtual space.

The moving of the image unfolds its advantages for the cognition of form when the perspective on the object is altered very slowly – and fast, hard cuts are avoided.

[1] The answer to these questions is focused particularly on dynamic objects with predominantly freely-shaped surface qualities – automobiles, for instance.

[2] In doing so, Husserl coined the term kinesthesis – a fusion of the terms of kinesis (movement) und aisthesis (perception). Kinesthesis designates the consciously targeted perceiving through move-ment. (Prechtl 2002: 89)

Fig. 2: Interactive three-dimensional simulation in real times

Fig. 3: Movement of the object by an environment

For the main purpose of viewing the moving image is to be capable precisely to track and monitor the surface gradients of the artifact by the lights reflecting on them. Hence movement means the option of a change of perspective taking place both slowly and steadily. It facilitates the opportunity to expand the experiencing of form in virtual space.

2.2 Movement of the object by virtual environments

The second type of representation is comprised of filmic crafts showing the virtual object itself in motion. Owing to the fact that virtual space, particularly, provides unlimited options for that, computer animations are in increasing demand and are being created concurrently with the advancement of digital technologies. They show the model of a car, for instance, racing along at terrific speed, driving along virtual mountain passes, on race courses or through street canyons. Such representations effect one quite emotionally and relate the virtual object to a digitally modeled environment. But is there any actual added value in dynamic representations of this sort? Or, to be more precise: Does the artifactual form have a different effect in a moving state than in a non-moving state?[3]

The findings of brain research and research into cognition point toward a definite No here. This comes as a surprise, especially with regard to the shape of moving objects. Human perception and the processing of stimuli, though, are what dictate perception and recognition of form, not any possible state of the product. The neurologist Vilayanur S. Ramachandran has discovered that our visual system forms the three-dimensional object from the optical information first and then in a second step, displaced chronologically, perceives movement based on the spatial object. (Ramachandran 1990: 151) This researcher formulated the rule of the rigidity of objects in 1986 in collaboration with his colleague Stuart M. Anstis. This rule states that we also always apprehend moving objects as an entirety and not as single parts, for instance. This fact contradicts the notion of a change – by means of movement – of the effect that forms make, forms that are rigid as such (the exterior of an automobile, for instance), because the perception of form has been concluded already prior to recognition of the object in the fourth dimension being added.

The brain scientist Margret S. Livingstone investigated the various sub-units of human vision. She has provided evidence in her research that form, color and movement are processed in three systems that are separated from one other. The area of the brain that is in charge of the precise recognition of non-moving objects is different from the area that perceives dynamics. The latter is "par-ticularly important for the perception of motion stimuli and is unsuitable for the detailed analysis of non-moving objects." (Living-stone 1990: 160) It remains in doubt, according to the findings of Ramachandran und Livingstone, whether the activation of the seeing of movement has any im-pact on the form that is perceived as long as the form is rigid as such.

Rudolf Arnheim falls into line with these findings from the vantage point of gestalt psychology. The sequence of individual images when visually perceiving a sculpture, a picture or even a dance performance is irrelevant, according to him, since "the order of a picture exists only in space, in simultaneity." (Arnheim 1978: 376) In contrast to a work of music, there is "a constant change but no progression [...]." (Arnheim 1978: 374) These statements and the fact of the stroboscopic nature of our perception of motion (Arnheim 1978: 387)

[3] Exempt from this question are animations visualizing kinematic concepts and systems, since the movement of the image here means a change of the shape of the object being represented.

Fig. 4: Irina Kolesnikova in Swan lake

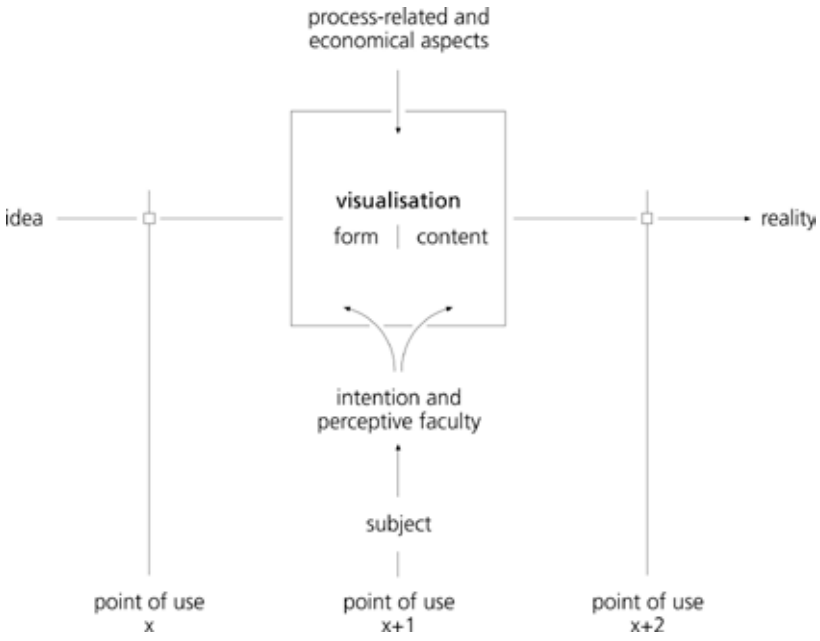

Fig. 5: Subject- and task-oriented model definition

provide ample justification for doubting whether any gains in cognition by means of virtual objects being in a state of motion can be vouchsafed.

3. Conclusion

While movement in the first type of representation mentioned aims at cognition of form and rationality, the benefit of the film crafts described later is entailed more in the emotionalization of the object being represented. Therefore the effect of movement in both cases is basically different.

For that reason it is necessary – prior to the creation of moving images – to determine to what purpose movement is serving. Against the backdrop of this situation in terms of perception psychology as well as being dependent on it, visualizations in design have to be minutely planned out so they will fulfill their purpose. A model-planning such as this can be termed a precondition for any gain in cognition during the process of form development. The reflections on model theory as well as on media theory provide the basis for this.

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The effect of worldview and culture on industrial design

Abstract
"The danger of any innovation was the chance of losing the wisdom that had gone into the development of the idea to that point."
Charles Eames

As industrial design evolves, the profession has the opportunity to redefine successful products in the context of culture and worldview. Just as worldviews and cultures vary, so should products reflect differences in behaviors and values. However, existing design paradigms maintain the concept that a product can be designed without understanding its context, by removing it from vernacular based solutions and without considering end users' cultures and worldviews.

Keywords
Worldview, Culture, Industrial Design, Inglehart-Welzel World Values Survey

Introduction

The underlying paradigms of industrial design are evolving fueled by the internet revolution, realization of the buying power of the "bottom of the pyramid," globalization and the saturation of mature markets. Prior to revising existing design paradigms or initiating new paradigms, the industrial design profession needs to analyze the effects of the current paradigm. This will allow industrial designers to reconsider the Western producer-product-profit logic and move toward culturally-driven design. Industrial designers will need to consider their personal worldviews and cultures, to understand the worldview and culture of the user and to appreciate that products can unintentionally communicate the designer's worldview and culture. By understanding a product's context, including the culture and worldview of the end user, an industrial designer can ensure that a product is appropriate.

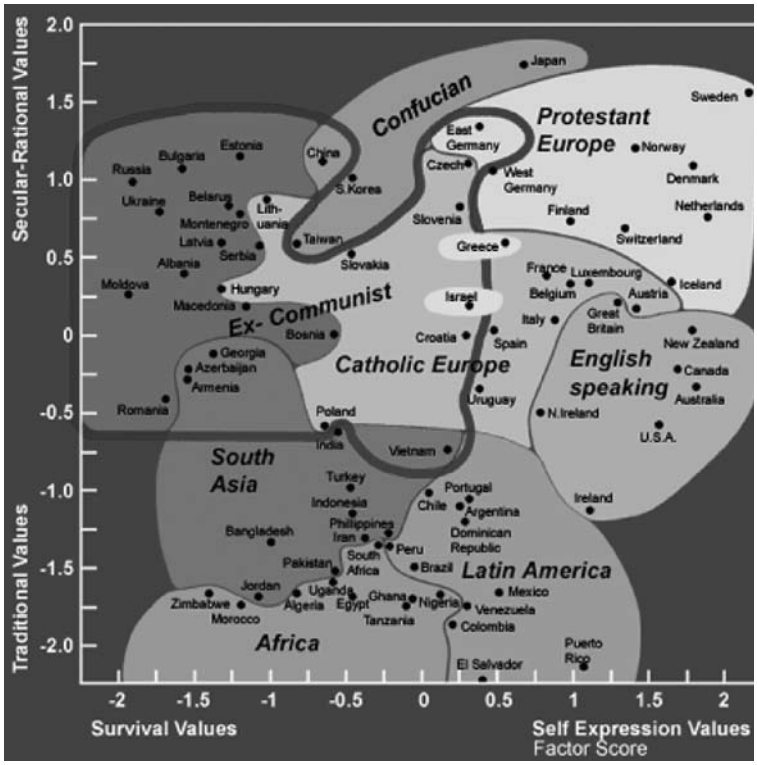
Worldview and culture

Worldview is the underlying assumptions and values that create a framework of realities and possibilities for an individual. Essentially, worldview is an outlook on life that colors decisions made everyday. Culture, therefore, is informed by worldview and is developed by a group of people or community within their worldview framework; culture is the resulting behaviors, values and objects. Culture and worldview are inseparable; there is no universal worldview and no universal culture.

World values survey

The World Values Survey found that worldview is largely dominated by two continuum scales: "(1) Traditional/Secular – rational and (2) Survival/Self-expression values. These two dimensions explain more than 70 percent of the cross-national variance in a factor analysis of ten indicators – and each of these dimensions is strongly correlated with scores of other

Figure 1: Inglehart-Welzel Cultural Map of the World <http://www.worldvaluessurvey.org.html>



important orientations."[1] (Figure 1) The traditional/ secular – rational continuum largely shows how a society gathers knowledge and the impact of religion and authority on daily life. The second axis is the relationship between survival values and self-expression values and is closely linked with industrialization and economic well being.

Design paradigms and their effect

The common understanding of industrial design is that it encompasses the intersection of business, technology and human values. In each of these areas, industrial designers are confronted by the traditional paradigm which includes three components: the business construct, educational pedagogy, and technological ideology.

Business construct

The business construct prioritizes the focus of industrial design on producer-product-profit logic. Business, by definition, is a rational and economic pursuit that is driven by process and judged by profit margin. Krippendorf states that producer-product-profit logic dominates design decision-making: "designing products means surrendering to manufacturers' criteria; for example, that they are producible at a price below what they can fetch on the market, as a rational extension of this profit motive."[2] This business logic assumes that all influences can be evaluated by profit, placing business interests above that of the user.

Educational pedagogy

Many design schools are based on Bauhaus philosophy; the theories of the school have created a singular model for design education and a singular view of design history. The Bauhaus school led designers to believe that Modernism was a universal language that could be applied to all products independent of their users and the users' worldviews. Gropius in the 1920's "declared on behalf of the Bauhaus: 'People, like machine parts, were interchangeable . . . all men have the same needs at the same hour each day of their lives."[3] Modernism sought a universal language of design that denied products their symbolism and history.

Schools adhering to the Bauhaus philosophy do not encourage alternate design philosophies. Subsequently, designers do not pursue different design languages, such as, traditional, vernacular and intuitive modes of design. The effect of narrow educational pedagogy is summarized by Krippendorf: "The explicit denial of pursuing a particular aesthetic, celebrating arguments in the name of science and technology has the effect of rendering cultures that held on to their own traditions or resisted the supposedly culture neutral functionalism of the industrialized West as 'backward' or 'undeveloped.'"[4]

Similarly, the history of industrial design as a component of educational pedagogy disregards those who did not share the Bauhaus design philosophy of rational process. For instance, "There is no history of design in India or in a hundred other places that lie outside the triad of Western Europe, North America and Japan. The effect is as though no significant design had ever taken place in the rest of the world."[5]

Technological ideology

Industrial design accepts the assumption that implementation of technology will improve lives and that new technology is superior to existing technology. This paradigm of seeking new technologies alienates those without that technology and devalues products that have indigenous solutions. "In the belief that technological development would improve the quality of life for everyone, and committed to contribute aesthetically to material culture, designers worked without reflecting on their role in the larger context of expanding Western industrial ideals and replacing different cultural traditions elsewhere."[6]

[1] World Values Survey - Findings Citation. World Values Survey, 1 September 2007, <http://www.worldvaluessurvey.org.html>

[2] Klaus Krippendorff, The Semantic Turn: A New Foundation for Design (New York: Taylor & Francis CRC, 2006) 8.

[3] Eva Zeisel, Eva Zeisel on Design: The Magic Language of Things (New York: The Overlook Press, 2004) 132.

[4] Krippendorf 310.

[5] Matthew Turner, "Early Modern Design in Hong Kong," 8 April 2008, 200.

[6] Krippendorf 8.

The paradigm, as a component of the designer's cultural values, creates a design framework that communicates assumptions regarding the designer's worldview and values to the end user through the product. Products are not neutral; they cannot be separated from the assumptions of the industrial designer, either intended or not. These assumptions include:

1. Products are made for the use of some (not others)
2. Products are not distributed evenly (haves and have-nots)
3. Products make assumptions on how they are used and who will use them.[7]

Existing design paradigms create frameworks of thought that hinder the designer from either thinking in a larger world context or creating solutions that address issues not common to his/her own culture. Essentially the business construct, educational pedagogy and technological ideology create a design framework that is ethnocentric and culturally deterministic. This underlying basis of design creates an assumption that a product can be designed for a specific worldview and then naturally accommodates a group of people with differing worldviews.

Worldview and industrial design

Industrial designers are simultaneously constrained by their personal worldview and culture and generally uninformed of the diversity of worldviews and cultures. On the traditional/secular-rational values continuum and survival/self-expression values continuum, a designer will often find themselves unaligned with the end user. The majority of industrial designers are from worldviews and cultures that take survival for granted; therefore, they deemphasize economic and physical security. But, much of the world's population still struggle daily for survival. Similarly, an industrial designer's worldview may not emphasize self-expression and post-materialist values in the same way as the user's worldview. Nevertheless, an increasing number of people are moving toward self-expression values as societies move toward postmaterialism.

How can an industrial designer reconcile dissimilar worldviews and cultures and produce objects that are appropriate to the user? And what parallels can be drawn between worldview and primary design influences?

[7] Malcolm Barnard, Art, Design and Visual Culture (New York: St. Martin's Press, 1998) 149.

An industrial designer cannot deny that products are part of a person's everyday life, ritual, and behavior, thus becoming an integral and defining item of culture. Therefore, a designer should not ignore cultural and worldview implications during design. Industrial designers are challenged to consider human values as well as business and technology and to synthesize these components into an aesthetic form that meets users' needs culturally and functionally.

For designers to achieve culturally-determined design, products not only meet the triad goals of ease of use, improving the lives of people, and manufacturability but also function within cultural parameters. Products become part of the visual language, similar to verbal language, which a culture uses to express and define itself. Symbology of a product is as important to the success of products as function.

Appropriate products

Appropriate objects are the outcome when prior to the actual design of the product the designer considers relevant technical and business issues as well as asking questions regarding personal assumptions related to culture. These questions include:

What is the designer's worldview and culture?
What is the worldview and culture of those who are going to use the product?

The purpose of these questions is to elucidate differences in the contexts of the designer and the user. Operating strictly within the designer's personal worldview limits solutions to those that would be appropriate in the designer's context but could be unfit for a user in a different context. Once a designer is aware that he/she operates within a specific worldview and culture, it is possible for him/her to analyze his/her own culture and the influence it has on his/her design.

Consider the design outcome of two products that have the same function but are designed for differing worldviews and cultures. If the function of the products is the same, then the difference in form is a result of the end users' worldview and culture manifested through symbol, behavior and use. Therefore, the primary design considerations such as ease of distribution, economic development and locally available resources as well as

Figure 2: Food dehydrator designed for Sweden that responds to Swedish worldview, culture and context. Primary design influences: functional, rational Swedish design, historical use of textiles as decoration in house wares, the current design trend of combining modern forms and technologies with traditional Swedish crafts.

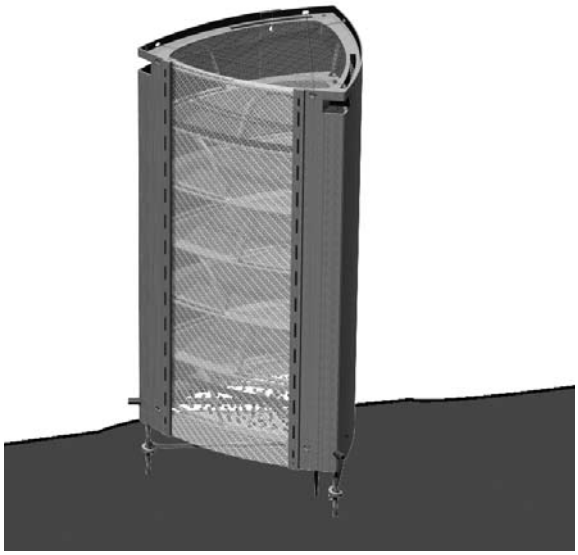


Figure 3: Food dehydrator designed for Haiti that responds to Haitian worldview, culture and context. Primary design influences: distribution by donkey and foot path, locally available materials, skill set of local labor, and economic development.

form, style and emotional connection are dependant upon the users' worldview and culture.

For example, a food dehydrator was designed for users in Haiti and Sweden. The function is the same for both countries but the design outcome is different in response to the users' worldview and culture. (Figures 2 & 3).

Primary design considerations

Analysis of the users' worldview and culture alters the design process to emphasize consideration of the end user's context. Therefore, the industrial designer must first understand the worldview and cultural context in which the product will be used. This changes the emphasis to the interaction between the object and the user in his/her own worldview and culture.

Analysis of the same product designed for differing worldviews illustrates each country's worldview and cultural values which directly affect the design of the product. All aspects of design and production are influenced. However, the primary design influence for each country is related to the underlying cultural values of the survival/self-expression continuum on the Inglehart-Welzel Cultural Map of the World. As the Inglehart-Welzel Cultural Map of the world suggests, survival values influence the design of products to consider issues of economic development, local handicraft, available infrastructure and local production. Within this framework, the predominant influences are locally available materials and contextual issues, such as, local distribution systems and living conditions. Products are based on minimizing cost without decreasing function while respecting cultural values. Style and emotional connection are secondary. Nevertheless, that is not to imply that products do not have any symbolism.

In contrast, those countries on the Inglehart-Welzel Cultural Map of the World that value self-expression encourage the design of products to consider issues of nostalgia, customization and image. Within this framework, the predominant influences are creating an emotional bond between the user and the product, considering life cycle issues, and increasing the atomization of the product. The goal of creating an emotional connection cannot come at the expense of function, however, as the user assumes that the product will be easy to use and function seamlessly. Unlike the countries that are heavily influenced by survival in their worldview, countries that value self-expression have a history of mass produced products and a design language that draws upon current and historical product design context.

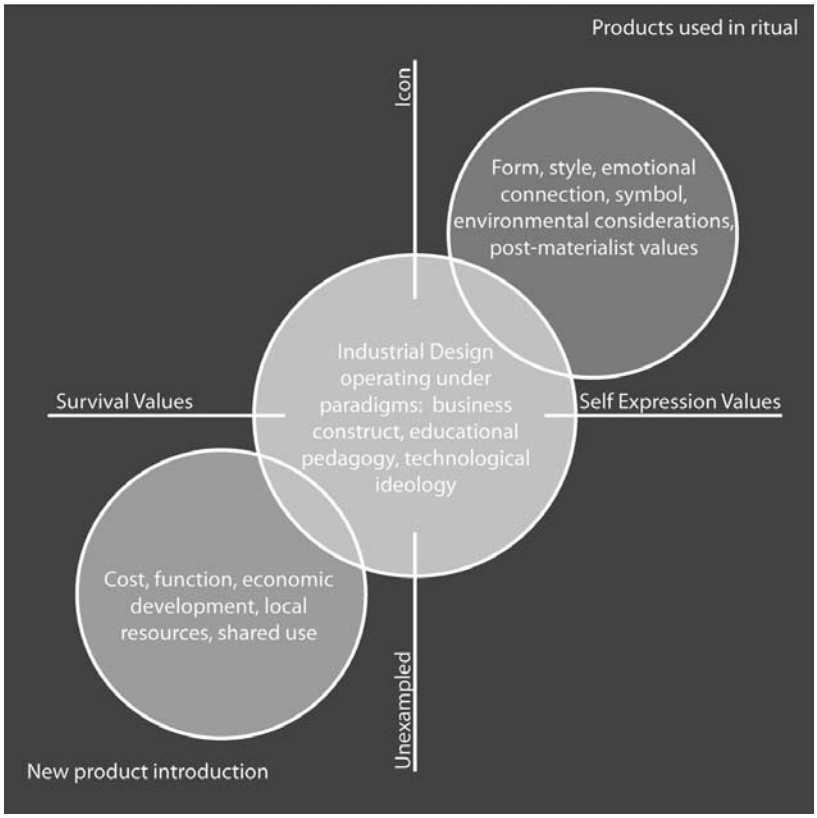


Figure 4: The effect of worldview and culture on industrial design based on the survival/ self-expression values from the Inglehart-Welzel Cultural Map of the World and symbology of products - unexampled/icon.

Conclusion

The effect of worldview on product design can be diagramed on two axes: (1) survival values/ self-expression per Inglehart-Welzel worldview survey and (2) unexampled (new products and concepts) culturally integrated products (icons). (Figure 4) The location of the product concept can help the designer to determine what important assumptions are regarding design factors based on worldview and culture. The result is high-level understanding of how a product relates to worldview and culture. Each worldview and culture will have different product placements as the values and behaviors are different for each group of people and the integration and meaning of a product into the culture changes with each.

The graphic can also show zones where certain paradigms are active. If a product falls in the lower left-hand corner, cost and function will be valued above, but not excluding, symbolism and form. This is the area of the graph that addresses the needs of 90% of the world. If, on the other hand, a product falls into the upper right hand quadrant, then symbolism, style and form are primary. This is the area where the product needs to enhance the users' experience of an activity and tell a story. Additionally, the product may strongly reflect post-materialist values. Industrial design continues to operate within the traditional paradigm which emphasizes technical and profit influences without regard for the influence of worldview and culture. Industrial design will evolve as there is increased understanding of the users' worldviews and cultures.

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Rebecca Lawson and Ian Storer

‘Styling-in’ semantics

Abstract

Rapid technical advances in industry have resulted in designers having to draw upon a semantic dimension in their product designs. To maintain a competitive edge, designers need to generate appropriate product form that differentiates themselves from other products in the marketplace.

In this paper, the authors focus on the current working practices that product designers undertake in order to generate a design solution that meets the consumer’s semantic desires through its visual qualities. The research explores the extent to which a methodology to aid designers synthesise and evaluate semantic visual concepts is desirable or credible.

The paper documents interviews carried out with seven practicing designers from six design consultancies. An understanding is gained as to whether product designers consider semantic values during the process of designing and if so how these values are ‘styled-in’ to product form.

The paper reports the findings of these interviews and discusses the working practices of individual product designers.

Introduction

Designers are often depicted by researchers as working within the framework of a ‘visual language’ [1, 2], communicating form through a ‘visual dialogue’ of lines, shape, form, colour and texture [3, 4]. In describing the role of a designer (figure 1), Crilly (2005) uses an analogy of a writer, depicting a designed product as text ‘written’ by the designer and ‘read’ by the consumer [5].

During the process of ‘designing’, it is commonly considered that a design message is generated [6]. ‘Marketers charge designers with the task of developing product with appealing form’ [7], determining what a product form should visually convey and how product form will communicate product values [5]. Designers must not only find a suitable means of understanding and recording consumers’ latent desires but also ‘encode’ those desires into a product form [7, 8, 9].

‘Design intent’ is the term used to describe designer’s motivations and intentions to evoke a specific consumer response [5]. This is often when designers make valued, qualitative decisions about a product’s design direction, heavily dependent on their individual intuition or at best their level of ‘aesthetic intelligence’ [2]. A review of literature suggests that designers use visual references to assist their pursuit of appropriate form [5, 10].

Visual referencing is widely acknowledged as being vital during the process of designing [5]. However, when addressing visual references and design intent, some designers are reliant on ‘personal experience and anecdotal evidence’, with little of no support from quantitative tools [5].

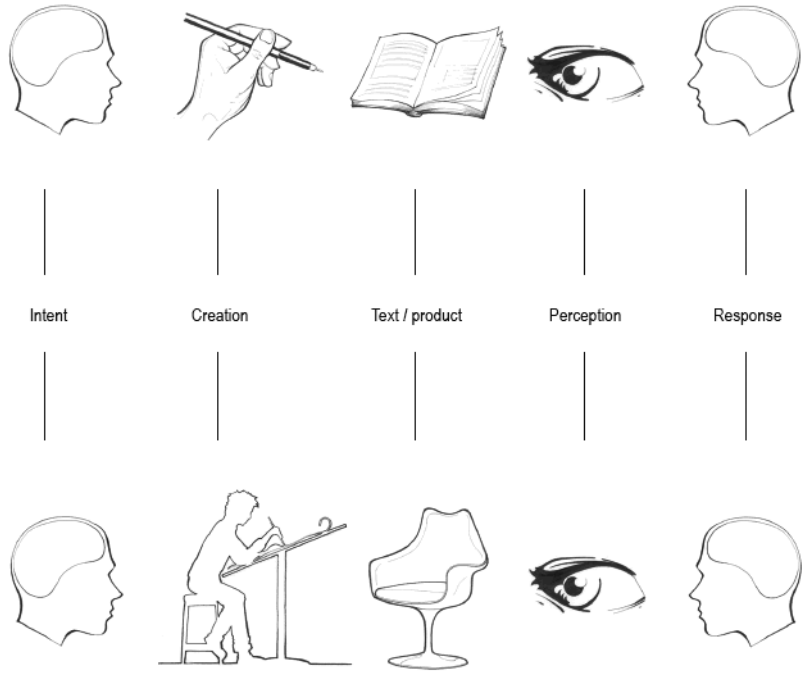

Figure 1 Diagram to illustrate design as a visual language (Crilly, 2005)

Some methodologies exist to educate and guide novice designers in their pursuit of appropriate product form. These methods are predominantly Warell's (2001) 'form syntactic' approach [11] and Karajalainen's (2004) 'semantic transformation' method [12]. However, these methods facilitating a designer's understanding of product form are primarily used in an educational context.

The authors pose the question: can product stakeholders afford to base their design decisions on design intuition? Could an evidence-driven methodology provide the designer with a design direction and offer some measure of quality control against consumer desires?

This research is part of an ongoing research agenda investigating the current working practices of seven product designers from six design consultancies. In the paper, the authors explore whether designers consider semantic values when designing and if so, how designers record 'design intent' or in its broadest sense 'design direction'. The research looks to gain insight into the processes designers go through in order to ensure the correct product messages are conveyed through the product form.

Objectives

The objectives of the study were as follows:

- To gain insight in to the different ways in which designer's record 'design intent' or 'design direction'?
- To compare and identify the processes designers go through in order to style semantic 'values' or 'key words' into a product?

Method

The study required a focused sample of creative design practitioners from product design consultancies and in-house design departments. This paper documents the results to date, providing an initial overview of the designers' working processes.

An interview was chosen as a flexible and adaptable way of obtaining qualitative data relating to the general working processes undertaken [13]. Semi-structured interviews comprising of nine questions, were carried out on an individual basis (figure 2). In order to achieve the objectives stated above, an interview was carried out with each participant. Interviews were carried out in the participant's work place and the questions enabled participants to respond making reference existing design work, allowing them to illustrate their answers.

This approach enabled the researcher to observe and listen in greater detail to the participant's responses. As the working processes of the participants were unknown, a semi-structured interview facilitated the designer in talking openly about a design project, from which the researcher could draw upon important findings and establish hypotheses on which to base further research.

Question 1:	**Tell me about a design project you have been involved with?**
Question 2:	**How do you like to start a project?**
Question 3:	**Do you research? If so, how and what things do you research for?**
Question 4:	**When working, i find inspiration from…**
Question 5:	**At any stage during your work do you generate keywords? If so where do these come from?**
Question 6:	**To help me generate ideas i like to…**
Question 7:	**When designing a product, how do you decide which concepts are developed further?**
Question 8:	**I know a product is fit for purpose when….**
Question 9:	**How do you know the consumer will interpret the product's visual design the way you intended?**

Figure 2 Table containing semi-structured interview questions

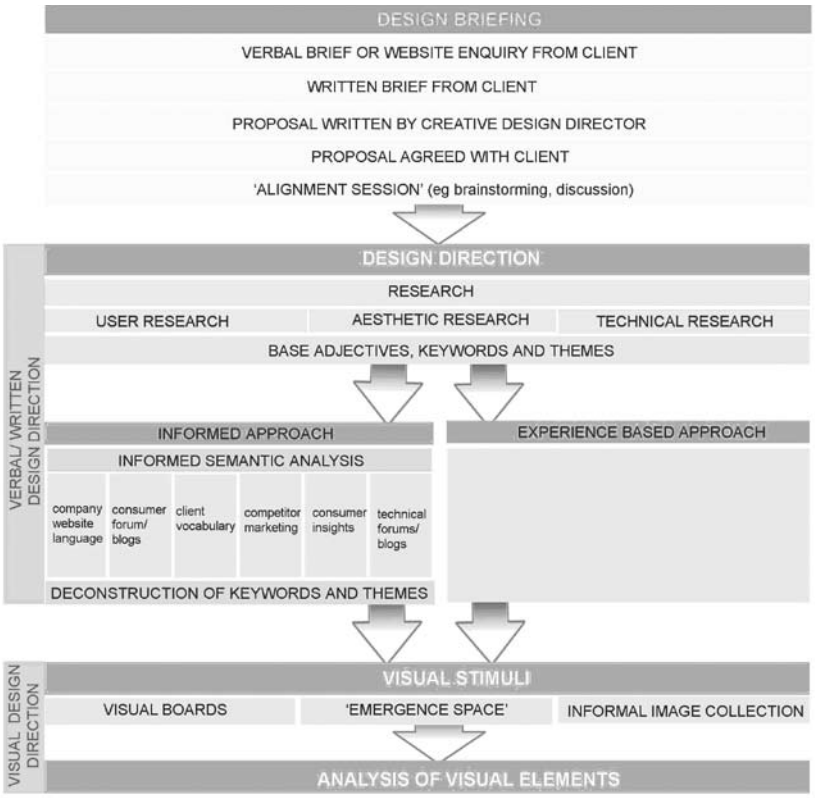

Figure 3 Diagram to illustrate generic elements considering semantics during the process of designing

Results and discussion

1.0 A framework of designer's working processes

In analysing the results, a framework documenting the ways in which participants recorded a design direction emerged. Figure 3 shows the typical processes designers went through in order to style-in semantic values or keywords are recorded within the framework, supported by qualitative examples.

2.0 Brief and alignment session

The research identified that typically all of the designers in the study started to consider semantics during the briefing or 'an alignment session'. This team briefing session would allow the team to fully understand the 'criteria and requirements' of the brief and identify the product's brand values and consumer's vision. Participant 01 described these briefings as 'alignment sessions' whether it be aligning the creative director and the client in the first instance or aligning the designers and engineers as to what the project objectives are. Supporting this, the designers interviewed, suggested that the primary aim of the initial group meeting was to establish; (a) what values the product needed to convey to the consumer or user (b) where the product needed to sit amongst its competitors in the marketplace or rather what 'design direction' would be taken in order for the client to achieve their objectives. Participants went on to translate the key criteria into a design direction (figure 4).

3.0 Design Direction

All of the designers sampled, established that it was vital to be clear on the direction that the product was going to take. Design direction was initiated in the early stages of the project by user, aesthetic, or technology focused research. Regardless of the project's research focus, each of the different products considered aesthetics on some level and interestingly, all the projects identified brand objectives at the forefront of the design direction.

3.1 Base Adjectives, Keywords and Themes

Participants consciously or not, tended to document their research in the form of 'base adjectives' and 'key words' (figure 5). In some instances, this took the form of themes rather than key words but inevitably encompassed terms that would trigger a design direction. For example, an Alessi theme would equate to 'fun', 'organic' forms, 'fun' and 'organic' would be considered key to the design direction.
The results showed that despite there being different working practices by which the designers initiated a design direction, (for the purpose of this research) these could be categorised into two fundamental approaches; the 'informed approach' and the 'experience based approach' (figure 6).

3.2 The 'informed approach' and 'experience based approach'

The 'informed approach' explored the market place in

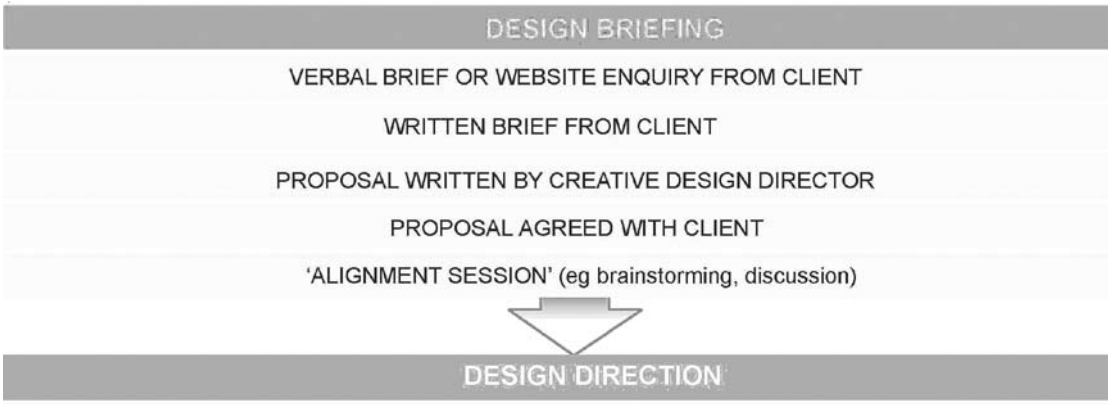

Figure 4 Diagram to show the stages identified as part of the design brief

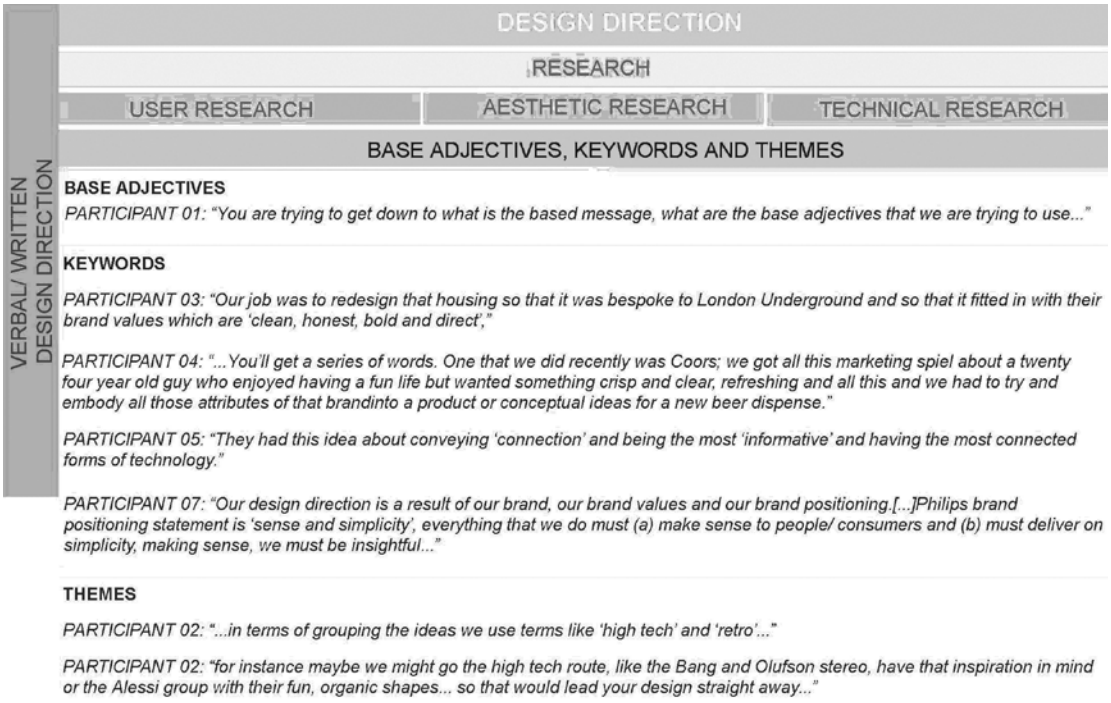

Figure 5 Qualitative evidence to support the use of to 'base adjective', keywords and themes

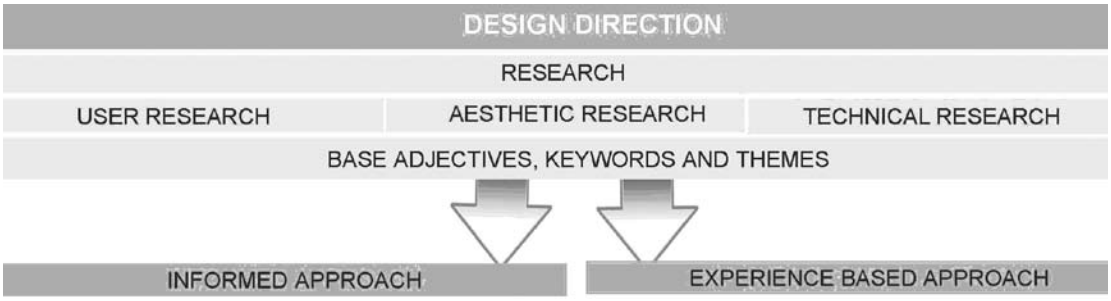

Figure 6 Diagram to show the 'informed' approach and 'evidence' based approach

greater depth; gaining a more detailed understanding of the product, product field and product competitors. These insights facilitated a significantly more market-led approach; directly informing the design direction. Whilst, the 'experience based approach', required designers to form design direction(s) for a product based on their design experience and knowledge of past and existing products. Designers using this approach were reliant on design instinct to understand and balance the product aspirations of both the client and market. Participants that showed evidence of adopting a strong 'informed approach' developed these adjectives through conducting semantic analysis of their research findings Whilst those using the 'experience approach' were often reliant on subjective interpretations of the research findings.

3.3 Informed semantic analysis.
Participants of an 'informed approach' were often increasingly aware of the apparent strategic advantage of formulating a design direction through the language used by the consumer, clients, and competitors. Some participants attempted to map the emerging language from the analysis of these groups as a means of comprehensively understanding any trends that were emerging (figure 7).

In some instances participants were able to derive this design direction from pre-defined brand values and these catalysed the design direction. These designers did not need to establish new design directions because an existing brand language (in the form of the product range) was acting as a foundation. Interestingly, even in these cases, when given pre-defined key words, designers stated they 'respectively ignored them' so as not to cloud their own semantic analysis of the research.

For example, participant 07 despite having these core brand values, for each 'program of work' formed new keywords that were specific to project objectives. For example, in the design of consumer electronics, alongside the brand vales would be product related key words like 'interaction' or 'immersion'.

3.4 Deconstruction of keywords and themes
The sample disclosed that the next fundamental step towards establishing a design direction was to have a clearer understanding of the 'base adjectives' identified through informed semantic analysis. In order to fully understand those keywords, designers 'deconstructed' them to their most basic form (figure 8).

4.0 Visual stimuli: the manifestation of base adjectives key words and themes

Once having deconstructed or confirmed the emergent key words or 'themes', the designers defined these as key values that the product had to communicate and in some cases be evaluated against.
Having establishing a design direction verbally, all participants despite using either an informed or experience approach, explored how the base adjectives (or in their most primitive form - key words and themes) would manifest visually (figure 9).
The interviews revealed that those designers in the sample went about handling the visual stimuli in three main ways; visual boards, informal image collections and 'emergence spaces' (figure 10).

Despite all of the designers showing evidence of visual analysis, some participants went on to say that they believed it was the designer's role to subconsciously absorb visual stimuli. They portrayed design minds as 'sponges' for visual information that should naturally absorb visual stimuli and recall it at all the necessary point in the process of designing.

4.1 Visual boards
Some participants stated that a common way of handling visual stimuli was to generate visual boards or 'mood boards' (figure 11). Participants described this as a way of 'researching through design'. In some instances, the designers used the boards as a formal way of grouping images (representative of the key words) in order to present the findings to the client. This notion of visual boards aiding communication was supported by other participants, who described the visual material as helping to 'turn dialogue' and 'assist discussion' within the team. In some cases participants stated that in the context of visual boards, images were often difficult to interpret, which could result in confusing the client but stated that designers were much more able to pick an image off a visual board and 'run with it' in their design work.

4.2 Emergence Spaces
An 'emergence space' or 'image wall' was the term used by participants to describe their method of capturing visual stimuli. This was a process that began at the start of the design project, when the participant was analysing the research for emerging trends and relationships between discourses and commonalities within the market place. The designer collected the research and began to present it on the walls of an office space.
The emergence space (figure 12) was a way of physically surrounding a multidisciplinary team with all the project information, allowing team members with different specialisms to contribute to the 'space'. Interestingly, Participant 01 gave a novel description of the space; making connotations between the evidence trail of a crime scene and the way in which designers can map out a design direction as a result of relationships between various research and visual material that 'influence' and 'inform' them.

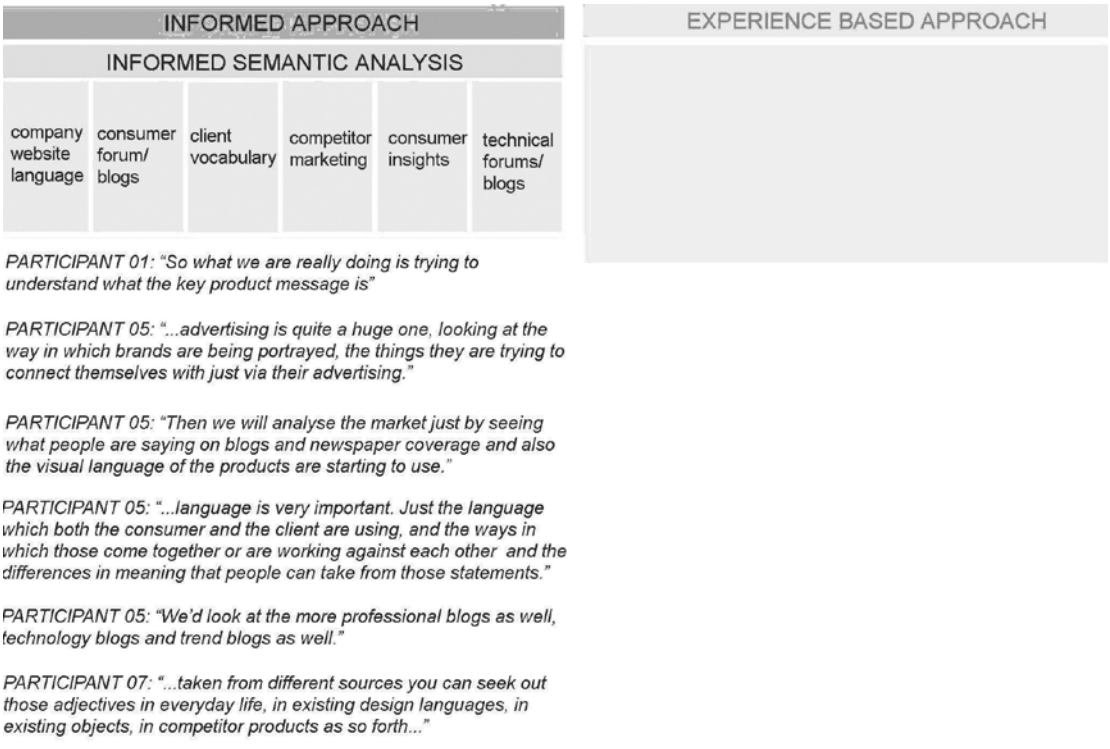

Figure 7 Qualitative evidence to support an informed semantic analysis

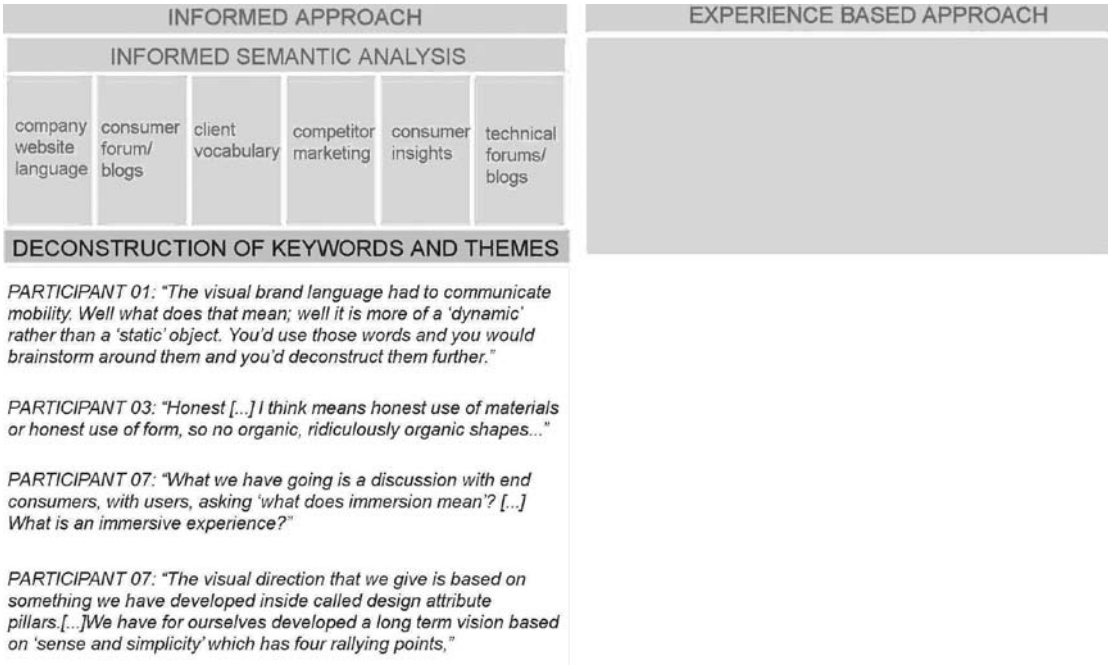

Figure 8 Qualitative evidence to support the deconstruction of keywords

4.3 Informal image collection

The final method observed was informal image collection (figure 13). Participants often turned to external product fields to draw-in visual stimuli into their design work. Most commonly it was the influences of car styling that inspired the designers. Participants expressed the need to be continually looking for visual information to inform design work. They revealed that despite having formal methods of presenting visual information like visual boards and emergence spaces, they independently used a standard pin board to collect visual material that they could later refer back to, when trying to understand brand values or adjectives assigned to a project.

5.0 Analysis of visual elements

Once the designers had captured visual stimuli, some participants showed evidence of breaking visual elements down to formulate an analytic understanding of 'form language' or 'design guidelines' (figure 14).

This was referred to by participant 05, as a document called the 'intent document'. This document comprised of a series of visual boards (outlining the visual semiotic

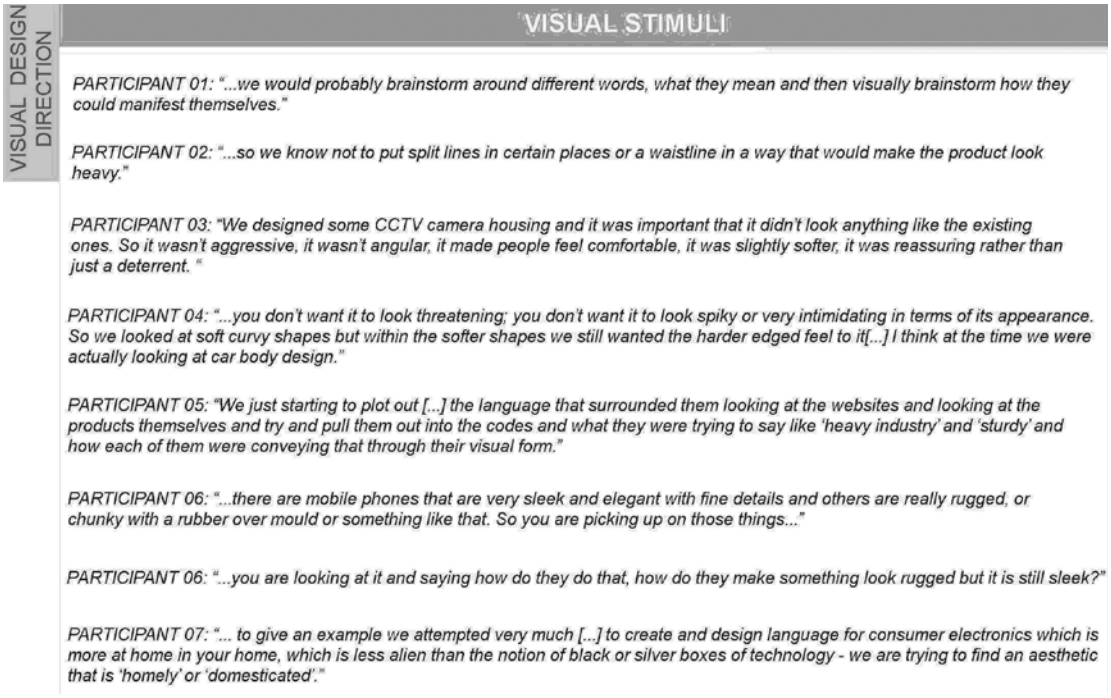

Figure 9 Qualitative evidence to support exploration how keywords manifest visually

Figure 10 Qualitative evidence to support visual boards, emergence spaces and informal image collections.

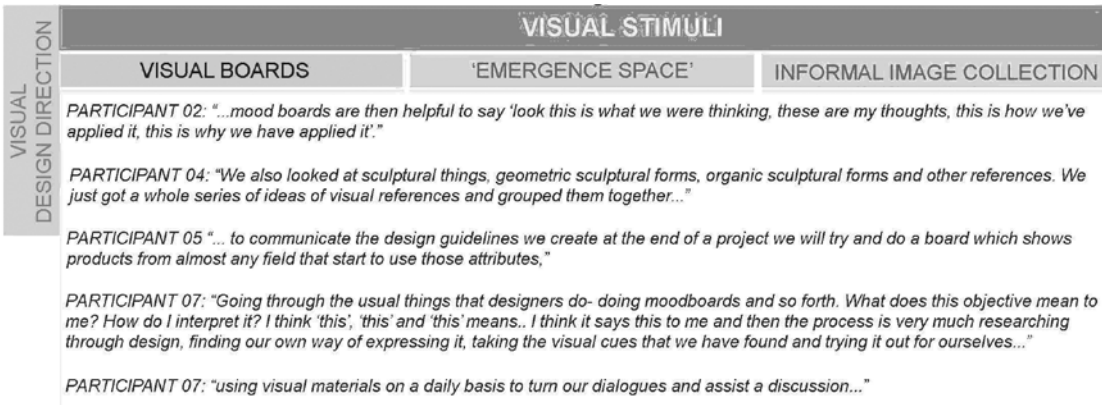

Figure 11 Qualitative evidence to support to use of visual boards

analysis) giving the design team guidance in establishing appropriate product form. The document presented the base adjectives that a product should convey and how these manifested into existing images. In some cases it went further to specify a semiotic formulation on which to base the product, for example the product should be 20 percent black and 80 percent silver in order to communicate the key words 'industrial scientific'.

Another participant went on to deconstruct visual images into four basic elements: brand, material/ finish, form and colour. The participant attempted to understand what elements of an image communicated a keyword or theme.

Surprisingly, despite efforts to ensure the best design direction is taken, there was little evidence to suggest a direct link exists between the captured visual stimuli and the designed outcome. The extent to which visual stimuli directly influenced the product form was not observable. Design decisions surrounding how the product should convey the correct message are seemingly still heavily dependant on the designer. It would seem logical therefore to propose a

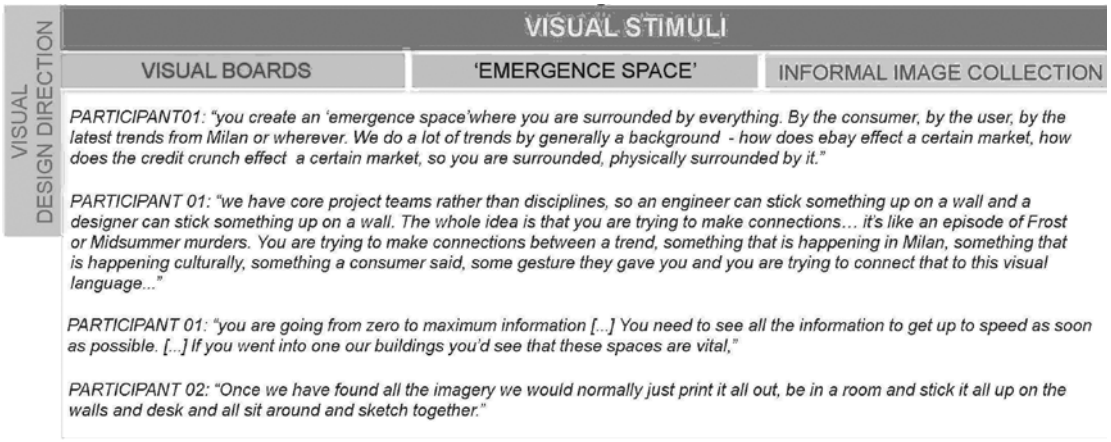

Figure 12 Qualitative evidence to support the use of emergence spaces

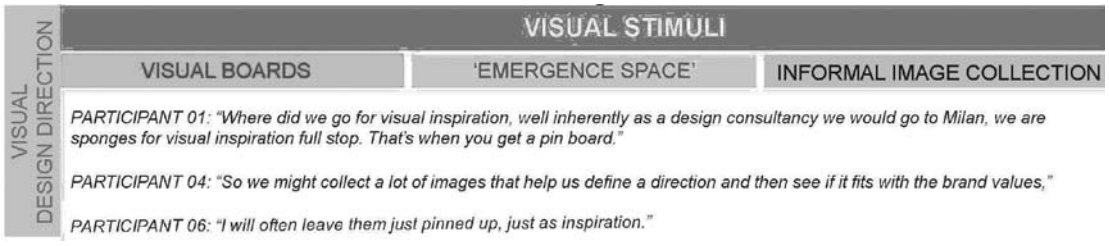

Figure 13 Qualitative evidence to support the use of informal image collections

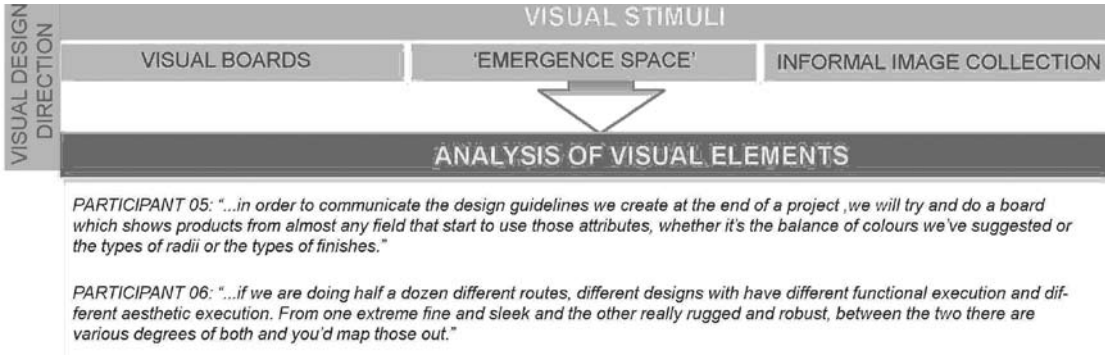

Figure 14 Qualitative evidence to support analysis of visual elements

methodology to help better integrate visual stimuli into the process of designing product form.

Participants stated that clients trusted the designer's judgement to make important design decisions and that they believed clients paid for the 'designerly magic' involved in executing appropriate designs. Participant 01 stated that although there was significant value in mapping processes and methodologies to aid design direction, when it 'came to the crunch' what something looked like was dependent on the designer – 'that is what they are good at, that is what they do'.

This gives an indication that a methodology (further deconstructing visual stimuli) might lower the client's perception of the designer's innate abilities and therefore not be entirely desirable in industry. However arguably, stakeholders in a product might prefer to rule out that risk of being dependant on an individual's experience and ability, supporting the adoption of such a methodology. The authors do not suggest that a designer's creativity should be limited but suggest benefits in a process to guide creativity constructively. This is to be the point of continued research.

Conclusion

There was evidence to suggest that there are existing processes undertaken by designers in establishing the most appropriate design direction. It is apparent from the results of the interviews to date that the designers questioned, in some form, consciously considered semantic values whilst initiating a design direction. These semantic values take their form in key words, base adjectives and themes.

The research reveals the important role that visual stimuli plays in formulating a design direction. Design direction can be initiated and explored verbally to

define product messages. Once keywords have been established, all participants perceived visual stimuli as being essential for understanding how the keywords would manifest into product form.

The extent to which this visual stimuli directly informed the process of designing product form and indeed product evaluation is still, at this stage, relatively unclear. Future research will also explore the potential for using material generated in the development of design direction as a means of aesthetic evaluation. It is envisaged that identifying the extent to which design direction directly influences design decisions will be the point of further analysis, with follow up interviews.

It is hoped that by further understanding these areas, the results will inform the evaluation of designer's current working processes and also explore the credibility of existing methodologies that aid designers in their pursuit of form.

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Research on the characteristics of regional culture and transformational design

Abstract
The objective of the research focuses on the investigation of cultural characteristics in Jhishanyen Cultural and Historical Park'. The aim is to search for local regional culture and pursue its symbolized items and images. Those items and images are further transformed to design and application. In order to find out cultural characteristics of Jhishanyen, designers worked on pattern design. Wanting to extract further cultural factors, the researchers conducted the interviews and questionnaire survey on local citizens. The subject focuses on activities of folk belief, historical relics, history, legendary tales and the biological landscape for the discussion. The data is collected and analyzed with three different research methods. There are: Factors Analysis, Cluster Analysis, and Regression. The research result concluded that product image may be divided into two main factors: 'historical mood' and 'environmental landscape'. The comments of product approval are made by two reasons: elegance and meaning. The preference is made by the image 'elegance'. The T-test is used to examine the difference of comments between the youth and the seniors. The data reveals no significant difference between two groups of participants. However, the data in Regression Analysis shows a slight difference among some approval factors.

Keyword:
regional culture, pattern, design transformation, products

1. Introduction

Cultural industry is one of the main elements of the development of global economy. Facing an ever-increasing international competition, culture has become a significant strategy to attract tourists and investment. Its central value lies in transformation and manipulation of cultural characteristics. Cultural product designing is an important factor in cultural industry. Its cultural characteristics reveal important cultural recognition and creative product differences. That's why the focus on the significance of culture, the creativity and the products of the reaction zone leads the connotation and characteristics to win in the fierce competition. In economy, design has been rapidly regarded as an important competition parameter (Li Pu-Liang, Lin Yi-Jun, 2004). Design creates product difference and attractiveness, combining creativity and aesthetics for marketing products. Consumers have learned new visions through the interaction of commodity practice and environment (Jeff Lewis, 2005). This research focuses on cases in Taiwan. The island has a complex geography and history; it contains multicultural areas and preserves its own unique landscape and cultural characteristics. Jhishanyen

district is an example. It attempts to extract cultural characteristics as design elements to develop graphic design, product design and added value. The goal enables researchers not only to participate in the local regional culture but also to understand the preferences and appreciation of the product. The process of understanding comes through the investigation of product image, built by a series of logics and estimation. The result can be used for related product development..

2. Literature Review

2.1 Cultural level

Li Yi-Yuan (1999) classified "culture" into three levels: (1) Material culture or technical culture: manufactured objects and typical forms are produced for overcoming the power of nature and staying alive. (2) Social group and ethical culture: people must interact, manage social lives and develop moral ethics, social norms, decrees, regulations, rules and so forth. (3) Spiritual culture and expressive culture: people must express their feelings and create art, music, literature, theatre and religion. Yang Yu-Fu (1998) extended these three levels into: Physical level, Middle level, and Metaphysical superior level. This article is based on literature. In this study we defined culture as "The reaction of overall life dimension includes knowledge, belief, art, moral, law, customs, the abilities and habits of social members etc." The three levels mentioned above are observable cultural materials. If you want to understand a certain group or regional culture, you have to understand its 'culture grammar' (Li Yi-Yuan, 1999). The purpose of cultural grammar is to understand better its central cultural value. For example, in Taiwanese culture, when you worship ancestors, you have to follow the rules imposed by folklore to select which ghost money and which items you need to sacrifice for each specific deity. As for the profound cultural meaning, it is a series of significant symbols. Take the sacrificial items as an example; they are a sort of physical worshipping tool in the 'observable culture'. On the contrary, as far as the 'invisible' point of view is concerned, it is a series of classified symbols. Culture has to be understood through an invisible symbolical dimension to grasp its real meaning.

Invisible culture is especially important to Taiwan's religions: some form of Yin-yang, the universe, ancestor worshipping, complex religions developed with deities and emanations, including Confucianism, Buddhism, Taoism and other related religions. Religion specialists classified those as folk beliefs or religions. The beliefs of most people belong to this category. Even non-religious people follow these traditional beliefs to a certain level (Li Yi-Yuan, 1978).

2.2 Introduction to Jhishanyen district

According to the historical book "Records of Jhishan Yan-Sheng-You Temple Stone God", more than 300 years ago, Zhangzhou and Quanzhou immigrants came to develop the wasteland. Zhangzhou immigrants named it Jhishanyen after a well-known site, Jhishanyen, in their hometown, Zhangzhou. The 1993 regulation of Preservation of Cultural Property Law by the Ministry of the interior proclaims that it is a level-2 historical site in Taipei (A measurable system for the importance of historical site developed by Taiwanese government). Taipei City Government combined cultural relics, historical constructions and environmental landscapes to establish 'Jhishanyen Cultural and Historical Park'. Jhishanyen District is located in the east-north of the Taipei basin. The area is approximately 10 acres large. The highest point above sea level reaches more or less 50 meters. The mountain altitude between flat and sea level is about 7-8 meters (Jhishanyen's website http://www.taconet.com.tw/dolphin/). In 1896, Japanese scientists discovered Taiwan's first archaeological site in Jhishanyen area . In 1981, the Department of Archaeology of Taiwan University found Jhishan's oldest relic dating back to over 3,500 years. It belongs to the same cultural stratum as the southeast coastal mainland relic. As a result of tectonic plate movement, the sand-stone deposit of Jhishanyen has shell detritus and sea urchin fossils. Hui-Ji Temple , located in Jhishanyen area has dominant god idols, including Saint King Zhang, Buddha and the Emperor of Studies. For those gods' anniversaries, a ceremony is frequently held by disciples who read sutras in celebration. The Emperor of Studies is placed on the second floor of the back temple. During every exam period, students swarm into the temple to pray for good luck in front of the god idol. They offer spring onions (sound alike intelligent), celeries (sound alike diligent) and carrot (sound alike fortunate) with admission cards in front of the god idol. Moreover, they may light up lights with their names on to pray for good luck for the exams.

During the Japanese Occupation in Taiwan, a teacher, Mr. Liu-Shi, was killed on Jhishanyen. The Japanese set

the temple for mourning the death of the teacher in the local place. In addition to that, there are immortal springs, religious sites, four god beasts guarding the four directions and relative legendary stories.
The flora of Jhishanyen includes easily remembered categories. It contains not only ''Bambusa pachinensis'' but also folk plants, four-season plants, ferns, colour changing plants, stranglers, particular species, special fruit and hundreds of kinds of other plants. The flora especially contains the Taiwan Shield Snail, the Black Drongo, the Muller's Barbet , the Black Bulbul, Swinhoe's japalura, Leptocoris Augur, butterflies, beetles and so on.

2.3 Cultural elements extract

Cultural elements stimulate the original concept of the design. Zheng Yu-Mei (2004) uses cultural elements and divides them into three types: "Signal-to-Symbol Transformation", "Real Role-Play Experience" and "Invisible Ideal Condition." The three different categories are divided into a more detailed classification with different methods. "Signal-to-Symbol Transformation" is not included in organic design in the natural environment. However, the environment influences the national economical life more than any other dimension (Yang Yu-Fu, 1999, p.228). Because the local environment affects its economic life and life styles, it forms particular cultural characteristics that are different from the others. According to the discussion above, this study developed a classification system as follow:
1. "Signal-to-Symbol Transformation": this refers to extract elements of formulation, symbols, marks, colors, material, cultural technical inheritance, natural organic design and so on. 2. "Real Role-Play Experience": this refers to the elements of transformational design from religions, historical legendary tales, folklore activity ceremonies, myths and customs. 3. "Invisible Ideal Condition": this refers to application elements including historical role-play, symbols, psychological conditions and relative dimensions.

3. Method

Research methods used in this study are divided into three steps. The first step is the extraction of cultural characteristics. It mainly combines literature, interviews and questionnaire. The researcher takes Correspondence Analysis method in SPSS Version 12 as an analysis data tool. The second one is design transformation. The researcher conducted the interviews and additional questionnaire survey on designers. The third one is the investigation and analysis of product image. The researcher uses Semantic Differential Method (SD Method), Factor Analysis, Hierarchical Cluster Analysis, Multiple Linear and Coefficients to analyze the data from product image.

3.1 Interview

The researchers carry on the preliminary interviews of residents in 'Jhishanyen Cultural and Historical Park'. The total number of interviewees is eight citizens and the average age is 50 years old. They have lived in the neighborhood for more than 20 years. These interviewees include ex-local officers and present local officers. The aim is to understand local cultural characteristics. The data collection will be used for further evaluation in the study.

3.2 Questionnaire

3.2-1 Discussion and selection of region culture and symbolism

Based on the interviews and literature information, ten topics of 'Jhishanyen Cultural and Historical Relic' have been selected. Those are nature, historical events, specific geology, archaeology, humanity, folk belief, education, leisure, legendary tales, ecology etc. Among those subjects, 21 cases presenting cultural characteristics are chosen. For example, there is a three hundred year old Camphor tree. This is one of the cases selected by local citizens according to those cultural characteristics.

3.2-2 Participant

The respondents total 27 residents (16 females, 11 males, the average age is 16-58). Based on the 21 groups, the research method is SPSS Version 12 for Correspondence Analysis. The research goal is to analyze the cultural characteristic dimensions of Jhishanyen.

3.3-3 Analysis result

The SPSS analysis obtained statistics (.000, degree of freedom 180). It indicates the relevance among the ten subjects and simultaneously maintained 2 variables. Its rate achieved 0.694 (> 0.5). The scores of the extract 2 dimensions are used for the analysis of later gathering

numbers. According to various instances and subjects, the two-dimensional score gathers in great number analysis (as chart 1). It may be divided into four groups, "history", "humanity" "geographical landscape" and "natural ecology". Those four dimensions form the characteristics and culture of Jhishanyen.

"History" covers "Archaeology" and "Historical events". "Archaeology" has related instances. Case 10: on Jhishanyen, the numbers, types and customs of containers can be used for an estimation of local life styles. Case 9: human culture is found on Jhishanyen. "History" has related cases. Case 13: Zhangzhou people establish four gates around Jhishanyen. Case 11: Zhangzhou immigrants who crossed the sea to Taiwan miss their hometown, Jhishan located in Zhangzhou, Fujian. Hence the new place's name as Jhishanyen. Case 19: during the era of Japanese Occupation in Taiwan, a teacher, Mr. Liu-Shi, was killed on Jhishanyen. The Japanese set the temple for mourning the death of the teacher in the local place.

"Humanity" covers "legendary tales" and "folk belief". The relative cases contain: Case 12: immortal springs, religious sites and relative legendary tales on Jhishanyen. Case 14: there are four god beasts guarding four directions; east gate (stone elephant), west gate (stone snake), south gate (stone horse) and north gate (stone lion). Case 15: the stone lion guarding north gate is located on the giant rock of the back temple. The stone is named Stone God. Case 16: Huiji Temple has dominant god idols, including Zhang Saint King in the front temple, Buddha on the first floor of the back temple and the Emperor of Studies on the second floor of the back temple. Case 17: four gods on the temple doors hold a sword, a pipa, an umbrella, a young dragon (snake) and so on. Those items are symbols of smooth winds and sufficient rain. Case 18: Emperor of Studies is placed on the second floor of the back Huiji Temple. A big writing brush named 'Pen of Studies' is put next to the column.

"Geographical landscape" covers "specific geology". The relative case contains: Case 1: the sandstone stratum of Jhishanyen has sea biological detritus, sea urchin fossils and relative shells. Case 2: there is a rock above the bat hole. The stone resembles radiated sun rays and is called "Solar Stone". Case 3: the giant rocks on Jhishanyen are under the influence of natural pressure and break into pieces in the straight dimension.

"Natural ecology" covers "education", "ecology", "nature" and "leisure". The relative instance includes: Case 6: on Jhishanyen, there are Black Drongo, Muller's Barbet and Black Bulbul. Case 7: there are Swinhoe's japalura, Gekkonidae and related animals. Case 8: there are Mogannia hebes walkers, Leptocoris augur, Dorcus schenklingi, butterflies, beetles and relative insects. Case 20: green trees and forests are filled with insects and birds that sing together on Jhishanyen. Case 21: there are many walkers in the mountains that visit Jhishanyen. Case 4 in 1925, a Japanese botanist, Y. Shimada, investigated 319 kinds of vascular plants on Jhishanyen. Diverse plants are grown in the local places. Case 5 there is a three hundred year old Camphor tree on Jhishanyen.

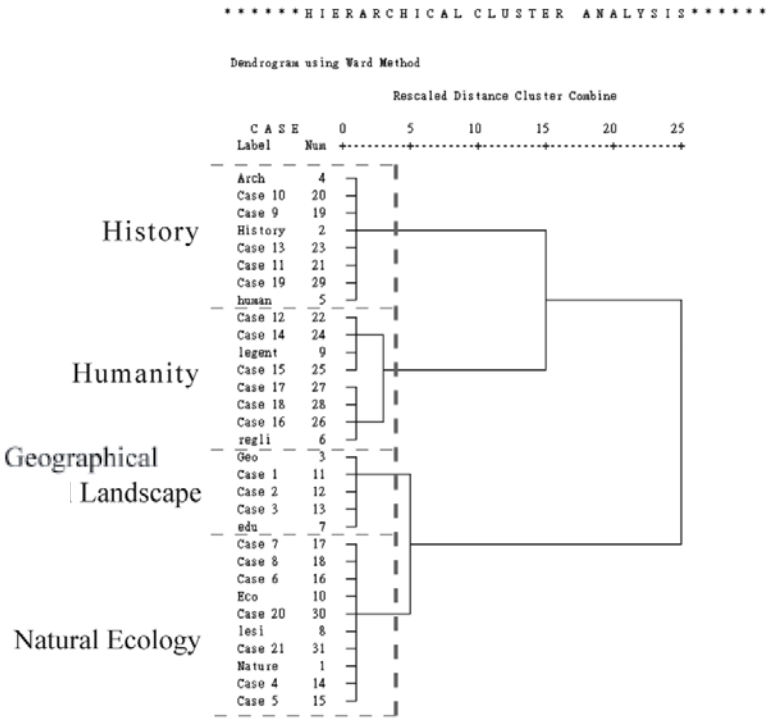

Chart 1: Cultural Characteristics and Dimensions of Zhishan Rock

3.3 Tranformational design and extract of cultural elements

It is based on the four dimensions of "history", "humanity", "geographical landscape" and "natural ecology". "History" is divided to two different subjects, "Archaeology" and "historical events". "Humanity" is divided into two subjects, "legendary tales" and "folk belief". "Geological landscape" is divided into "natural scene" and "artificial

History	Archaeology	Animal bones and Shell tombs in Jhishanyen Cultural Relic.
	Historical Events	Huiji Temple, stationery, gates, Jin-zi pavilion
Humanity	Legendary Tales	Four god beasts- Stone Lion, Stone Elephant, Stone Snake, Stone Horse
	Folk Belief	Sword, pipa, umbrella, snake, smooth winds and rain, Pen of Studies, Lights with names, Prayers for good luck at exams and sacrificial items: spring onions (sound alike intelligent), celeries (sound alike diligent) and carrot (sound alike fortunate). Incense burner, Safe charm.
Geological Landscape	Geology	Shell and sea urchin fossils. Bat hole, Solar Stone, joint, Stone Gate - the nose of the Stone Elephant
	Artificial Landscape	Sheep on the hill, Huiji Temple signs, eighteen gods, Huiji Temple (carps and carved designs for wall decoration)
Natural Ecology	Plants	Bambusa pachinensis, Schefflera octophylla, Alocasia macrorrhiza, Acacia confusa Merr, Chinese tallow-tree, Chinese soap berry, Formosan sweet gum Liquidambar, Macaranga, Broussonetia papyrifera, Lemmaphyllum microphyllum Presl, Nephrolepidaceae, Griffith Humata, Lygodium japonicum, Elaeocarpussylvestris, Chinese tallow-tree, Pieris taiwanensis, Ficus caulocarpa, Ficus septica, Small-leaved barringtonia, Ficus Vaccinioides Hemsl, Whit-flesh fig, Acacia confusa Merr, Malay Catchbird Tree
	Animals	Taiwan Shield Snail, Black Drongo, Muller's Barbet, Black Bulbul, Swinhoe's japalura, Red-bellied tree squirrel, Dorcus schenklingi, butterflies, Cicindela auralenta beetle.

Table 1: the subjects of design

(Cultural Resource) / (The Subject if the specimen)	Objective and Symbolic Transformation					Real Role-Play Experience			Invisible Ideal Condition		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1.Muller's Barbet			●		●						
2.Shell fossil	●										
3.Ficus septica			●		●						
4.Dorcus schenklingi					●						
5.HuiJi Temple signs+ Bambusa pachinensis	●	●	●		●						●
6.Trichia					●						
7.Cicindela auralenta beetle					●						
8.Solar Stone, Bat	●	●					●				
9.Red-bellied tree squirrel					●						
10.Swinhoe's japalura					●						
11.Pieris taiwanensis			●		●						
12.Chir Hanokdim	●		●		●						
13.Bambusa pachinensis		●									
14.Ficus septica(Fruit)					●						
15.Historical Relic(Deer)		●					●				
16.Smooth winds and rain		●				●	●				
17.The Top Rank (Spring Onion, Celery, Carrot)	●	●			●	●					
18.Brush and Red Carpet	●	●					●				
19.Gate	●						●				

Table 2: The extract of cultural elements

(1) Objective Form, (2) Symbolic Form, (3) Color Material, (4) Technical inheritance, (5) Organic Form,

(6) Folk Belief, (7) History and Legend, (8) Folk Activity, (9) Role Pay, (10) Ritualized Symbol,

(11) Psychological Situation

scene." "Natural ecology" is divided into two subjects, "flora" and "fauna". The related dimensions conclude local citizens select the subjects. According to the voting result, the researchers discussed with nine designers and transformed the design to pattern. We found some subjects are the symbols of Jhishanyen like old tomb groups and Tomb of Mr. Liu-Shi. The evaluation of folk belief, taboos and product preferences finalized the presentation themes of Table 1.
The total designers are nine. They are graduated students in the Department of Space Design. The average age is 23 years old. There are one male and eight females. Each one draws eight patterns. The theme of the patterns is not indicated. The due period is within 30 days. Through a series of discussion and revision, the final patterns are total 72.

3.4 The investigation and analysis of product image

3.4-1 Specimen Design:

Put those 19 patterns on handbags. The reason of selecting this product lies in its strong usage and does not involve with fashion.

3.4-2 Participant

Local citizens on Jhishanyen are a total of 34, including 16 teenagers. The average age of them is 14-25. 18 middle-aged citizens or seniors are included. The average age of them is 40-56.

3.4-3 Method

Print those 19 patterns on A4 paper. Have interviewees check their favorite adjective terms to describe their comments and preferences. Seven steps of description are evaluated to fit those adjective terms that come from literature and self-criticism.

3.4-4 Investigation and analysis of product image

3.4-4-1 Analysis of particular product structure

In order to study the main element of product structure, the researcher used SD method to analyze the main element and obtain the result. Because the two main grades reach 82.78%, and its value is over 1, the second main grade shows the output in Table 3. The first main element lies in-between several particular elements, "humanity – business", "revival- modern" and so on. That's why the concept "historical mood" can be explained. The concepts are formed by two factors, "revival" and "modern". The second main element

No.	Adjective Terms	Main Element	
		1	2
4	humanity – business	.938	-.221
2	revival- modern	.922	.030
9	Geological space – short time	.916	-.260
3	strong geological landscape – general geological landscape	.835	.267
7	Tale- lack of imagination	.826	-.401
8	Symbolization – Empty	.826	-.460
1	Natural Wind- Artificial	-.152	.948
6	Ecology-Destruction	-.373	.866
5	Religious Belief and no relationship with Religion	.618	-.676
10	Elegant-Rude	.325	.550
Specified Value		5.309	2.969
Rate		53.087%	29.694%
Total Result		53.087%	82.78%

Table 3: The analysis of main elements for product image

originates from the special factors, "natural wind - artificial" and "ecology - destruction." It can explain "environmental landscape". The opposition between "nature" and "artificial" forms the concept.

3.4-4-2 the reaction between product type and image

In order to find out the reaction between product type and image, the main element is put on the main axles of the image space. The purpose is to analyze the group and observe the relationship between handbag products and image. The purpose of Ward's Minimum Variance Method is to analyze four groups (chart 2, chart 3). Product samples of the four groups are illustrated as chart 4. Its visual characteristics indicate that graph G1 imitates natural 'organic' design. The meaning of the symbol is weak and is briefly called "natural style." Graph G2 is transformed to folk belief and lives. The meaning of this symbol is strong. Graph G3 is transformed from a historical structure. It is prone to point to some axles. The meaning of the local symbol is stronger and called 'Wind and Soil Style.' The cultural element of Graph G4 comes from geography, particular plants and History. Because of model and color modernism, the meaning of the opposition is weak and briefly called 'Time Style.'

3.4-4-3 Causation of "approval, preference" rating and image of product

In order to understand the cause-effect relationship

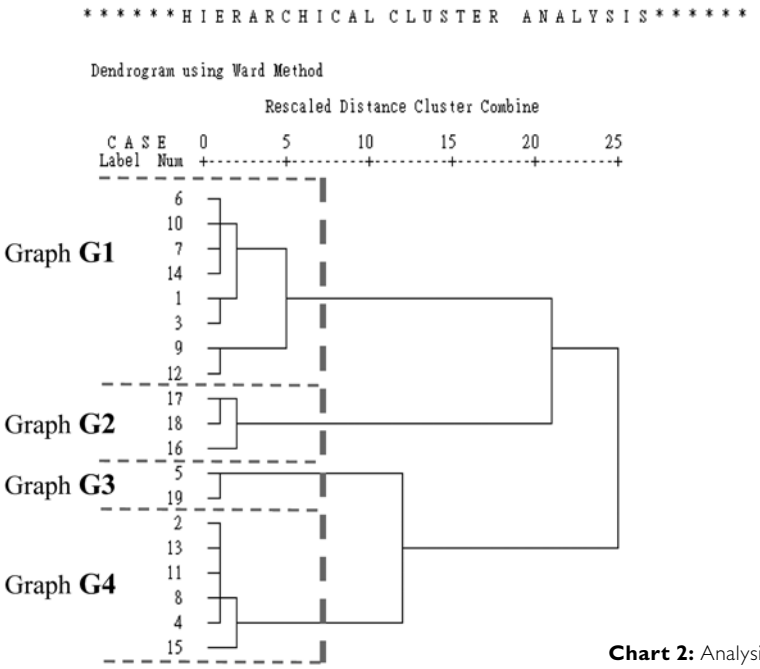

Chart 2: Analysis result of gathering groups

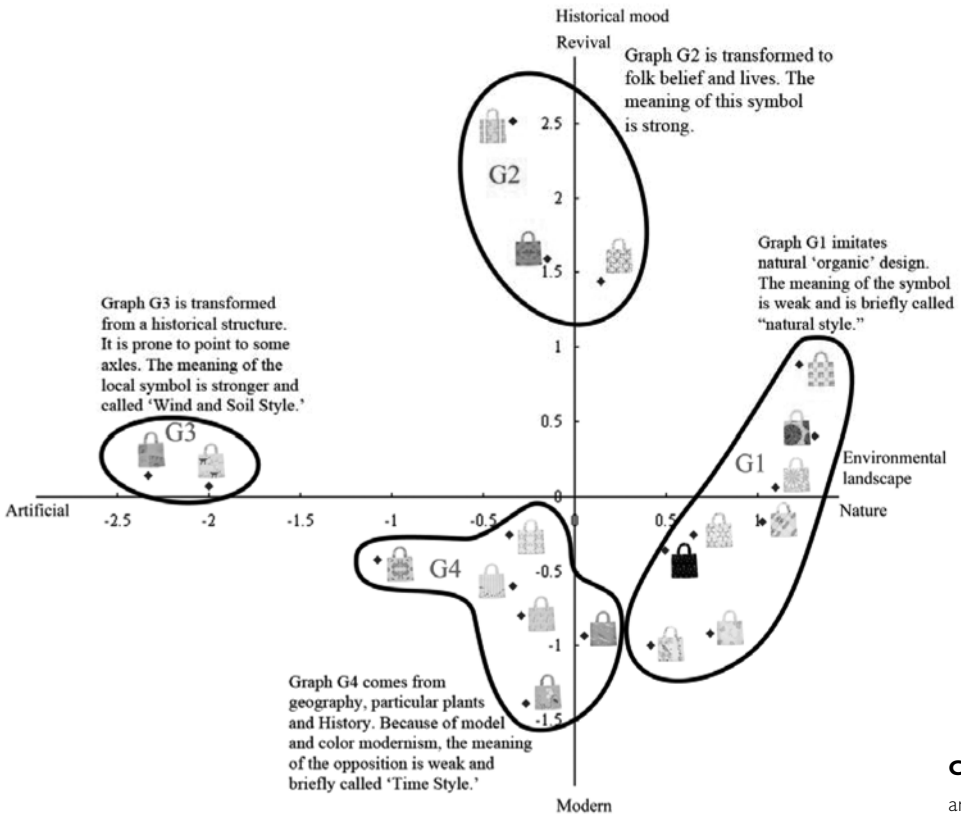

Chart 3: The scatter plot matrix of product image and space. (The first and second main factors)

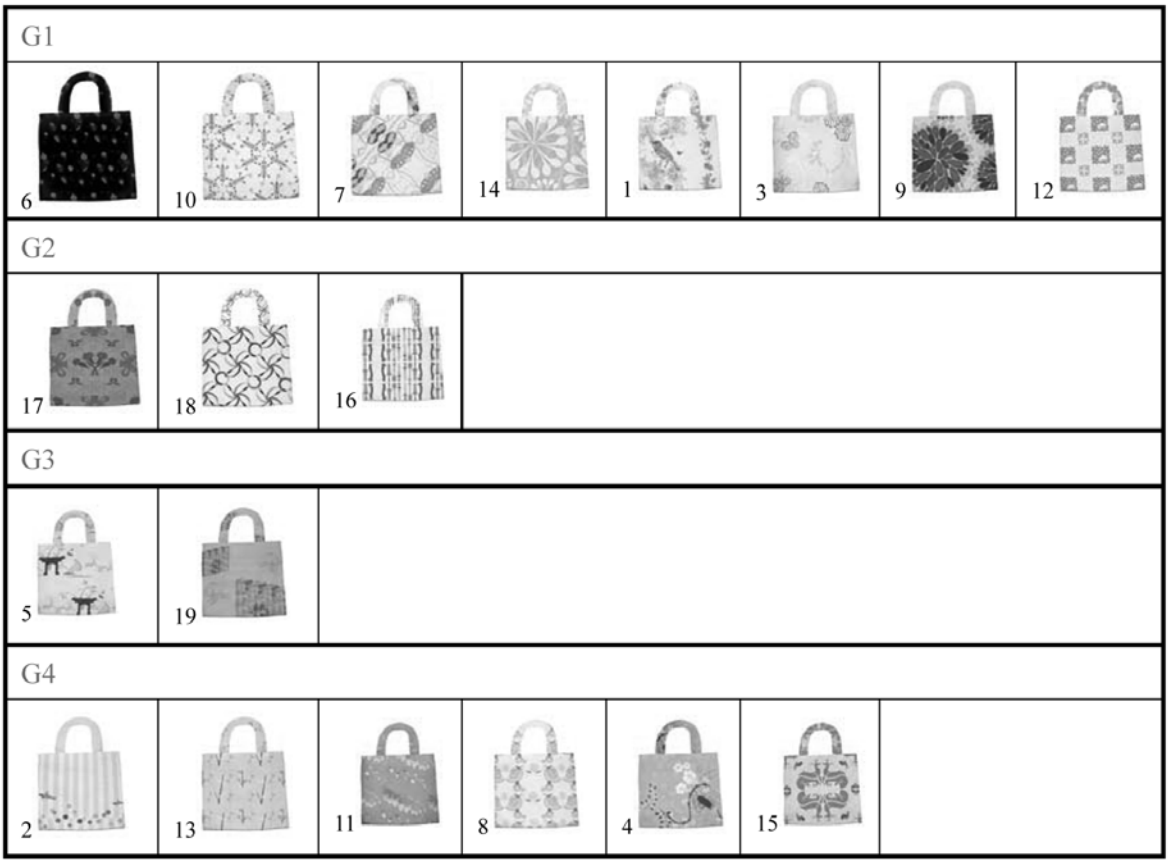

Chart 4: The illustration of product groups

of "approval, preference" rating and image of product, the study in this stage employs "approval-feeling discommendable" as dependent variables and other images are included as dependent variables, According to Regression analysis, the result shows on table 4 that the average R-value is .627. So that goodness-of-fit is acceptable. Furthermore, the significant of 'elegant' is less than 0.005 and the significant of story plots is 0.005. It reveals the elements of those bags from the formulation of elegance and stories. The observation of groups indicated the image of inner meanings. Hence the Regression equation of approval is:

Before being standardized
Approval = 'Elegance' x 536 + 'Inner Meaning' x 246 + 380

Take "likes-dislikes" as dependent values. Other images are valuable and are analyzed through Multiple Linear Regression. The result is shown on Table 5. The conclusion reveals that R squared value is .412. So that the data showed the factor of 'elegance' might affects the trend of 'preference'. However, other factors of this study are unknown, this section will be discussed in future research. The significant value of 'elegance' is less than 0.005, indicate that local citizens like the pattern of these handbags because of the image 'elegance'. Take the factor 'elegance' for further 'Sophisticated'. Hence the Regression equation of like is:

Before being standardized,
Like = 'Elegance' x .561+.981

3.4-4-4 Cause and effect of comments and approval in the two groups

The purpose is to understand the difference of comments on the cultural products between the youth and seniors. Both sides' comments are analyzed with T-test methods. The result shows no significant differences. From the data in coefficients, the factors are slightly different. It explains that the seniors' appreciations are mainly influenced by the elegant, symbolized and ecological factors of product approval. But the youths add more humanity to increase their product approval.

4. Conclusions and Suggestions

4.1 Conclusions

Cultural characteristics are the main concepts for

product design. After the analysis of both groups, two main factors are (1) historical mood and (2) environmental landscape. The latter is formed by biological landscape and geological landscape. Biological landscape belongs to natural ecology. Geological landscape contains natural and artificial landscape. Cultural factors are mostly extracted from Signal-to-Symbol Transformation. It mainly focuses on the organic design, container formulation and symbol marks. The former two factors are easily transformed and highly accepted. As for symbol marks, if the meaning is fortunate, the luck against disaster is more accepted. Though elements of the subjects are cultural symbols, they are direful in religious belief. When the symbols are transformed to patterns, the patterns may be limited on the application of the products in a certain level.

In the axel of "historical mood", three main nostalgia subjects are the top ranks (celery, spring onion and carrot), the brush, smooth winds and rain. The 'happy' symbol is strong. In the axel of environmental landscape, there are two product subjects: one is 'gate' and the other is the combination of HuiJi Temple signs and Bambusa pachinensis. The local symbol is strong and cultural identification is high. From above all, verbose graph and traditional custom are designed as symbols and formed as identification and useful conditions.

Thirty-four citizens' comments are used for the investigation of the product image. Most of them agreed that R-square value is .627. The value is in the accepted range. Two factors of elegance and meanings can be further used for explaining the feelings of elegance and culture. Those are the possible factors for local citizens to agree with the product design. The difference of the comments between the youth and seniors is less significant. However, from the data in Coefficients, factors are different, which may explain the seniors' concepts. They mainly evaluate more about elegant, symbolized and natural factors. In this way, those factors influence the product approval. But, the youth are prone to involve with humanity factor to increase their product approval. From the data in Coefficients, the factors of favor and approval are found. Elegance image is one of the main factors. Obviously, cultural product design may be involved in the image of the elegance to increase the standard of the preference and approval.

4.2 Suggestions

As for the approval in Coefficients, the match standard is only suitable for the acceptable range. That's why, except for two factors, elegance and meanings, there are still other unknown elements. In the future study, the image terms may be revised. Furthermore, the interviewees and non-local citizens may be consulted for the completion of the research. Those mentioned patterns may be applicable to other products. The researcher may examine whether the testing result reveals the same image or not. If the outcome is the same, design transformation mode of those cultural products may be meaningful.

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Event, ceremony and trash. About the production and avoidance of semiotic pollution by design.

Introduction

Following today's representation forms of corporations – sufficiently known as marketing or advertisement – an interesting phenomenon shows up. Under the influence of social, economic and ecological currents or requirements the contextual development of communication and the type of the representation changed. However not in the same but rather into different directions. We can examine this with several examples.

The international automobile exhibition (IAA) in Frankfurt/Main 2007 revealed it clearly. All leading car manufacturers emphasized the very same thing in their fair presentation, more or less developed Concepts of "zero-" or "low-emission-cars". Driven by a global discussion about carbon dioxide and its effects on climate, it just isn't enough to give answers to energy consumption levels. The big corporations have to present themselves as acting responsible and sustainable.

The presentations, however, of these concepts and requirements for the future obviously were held in the habit usually encountered at monstrous car-shows; Especially the German car-producers (BMW, Mercedes-Benz, Volkswagen/Audi) occupied whole fair-halls or erected temporarily halls just for the fortnight period of the venue. Multi-medial scenes, multiple floors connected by escalators and 500 hp prototypes put on display presented quite a different picture. The highlighted energy efficient future of mobility was driven to absurdity. The exhibition of any brand simply didn't match the message about sustainability and ecological responsibility.

Another example is found in companies seeking for green certification and also within our discipline Green-Design is defined by "Life Cycle Impact Assessments". All this is based on unchanged traditional communication strategies, furthermore from ubiquitous brand communication via cross media publishing arises a new fight for attention, consuming even more resources. We are witnessing an arms race about bigger shows that leads to a point where a product's presentation becomes inappropriate, even if the product itself might by the most sustainable thing ever.

Also the corresponding literature supplies a long line-up of sufficient reference points for this development, in which each message is first decontextualized to be freely reproduced in new contexts. Whether one uses "the seven psychological mechanisms of dramaturgy […] to involve and activate the consumers"[1] or as Norbert Bolz proclaims the "emotional design", which deals with the ritual production of topics, life styles and conceptions of the world and with trends to be "religion without dogma". Both describe a non-binding and

[1] Christian MIKUNDA, Der verbotene Ort oder die inszenierte Verführung : unwiderstehliches Marketing durch strategische Dramaturgie. / Frankfurt, Main: Redline Wirtschaft, 2005

massive communication of values, which is not worth the paper it is published on.

So, if the medium – according to Marshall McLuhan – is the message, how do we the receivers, users and consumers have to understand such messages? In all cases one can notice that the message does not tune with the selected media of the brand experience any more. Especially as designers we have to confront ourselves with the difficult question, how to deal with the upcoming requirements, frameworks and antagonisms.

Focus

All branches within the design disciplin are more or less affected by this question, however, a result-oriented view on the problem requires a certain focus. For this reason the investigation regards above all the field of designing experience, an interdisciplinary approach, which – in the Anglo-American linguistic usage – is called experience-design. The object of design is thereby the moment of interaction between medium and receiver, the moment of knowledge-making. The Experience Design Group (EDG)[2] outlined the term by means of three experience ranges, these are: "persuasive experience", "environmental experience" and "humanitarian experience".[3]

Object of research

The research thus leads to the central moment, in which a shapeable and manipulable event becomes a perceptible deepening experience with deep impact. To understand the functionality of these conversions and to draw conclusions on how to handle the design-challenge, is core-objective of the research project. Because the deriving daily cataclysm of symbols and signs, that we have to sort and digest, appears as mental pollution. More than ever arises the necessity for responsible use of the semantics of experience-design. The shift of paradigms that took place in product-design and engineering has to have an impact on the communication of brands, life-styles and responsibilities as well.

This thesis searches for these possibilities of change and tries to give answers to the questions coming up: Can design help to bias medium and message again? Can design contribute to change not only the consumption-product, but also its consumption-process? Can the vicious circle of communication overflow be interrupted? And last but not least which effects would be produced by putting something on stage that can bring out almost physical experiences from sensual perceptions?

Structure

The work is divided in three central parts of research. In the first part the theoretical bases for the research is examined and clarified both within and outside of the discipline: the research about design. The second step is planned to be an observation on the basis of an intensive visual research. A typology will be developed to evaluate the diverse case studies. This represents a research by design. Supplementing, parallel and concluding, in a third part of excursions, different approaches are to be examined, which already developed possible strategies or techniques or feature comparable approaches, those could be applicable to the devised question, thus a research for design.

Research about design

A consistent gathering of already existing theoretical and practical appendages particularly within and also outside of the discipline forms the basis of the research. Supplementing the most important terms of the field of research and their connections must be regarded, both in the scientific definition and in the general-linguistic use.

Research by design

An analytic comparison of diverse ceremonies, events and pageant as well as interviews with the different producers of the symbols should point out approaches and strategies for possible ways out of the dilemma. The evaluation and/or assessment, regarding most diverse factors such as effect, congruence, conversion or sustainability is the crucial step to possible theses, realizations, strategies and starting-points for future design-processes of event and experience or of medium and message. For this reason a system of typologies is to be developed that makes a categorization possible. Therefore the research is getting comparable and accessible for an evaluation.

Research for design

By means of some excursions different strategies and approaches are to be included into the project. These

[2] Department of Intersdisciplinary Studies, Konstfack University College of Arts, Crafts and Design, Stockholm, Sweden

[3] http://www.designtime.se/


SZENE
GO KARTING.
SHOWTIME
KNOWLEDGE TO EAT


LIANCE CATHOLIQUE
1959
1901
of
any
thing
?
WE
ARE
MADE
OF
307
STAN
This is not
a photo
opportunity


Gottesdienste
„Das Publikum tanzt die Polizei vom Platz"
ACT NOW
Interessenverbände
EMPTY WARHEAD
FOUND IN WHITE HOUSE


Manipulation Accomplished
5:30
DAS DORNBRACH RITUALBAD
O2 World
Guest
Frankfurt am Main, 17.7.2008
O2 World on tour
Presse / VIP Mobile Ticket

currents are observed or described by authors from within and beyond the design discipline.

So since the days of the Ulmer "Hochschule für Gestaltung" designers are aware of the social responsibility inherent in their products and design.[4]

That lets assume that first references for a possible approach might be even found in early publications within the discipline. In addition, actual key words and terminology point to an argument with the topic of the designers' semantic liability. At this point it is necessary to engage into closer investigations of terms like designthinking[5], greendesign, branded environment, conscientous design ,[6,7,8] and further on.

In addition there are contributors at the edges of the design discipline to be discussed that grab strategies from others in order to use them for their own purposes. Driven by cost saving many NGOs act this way, creating communication and event strategies very similar to those of their chosen enemies. Last but not least reverting known rituals and ceremonies is also a kind of strategy takeover and here the wheel turns full circle: We should take a closer look to the function of these ritual productions as did before e.g. Norbert Bolz, Harald Gründl, Christian Mikunda and many others. But there is not only the design related discussion on the risks and possibilities of the struggle for attention. Georg Franck completed in 1998 his theory "Die Ökonomie der Aufmerksamkeit"[9] (The Economy of Attention) which is still valid today. Luc Boltanski and Eve Chiapello analysis "Der neue Geist des Kapitalismus"[10] (The New Spirit of Capitalism) proved that even critical reflections about capitalism have a chance of perception.

Conclusion

For a final contextualization of the research, the results from the typological investigation have to be compared necessarily with the worked out strategies and approaches from within and beyond of the disciplinary borders. Only by this unification one is able to see, how a possible formulation for responsible designing at the transition from event to experience might be shaped.

In order to make it possible for the lecture to give a deeper view into the research work (which is at its beginning) it is planned, to persue the concluding procedure by means of a specific example and discussing potentials for the results of the research project by contextualizing on the concrete event.

[4] vgl. Tomàs Maldonado, ulm 6. Zeitschrift der Hochschule für Gestaltung. Ulm: HfG Ulm, 1962, Vorwort

[5] http://www.hbsp.harvard.edu/hbsp/hbr/articles/article.jsp?OPERATION_TYPE=CHECK_COOKIE&referer=/hbsp/hbr/articles/article.jsp &productId=R0806E&TRUE=TRUE&reason=freeContent& FALSE= FALSE&ml_subscriber=true&_requestid= 5416&ml_action =get-article&ml_issueid=BR0806&articleID= R0806E&pageNumber=3

[6] Kalle Lasn, Culture Jamming. Die Rückeroberung der Zeichen. / Frankfurt/Main: Büchergilde, 2005

[7] http://www.dexigner.com/product/announcements-g1501.html

[8] http://pingmag.jp/category/conscientious-design/

[9] Georg Franck, Die Ökonomie der Aufmerksamkeit. Ein Entwurf München, Wien: Carl Hanser Verlag, 1998

[10] Luc Boltanski / Eve Chiapello, Der neue Geist des Kapitalismus. Konstanz : UVK-Verl.-Ges., 2006, Brosch. Ausg.

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Black box consumption? Form the targeted transfer of information to the context-based allocation of meaning

Abstract
The following text traces the key points of product language theory and the environment during its creation. A subsequent description of current consumer practices shows that this model is no longer sufficient for demonstrating the context-based allocation of meaning. I therefore propose a theoretical model that can demonstrate these new features and thus open up new opportunities for research in design science.

Introduction

Today, products are no longer primarily bought based on their practical value or a good price-performance ratio (Ulrich 2006: 10). Their ability to symbolise a sense of belonging or values and to enable people to identify with them are far more important. Product language theory pushed this consumer perspective into the focus of design theory for the first time in the mid 1970s. As part of this theoretical approach, emblematic meanings were to be deliberately created using design tools, so as to appeal to consumers in specific target groups (Steffen 2000: 6). Back in the early 1990s, Schulze discovered universal participation in lifestyles in a sociocultural study (Schulze 1994). However, this clear stylistic direction is now barely to be found in our current consumer culture. Instead, belonging to groups and style characteristics are intermixed, collaged together or modified to become brand, product and identity hybrids.

On the creation of product language

The political discourses in the years that followed 1968 also had their equivalents in a critical evaluation of product design and consumer practice. Design theorists such as Tomás Maldonado complained about the "artificially-accelerated ageing" (Selle 1987: 274) of products, which aimed to increase consumption. Radical thought was also given to the economic system, for example in Wolfgang Fritz Haug's Critique of Commodity Aesthetics (1971). Viewed from today's perspective, the emergence of ecological issues in the debate is particularly interesting. Jochen Gros called for more emotional product aesthetics from this angle in 1974, for example. His thesis Weniger Konsum durch mehr Sinnlichkeit – Less Consumption through more Sensuality (IDZ 1974: 58) called for a personal relationship with objects, which, together with aesthetic-based ageing, was to result in long-term use. The starting point for this new view of products was the criticism of functionalism, which had already been occupying Gros for some time. In 1973, he called for an extended form of functionalism, which would take the "mental and social dimensions of design" (Steffen 2000: 7) into account more. Together with Richard Fischer, he then worked on creating the theoretical foundations for the emblematic functions of products at the HfG Offenbach. The findings of his research resulted in the "theory of product language" (Gros 1983), which was similar to the notion of "product semantics"

(Krippendorff 1984), a term used in English-speaking countries. Both theoretical approaches represented the transition from natural science-based thinking to humanities-based thinking in design almost simultaneously.

As the term "product language" implies, linguistic theories play a key role in the foundations of this theory. Particularly noteworthy in this respect is the American philosopher Susanne K. Langer, who provided a definition of signs and symbols for the first time in her work Philosophy in a New Key. Theses by the Czech linguist Jan Mukař ovský were also used to create the theory. Based on a linguistic approach, he replaced the notion of beauty with that of function and then differentiated practical from symbolic functions (Bürdek 2005: 234, Steffen 200: 10). The Italian semiotician Umberto Eco was also included. In his Introduction to Semiotics, he implicitly refers to the universality of his approach: "Semiotics examines all cultural processes as communication processes. It aims to show how cultural processes are based on systems" (Eco 1994: 38). Codes are particularly significant as they contain symbols that are encoded by a sender and decoded by a receiver. The sender-receiver model also forms the foundations for the theory of product language. The "interplay between formal design tools and their semantic meanings in a social and cultural context" has to be identified in order to design products "that convey specific information and generate a specific impact" on this basis (Steffen 200: 6). The active appropriation process, which can also result in the reinterpretation of product statements, is not reflected in this model, however. From today's perspective, I would refer to a connotative approach in investigating product communication. In the following, I would like to show that the communicative form of appropriation in particular plays a crucial role in how products are received today.

Consumption today

The abundance of consumption has, together with the omnipresence of design, lead to subtle differentiations in reception skills in market economy-driven societies. Over the years, this has created everyday knowledge that "may vary from one generation, social group or lifestyle to another and lead to different types of interaction skills" (Hörning, 2001: 14). Yet the individual also no longer leads a linear, consistent life of consumption. On the contrary, a wide range of different experiences is expressly desired, as media theorist Wolfgang Ulrich impressively describes in his book Habenwollen (Ulrich 2006: 167). Buyers thus develop active strategies to remove products from the anonymity of the world of commodities and to transfer them into their own personal ownership. The spectrum of appropriation strategies here ranges from personal configuration through to making extensive changes to the product (cf. Schwer 2008). When this situation is interpreted based on the sender-receiver model, however, the actions of consumers simply appear to be chaotic, haphazard and unpredictable. New models are therefore required in order to convey and understand the sharp increase in complexity in the field. To me, a reception-based theoretical approach seems to be a sensible option because it draws on the open ness of the significance and meaning of products as a starting point. Meaning is therefore created only by merging the different meanings on offer with the different horizons of expectation, understanding and education of the beholder.

People-object relations from a system theory perspective

If you place the productive, non-controllable consumers at the centre of design theory research, Luhmann's sociological system theory offers interesting connections. Epistemologically, this school of thought is based on radical constructivism. Subsequently, as biological, psychological and social systems, we have no direct access to a reality that might exist. On the contrary: knowledge is always based on individual perceptions and meaning-constructing processes. If you think of the different connotations that products trigger among recipients, some of which vary greatly, this point of view appears to be profoundly evident. The communication model created on this basis differs dramatically from the sender-receiver model addressed above. The metaphors of a transfer of information draw attention to the skills required by the person giving the information (Luhmann 1984: 193f). In light of this, Luhmann focuses on understanding, that is to say, how the recipient puts together the information. His model also divides communication into individual, interconnected communication acts that are continually self-generated and that combine together

to form structures (Schuldt 2003: 42). An individual communication act comprises a three-stage selection of information, message and understanding. To explain this complex process, I would like to draw on an example from the sociologists Georg Kneer and Armin Nassehi, which presents a conversation between a doctor and a patient (Kneer/Nassehi 2000: 82 ff). The situation: the doctor asks the patient how he is – the patient answers in a connecting communication act that he has pain in his right arm – the doctor asks in another connecting communication act how long he has had this pain. Let us now look at the individual selections within this communication system:

Selection 1 "Information": the discussion context provides a horizon of reference. The doctor decides to select an item of information from this horizon of reference and to convey this information. The question "How are you?" also contains information. In our example, the doctor has time to see to the patient at this present moment in time. She chooses this information and decides to convey it.
Selection 2 "Message": the doctor selects the way in which to pass on the information that she has time for the patient now using language and questions. However, she could also convey this using a gesture, eye contact or another sentence.
Selection 3 "Understanding": the communication act is only completed once this information / message difference is understood and this understanding is conveyed in a connecting communication. The patient's reply "I have pain in my right arm" shows that he has understood but is also the result of another information / message difference. However, the patient could interpret the doctor's question in a different way and convey this using the sentence "Apart from some troubles with my wife, not bad", for example. This understanding then opens up quite different connecting communication options in the conversation.
However, the term "communication" in this context not only refers to personal conversations but also to direct interaction. Information can also be conveyed using another medium: from the writer to the reader through writing or from the producer to the consumer via a product, for example. Understanding is then conveyed in the form of a reader's letter in response to a newspaper article or by ignoring a neighbour in response to their purchase of a luxury car, for example.

Connectivity is determined by meaning. The fundamental difference between what is currently a given and what is possible due to this given fact contained within the meaning or the experience of meaning enables differences from the possibilities that are still open to be re-assimilated, to be collected, to be stereotyped, to be schematised and for an information value to be gained from the update that then follows (Luhmann 1984: 112). Meaning consequently not only entails the selection of information; it also creates a link to possibilities that have not been selected. To make this additional complexity of the notion of meaning more manageable in terms of observing it, Luhmann introduced three different differences:

1. Subject dimension: this breaks down the reference structure of the designated items into this and that (Luhmann 1987: 114). In the context of product communication, this relates to the connectivity of the practical functions (Hellmann 2003: 304).
2. Time dimension: this is constituted of the before and after. It is independent and is therefore not based on the who/what/how/what of experience and actions – this means that it is chronologised or linearised. In the context of products, the time dimension describes connectivity with regard to tradition and history or the news value (Hellmann 2003: 306).
3. Social dimension: this dimension asks whether someone else experiences the meaning in the same way as I do or differently. Consequently, many alter ego perspectives are also possible in addition to the ego perspective. Luhmann describes this as follows: "The social dimension allows, where available, a continuous comparison of that which others can experience or would experience and how others could set their behaviour" (Luhmann 1987: 121). From a sociology of consumption perspective, this dimension of meaning examines connectivity with regard to demographic, psychological and sociological aspects (Hellmann 2003: 306).
As I outlined earlier, I find the process of appropriation and product reinterpretation interesting with regard to design research analysis. I therefore extend the range of dimensions of meaning to include an "experience dimension". This shall investigate "internal-oriented goals" in product reception, as described in Schulze's Kultursoziologie der Gegenwart – Cultural Sociology Today (Schulze 1994). Key to this dimension is

that the external-oriented circumstances are no longer experienced (social dimension); instead, they are perceived to be pleasant after being processed internally.

This analytical tool enables products to be viewed as messages from a "product-generating system" to its surrounding environment and also to understand products as messages from a "product-using system" to its surrounding environment. This reveals the different levels and relations and their connectivity for further communications. It is therefore concerned with incorporating and examining context in product communications. Examining the new research opportunities resulting from this different view of product communications is the aim of my design research approach.

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David Teubner

Form generation through styling cue synthesis

Definition of the research

Before students can learn to draw, they must discover that drawing is not only the result of ideas; but a powerful, idea-generating tool as well. Staring at blank paper results in nothing, but encouraging the hand and mind to work together in a creative process often leads to surprising results.
There is no lack of inspiration for generating architectural space or for laying out graphic pages, but little has been offered to industrial designers for the generation of three-dimensional artifacts or consumer products.
Cue Synthesis is one of several, form-generating methodologies that I am developing to help industrial designers move from blank page to tangible form.
It is a systematic approach that stimulates creativity, provides inspiration and leads the designer to discover new solutions.

Step 1: Understanding styling cues and visual language

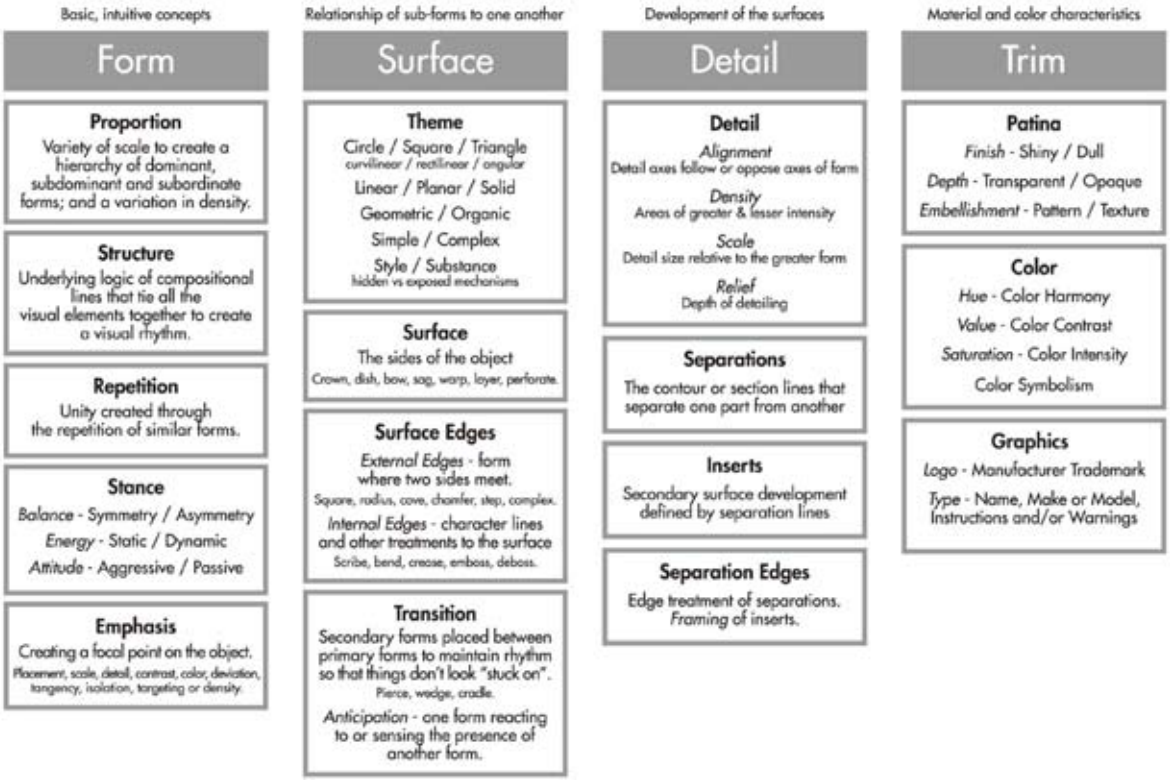
Before the process begins, it is necessary to give the designer a tool with which to identify the Styling Cues that define a visual language. This chart is a comprehensive list of terms that represent the elements of visual semantics. It separates the characteristics of three-dimensional form into four, distinct levels of concentration progressing from general to increasingly, specific details. The first level, Form, concerns itself with basic, intuitive concepts. Surface, the second level, concentrates on the relationship of sub-forms to one another. Detail, the third level, takes a closer look at the development of the surfaces. Trim, the fourth level, concentrates on material and color characteristics. Thus, the unique treatment of each term represents a single, Styling Cue, and together they form a visual language or style.

Fig. 01 Cue Chart is a synthesis of inspiration from many books, most notably Elements of Design (2002) by Gail Hannah, Principles of Form and Design (1993) by Wucius Wong, and Graphic Design Processes (1992) by Kenneth Hiebert. Additional inspiration arrived through discussions with colleagues and my own need to explain things to my students.

Step 2: Generating a configuration drawing

For the process to begin, you need something to design – a toaster. A toaster needs specific components to function. It needs toasting slots for the bread, a base to house the mechanism, a switch to control the mechanism, and handles to pick it up.
A configuration drawing takes these basic components and recombines them in as many different ways as possible. It is kept simple, boxy and without style. The number of times a component is used can vary, as well as the relative placement of one to another, and its orientation in space. Several of the following examples are unusual and prove that innovation begins at the configuration stage.

Fig. 01 Cue Chart



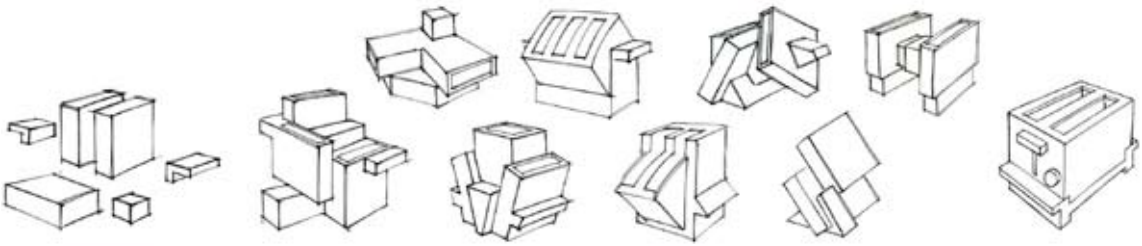


Fig. 02 Configuration

Many configurations offer the potential for many solutions as each of these could be used, in turn, to demonstrate the process but, as it is an exercise in styling, I will use the simple configuration on the right.

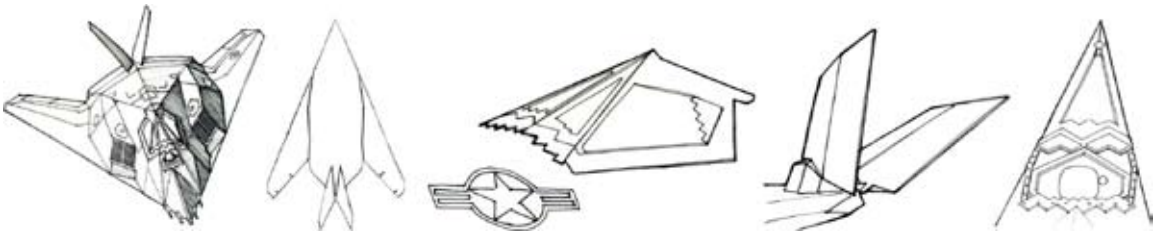
Step 3: Choosing two objects

The key to this methodology is the selection and analysis of two, existing styles that are shuffled together to create an entirely new look. The third step then, is to find two, dissimilar objects that are visually different from each other and also different from the object you are designing. I have chosen a toaster as the object to design so my other two objects shouldn't be toasters. I could choose a car and a grasshopper, for example, or maybe a flower and a shoe.

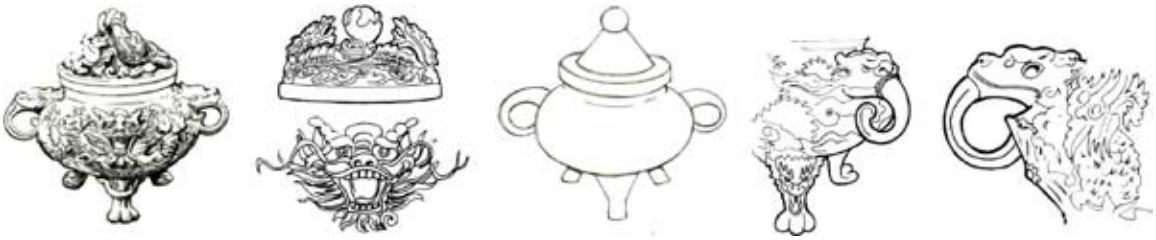
Three-dimensional objects are best because it is difficult to adapt two-dimensional art to a three dimensional form. Inspiration can come from many sources such as a period in design history, a particular artist's style, a distinctive culture, a natural object, a living creature, a consumer product, architecture, or fashion. I tell my students to choose their favorite object first. The second object, however, should be unfamiliar, even ugly, as this forces you to discover new solutions.

Step 4: Analyzing and absorbing the styling cues

Referring to the chart in step 1, the next step is to deconstruct the tangible, visual syntax or Styling Cues of each object. By doing so, you are generating visual resources to use in the next phase of the exercise. It is important to draw each of these as you find them. Drawing the object forces you to look at it more carefully. It forces you to understand its visual characteristics. By drawing the object you are uploading each of these to your mind. You are programming yourself and becoming an expert on what makes the object look unique.



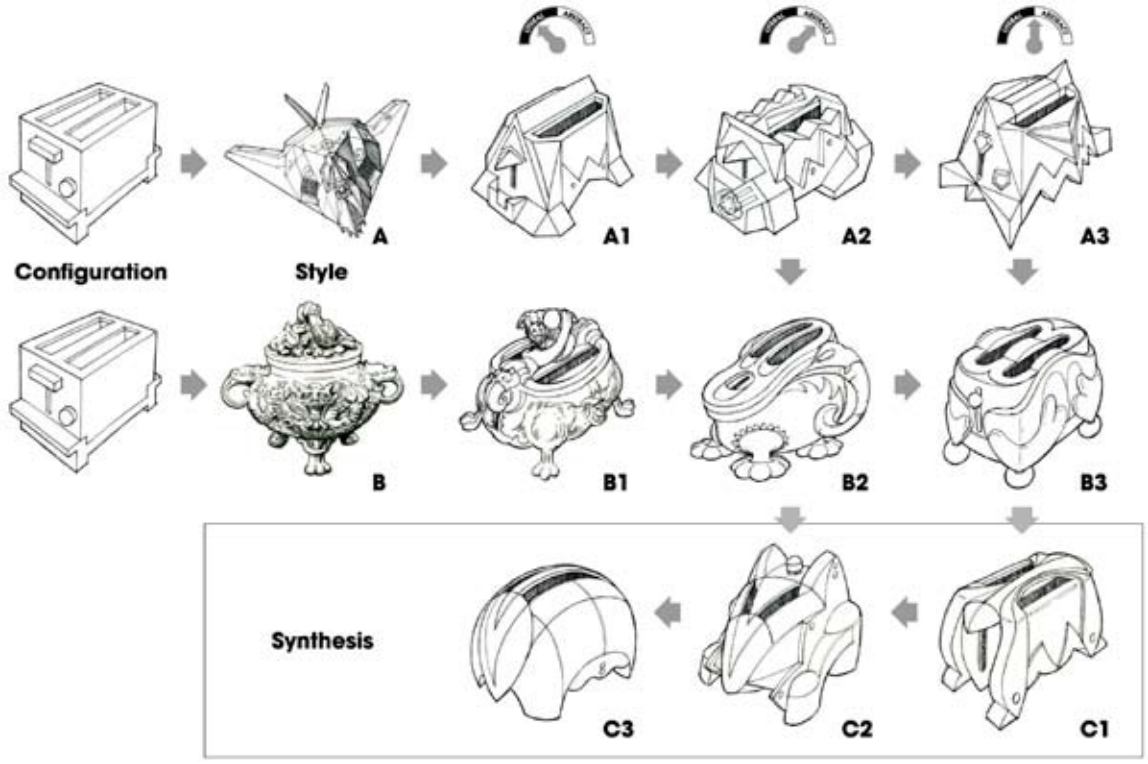
The example exercise uses an F-117 fighter aircraft as its first object. It is a very angular object on which no two surfaces meet at right angles. It is faceted like a gem and its surfaces are distinguished by its jagged, saw-tooth edges. It is aggressive and powerful, and looks like the weapon it is.



The second object is a Chinese, incense burner. It is very different from the F-117. It is highly decorative, imperfect and very low-tech. It is covered with fanciful creatures that serve no function but to amuse and stimulate the imagination. It is round and friendly.

Step 5: The Abstraction Scale

To proceed, you must now understand the Abstraction Scale and how to use it. The abstraction scale begins with a simple, literal depiction and ends with an extreme, abstract interpretation. A literal depiction looks exactly like the object with no interpretation added by the artist or designer, it is a denotation. An abstract interpretation is a connotation. When you interpret something through abstraction, you must pull it apart, discover its essence, and emphasize the unusual. Think in opposites. Things that were insignificant become significant. Things that were right side up are upside-down or inside-out. Abstraction, taken to the extreme, can leave the viewer puzzled as to what the original inspiration was.



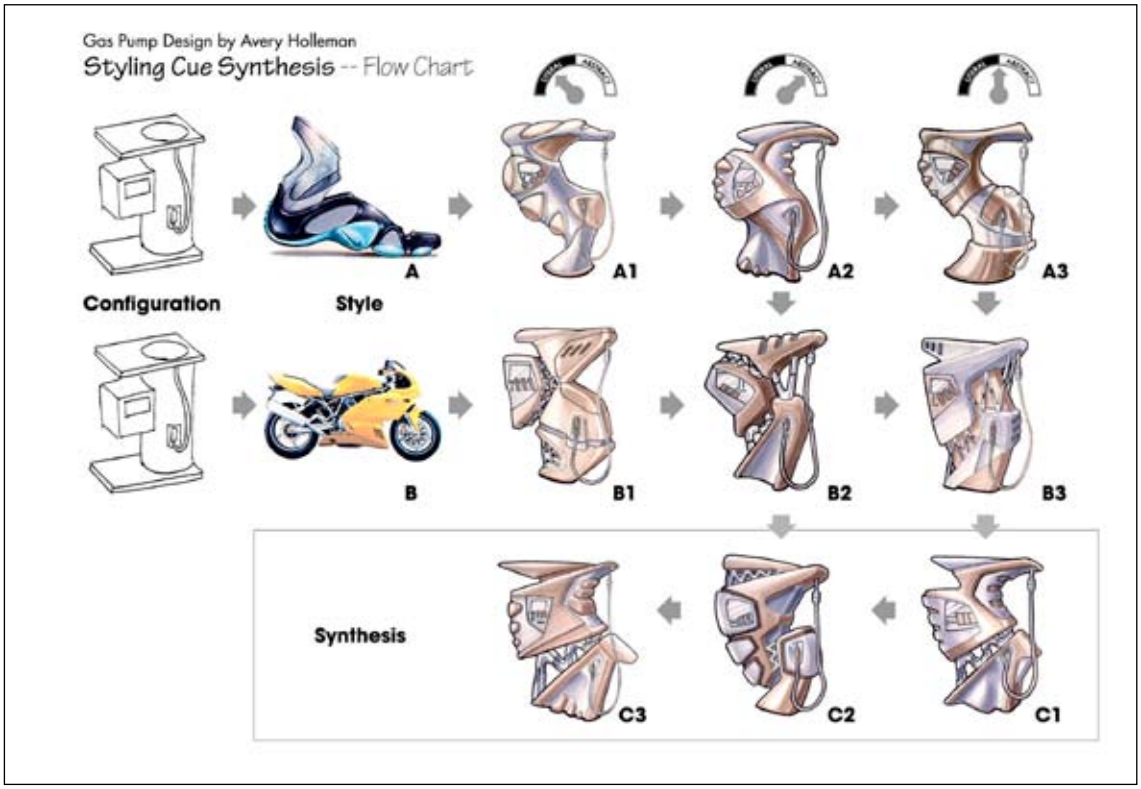
Step 6: Applying the Process
Once you have analyzed an object, begin applying its visual language to the new object you are designing. Seize the moment. You have programmed your mind and hand to understand the first set of styling cues and you must act before the energy fades. Use the diagram above for reference, and begin by overlaying the configuration drawing with a piece of tracing paper.

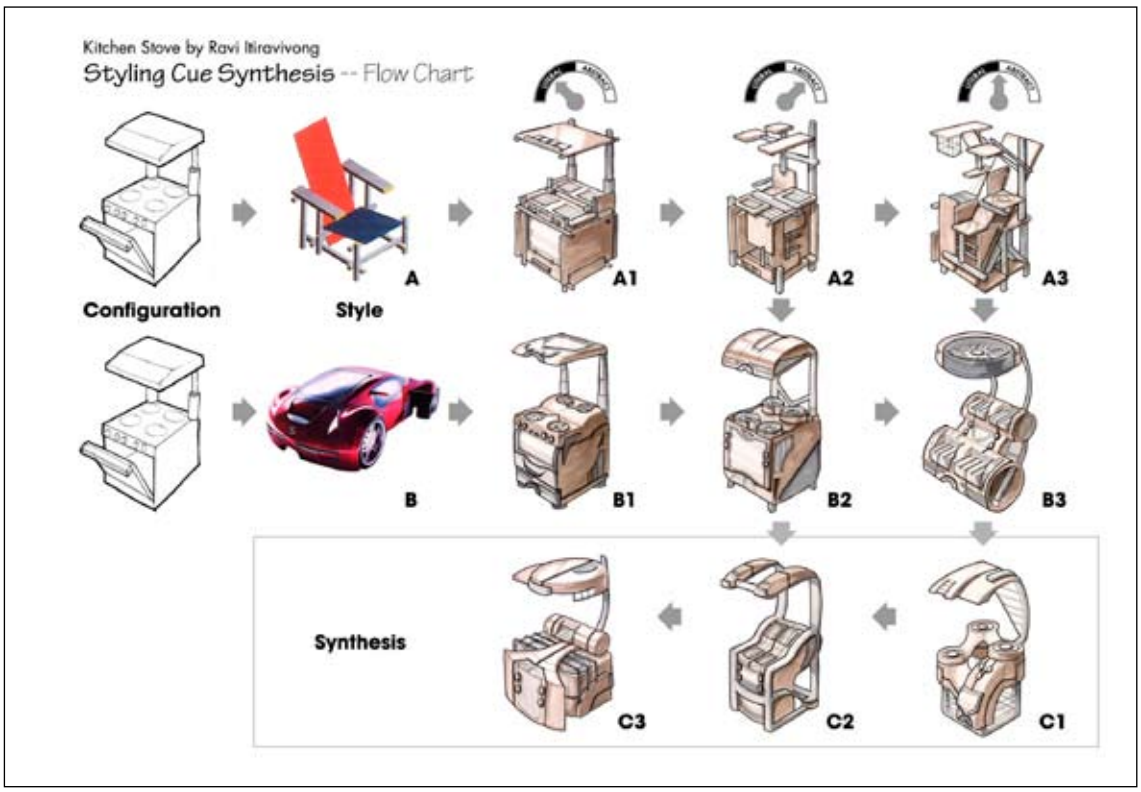
Don't panic. The first drawing (A1) is a straightforward, obvious solution. I made the toaster look like the F-117 fighter. I didn't make it look like an airplane – remember, it is a toaster. It should look like the toaster on board the airplane. If this is difficult, you either didn't study your first object enough or you are trying to be too practical. Relax, there is no right or wrong way to do this, these are only experiments that will be refined later.

Now you stretch your imagination to the limit. Apply the styling cues to the configuration drawing (A2) but this time peg the abstraction scale as far as possible. It may be ugly and dysfunctional but that's okay - you are exercising your imagination.

For your third drawing (A3) you look at the first and second drawings (A1+A2), choose what you like, what works, and then synthesize the forms into a third solution. Most likely this will be the first design that has any merit but be patient, the best is yet to come. Repeat the exercise by applying the styling cues of the second object (B1, B2, B3). Always start with the easy, obvious solution – it's a warm-up. Then draw the craziest, wackiest, thing you can think of. Then synthesize. This exercise is fun if you allow yourself to discover ideas that surprise you. When I drew the fifth toaster in the diagram (B2) I was surprised that it came out looking like a cartoon character. Then I realized that the original is all about the creatures on its surface. It was my subconscious imagination that recognized this aspect and exaggerated it to create the anthropomorphic form in the middle.

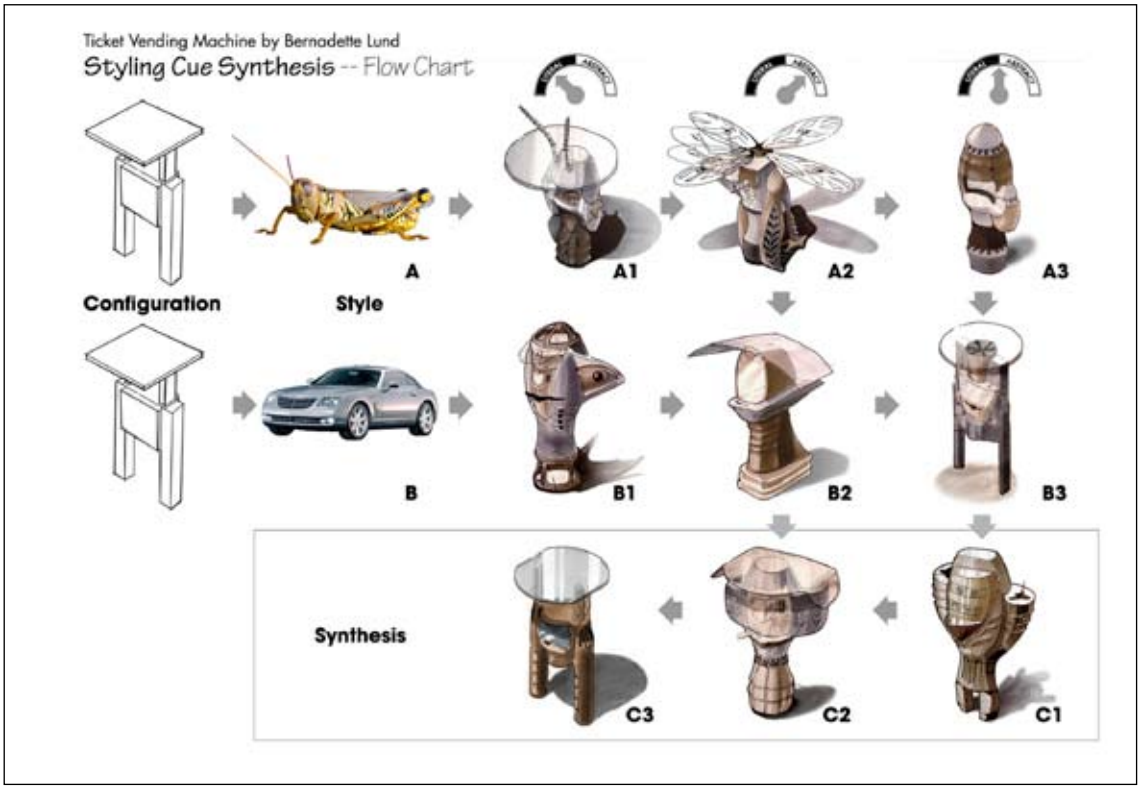
Step 7: The Final Synthesis
You may have already generated some viable solutions by interpreting the style of existing objects but they are still just adaptations. Like any, passionate designer you will find more satisfaction in creating a new look, a style all your own that does not copy something else. The final step is where true innovation lies. Begin by studying the two abstract designs from both styles (A2+B2). Borrow the best from each, shuffle them together and generate a design directly in-between. This will not be difficult if you have been concentrating and drawing without a break. Allow yourself to be surprised. Now take the two synthesis drawings from each of the two objects (A3+B3) and shuffle them together.
Finally, take the last, two synthesis drawings (C1+C2) and shuffle them together. Try to design an object that uses the very best parts of both designs. By this point, what I generated no longer looked like either the F-117 or the incense burner, yet both inspired it.

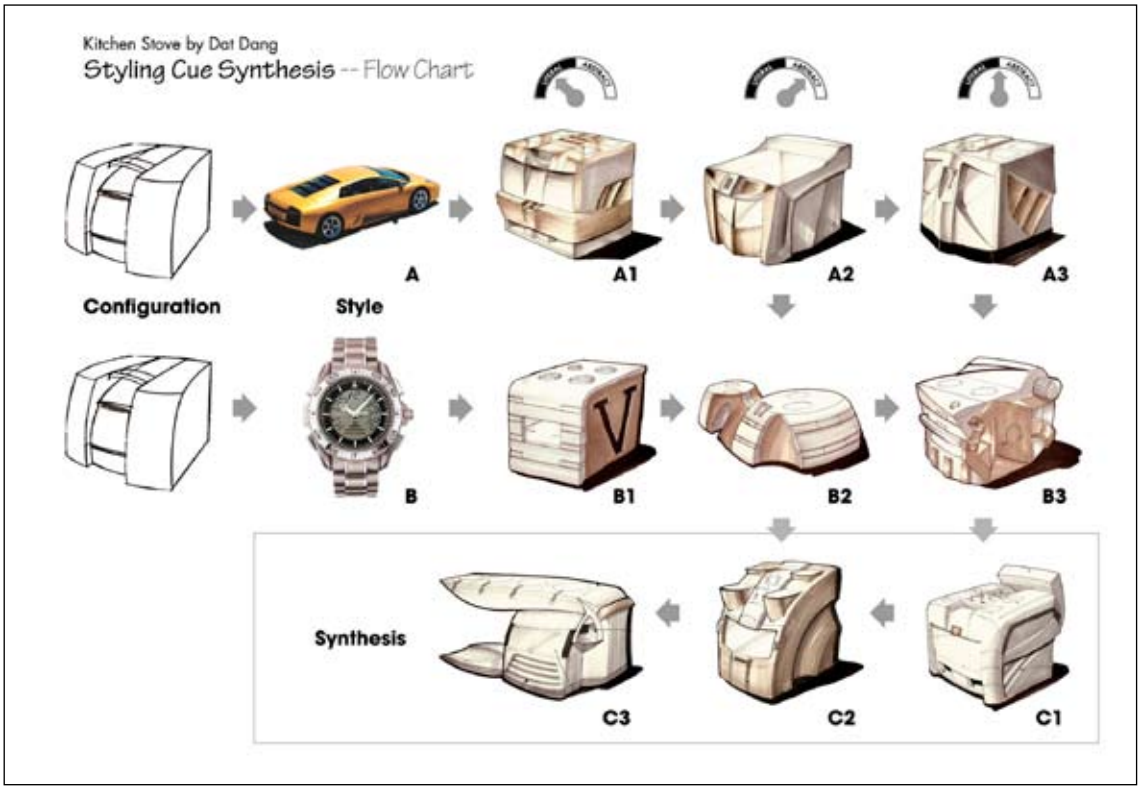


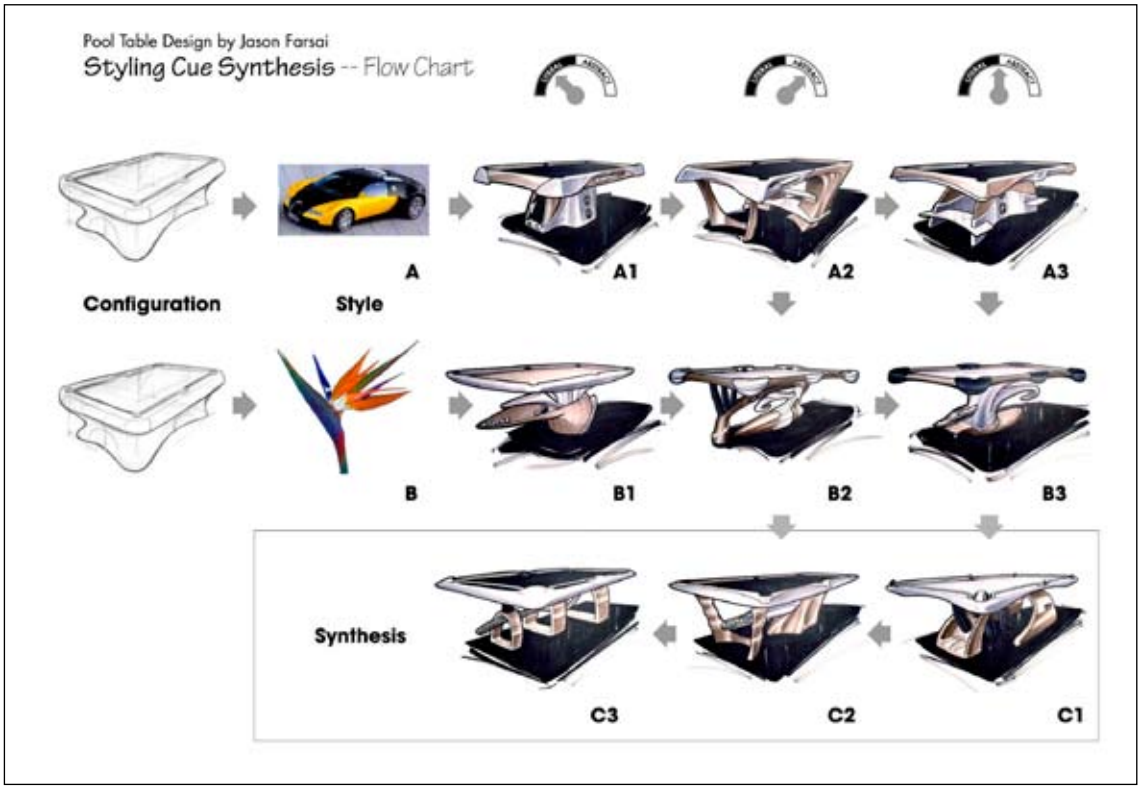


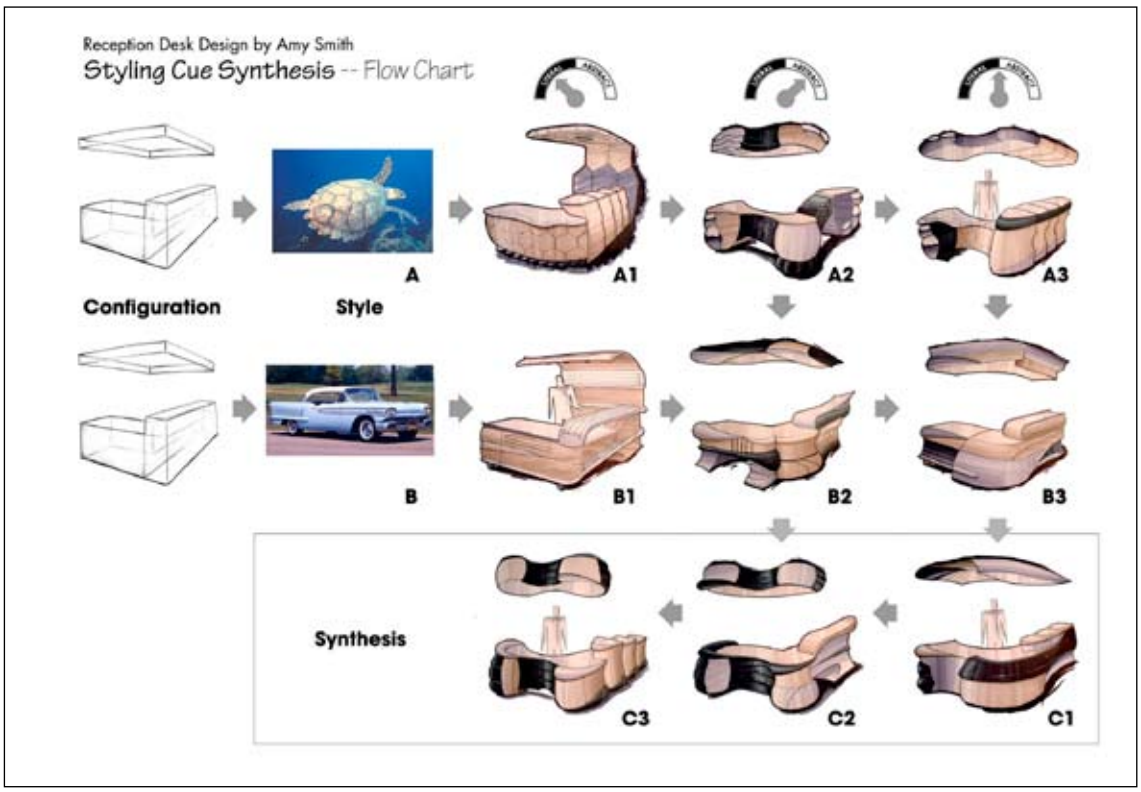
Testing the methodology

A useful form-generating methodology creates a path that leads from blank page to tangible form. Had I not had a process, I might still be staring at my paper, waiting for inspiration. Instead, I played a game that rewarded me with surprises along the way. My hand made as many decisions as my mind and instead of forcing my hand to do its bidding, my mind sat back, amused at how smart my hand could be. Best of all, I have experienced the joy of seeing this methodology work for others. I offer the following, student examples as proof of this methodology's effectiveness.


Ticket Vending Machine by Bernadette Lund
Styling Cue Synthesis -- Flow Chart
Configuration
Style
A
A1
A2
A3
B
B1
B2
B3
Synthesis
C3
C2
C1


Kitchen Stove by Dat Dang
Styling Cue Synthesis -- Flow Chart
Configuration
Style
A
A1
A2
A3
B
B1
B2
B3
Synthesis
C3
C2
C1


Pool Table Design by Jason Farsai
Styling Cue Synthesis -- Flow Chart
Configuration
Style
A
A1
A2
A3
B
B1
B2
B3
Synthesis
C3
C2
C1


Reception Desk Design by Amy Smith
Styling Cue Synthesis -- Flow Chart
Configuration
Style
A
A1
A2
A3
B
B1
B2
B3
Synthesis
C3
C2
C1

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Material codes and material narration – in design, art and architecture

Keywords
- Material Codes and Material narration in Design
- Material Mind - interdisciplinary research in design- and cultural sciences
- Hand and Language
- Social linguistic and social material behaviour – a vision of semantic form
- Interaction Design - Material works and words as cultural heritage

Material codes and material narration in design

Narrative material remembering has its own value of language for the individual and the collective heritage. This Thesis focuses neither the kind of discussion of phonetic language nor the question about the icon; first it is the material sign of the idiom, which create its own cultural code. It is not only the graphical way to express languages (fig. 1).

To analyse the cultural code for the ethnological meaning you can use the Cultural Mind, which Jan Assmann described in the 1990th for the social and historical sciences, as a fixed, strong bounded "objectivation" and ceremonial, over a long space of time remembrance like rituals of many generations.

The Cultural Mind adapted for the "Associative Material Mind" (cp. Wachs, Marina-Elena, 2008) in Design, Art and Architecture describes the way of handling with renewable materials in rituals by the group of the Shaker in the 19. Century g. e. An other example of traditional systems for handling with materials to produce artefacts since the industrialisation, is expressed in the paintings of the artist Max Liebermann: Die Weber (fig. 3) for example, describes the manufacturing of linen, which the generation of my grandma perform in growing flax, harvesting and finishing it to the woven fabric and at last for sewing wardrobe of this renewable material, called "Weißwäsche" like shirts, underclothes and other traditional clothes.

And you can recognize "individual material narration" in the "Kunstkammer treasures" like the silver cup on the right of figure 2 in comparison with a polished coconut cup, asking about the "value" of these kind of products. The answer is not only to find in the product language, which is proofed in Design during many decades with the argument of form and function. Today we know there are different expressions or semantic levels on which the artefacts can communicate ("speak") to the user. This comparable method in interdisciplinary Design focus the aim of sustainable artefacts in using materials of the planet in a responsibility way. The disciplines of Design, Art and Architecture can learn by their own history and by the history of the other discipline. Learning by the material history for the products of tomorrow is an important aspect for understanding semantic codes. The possibility of material iconographical reading is the basis to learn about the material codes from artefacts of yesterday (for tomorrow).

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

The material, corporal language finds his source in human rituals, which are based on recurrent hand-made procedure. These rituals have their beginning at the symbolised play with natural objects during the childhood (fig. 4), which forms the idea of reading abstract signs. The language and the artefacts stay in relation, like the anthropologist Michael B. Schiffer find the expression of "Correlons" in the meaning of "things – material – and human being" in his book about "material behaviour" . Neuroscientists like Elsbeth Stern and Gerhard Roth agree about the fact, of building synapses to link the linguistic -, motor function - and cognitive capabilities.

Material Mind – interdisciplinary research in design- and cultural sciences

In the new publication titled Material mind – new materials in design, art and architecture I compare the "material behaviour" in interdisciplinary ways of objects today and with look on historical grown handmade processes. Looking back to the former industrialisation and the relationship of technology and designed objects, it is evident that "Innovations must be connectable" (Helga Nowotny, 2005) with lasting things. This is also possible with the power of material objects, which create material expressions , like the artefact "missing object" from Konstantin Grcic and a piece of the "German wall". It is evident, that the value about the "German Wall" is a more historian significance of the German heritage, symbolized by a piece of stone. In this case the cultural value of the artefact "missing object" (fig. 5) is crated by the metaphorical title and the quality of material of traditional oak wood.

Hand and Language

To understand material culture we have to mediate and to decode the material signs. We have to discuss not only the iconological meaning of the form and the ornamental figures as typical product language of design. Thomas Raff described in 1991 a way of semantic and symbolic meanings of materials and the ethnologist Hans Peter Hahn wants to emphasize in this case the "Incorporation".
Hahn said in the year 2001 "also the perception of the own body change with the handling with this objects". Also Marshall McLuhan said in the 1970th that the knowledge about corporal feeling needs the consciousness about "incorporeal" feeling. , e.g. the art of Richard Serra (fig. 8) and the architecture of Daniel Libeskind. And the great socialist Richard Sennett proclaims in his actual published book "Craftsman", that your own handling with handmade objects, or

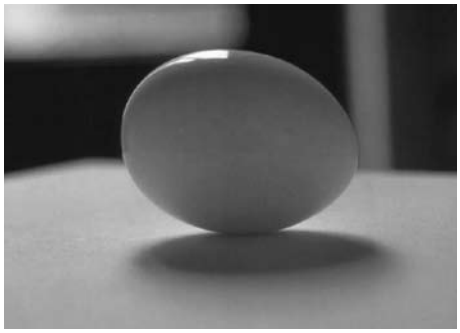

Fig. 6

Fig. 7

Fig. 8

Fig. 9

things that yourself produce with hand, forms the human being, gives him sense in a sociological way: "all manufacturing knowing in your HAND"(Richard Sennett, 2008).
It is more than the process, the form and the function of the object, it is also the esthetical expression in context of using, it is the language of surface (fig. 6, chicken´s egg, polished) and the choose of material possibilities (fig. 7) of the product, that creates sympathy or antipathy of emotional relationship and it is the material narration, approaching from the object. All these aspects are "forming" the character of semantic value of material Codes.

Social linguistic and social material behaviour – a vision of semantic form

In decoding cultural material figures there is the possibility to benefit by cultural heritage: learning from your material history, in material description or from lasting objects, can generate a "material socialisation" (Marina Wachs, 2008) like the development of social linguistic. To point the meanings of material historical cultural goods, it helps to bring them in geographical and chronological order to especial ethnological circle and social group. The archaeology, ethnology, the sciences of fine arts and most of all the iconology and the social sciences, all these disciplines try to find answers about this interpretation. Synonyms in order of material design objects and art can sketch a more three dimensional answer:

For the Art there is the example of the "Arte Povera", which uses "poor materials" and for the Interior Design, you can mention "the honesty of modern building materials …", which brings the "… language of objects" to expression, like the philosopher Jean Baudrillard proclaimed in the 1960th.
There are other material expressions which forces the codes of objects to a new cultural language – e.g. material narration like the porcelain "touch!" (Khala) and metamorphose material signs like fashion design of >Comme des garçon< in the 90th and a fashion seminar of the Hamburg University of Applied Sciences, Department Design from 2008 (fig. 8). The poetical expression of the scenario - material made - shows the power of seduction of materiality, even in the absence of material and in scenarios created by "immateriality". "You can perceive the >material speech< in the materialise trace, which depends on a kind of syntax and system of signs to decode with. In relation to the >Power of Words< you can give the material codes today a great potential of communicative force."

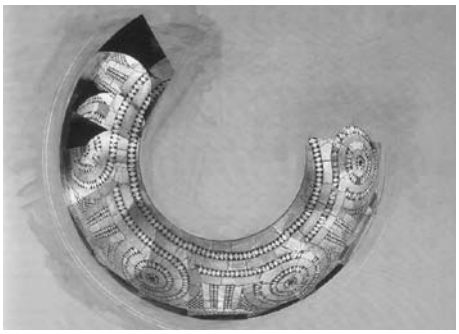

Fig. 10

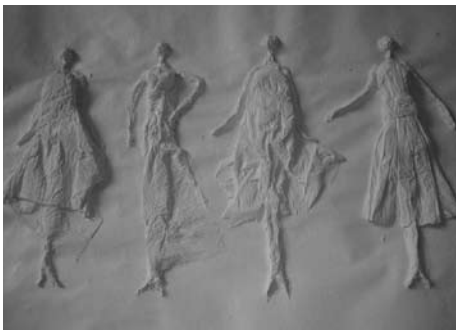

Fig. 11

Material works and words as cultural heritage

The "readability" of material codes depends on knowing about significance of language. Kirsten Adamzik says, "Different are not the cognitive abilities (to see similarities), but only the structures of language of world." This conclusion refers to the "Valeur" by Ferdinand des Saussures, that the system is bounded to linguistic characters.
To take profit from this linguistic insight we have to transfer the meanings of codes into the product language of Design. To transfer the idiom codes in the material iconological reading of material cultural goods is the possibility to learn for further material figures. Intercultural understanding depends on the capability to understand artefacts of a more "globalize" product market. The process for manufacturing objects is getting more and more abstract and unknown to the user, there is less possible plateaus for identification. But to emphasize the cultural heritage in material things is the way to adopt world like it is and not like behind.
Material words and material codes had to distinguish the expression of "language", which include the phonetic-, the graphologic-, the acoustic and the tactile language of artefacts.

So lets create more interdisciplinary languages of Design, Art, Architecture, Theatre, Music of poetic codes (fig. 10 +11).
Sometimes product languages today depends more on the material and surface than the form. Both, material and form speak to the user in more or less functional, poetical, ergonomic or economical way. But the quality of individual semantic meaning depends on the possibility of handling and touching the cultural – worthy being remembered – good of design, art and architecture. "thinking about material is touching material – and being touched by materialnarration…"

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Figures

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02: „ twosome“, Maike Dahl, 2003, coconut polished and 925er silver, for Exposition: Gold, Kokosnuss und Edelsthal – Kunstkammerschätze gestern und heute, Kestnermuseum Hannover.
03: Die Weber, from artist: Max Liebermann, 1882, oil on canvas, “Landesmuseum Hannover”, Germany.
04: Hand of a child is gripping sand, 2003, Foto: Marina-E. Wachs, Germany.
05: missing object, Konstantin Grcic, 2004, oak wood, 40 cm high x 50 cm long x 25 cm thick, for exposition in Kreo Galerie, Paris, 2004, vgl. Böhm, Florian, 2005 KGID, Konstantin Grcic Industrial Design, S. 123.
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Yung-Chin Tsao, Shang-Feng Yang

Image cognition and preference study pertinent to interactive design of public art

Abstract

In recent years, thanks to the joint effort of the government and the private sector, creation, design and establishment of public art in Taiwan has experienced solid development. Progress in information technology opens people's eyes to the significance of interactive design. Appreciation of the concept of interactive design and application of technologies also give public art diverse expressions.

This study selects public artworks of Taipei Metro stations as survey samples. Utilizing image analysis, and in accordance with interaction intimacy and rendering style, it divides human-artwork interaction of public arts into three categories – visual interaction, bodily interaction and behavior-sensing interaction. It also explore viewers' image cognition and preference factors pertinent to the interactive design of the three types of public arts.

This study employs the survey investigation method and the interview method. The interview method is used to investigate 30 respondents' image cognition and degree of preference. In the final step, the data collected is analyzed and examined via the quantitative software SPSS. The interview method is utilized for interview with writers and experts and for qualitative analysis. It is the author's earnest expectation that findings of this study can serve as reference for creation and design of public art in the future and for academic research.

Keywords:

public art, interactive design, image cognition, preference study

1. Introduction

Thanks to the joint effort of the government and the private sector, Taiwan's public art has experienced significant development in the last few years. The public artworks of Taipei, the capital of Taiwan, are typically noteworthy in terms of budgetary resources invested by government agencies, the number of establishments, and the richness of rendering. From Taipei City's performance in the design of public arts, we have a glimpse of the overall evolvement.

In recent years, the rendering methods employed in interactive design of public artworks have expanded from visual interaction to interactive design that involves bodily contact and physical space, as well as one that incorporates behavioral and digital sensing devices. This enriches the rendering of public art and enhances interactive sensations between humans and artworks. Especially noteworthy is the fact that the number of public arts with special digital audio-video effects and high-tech sensing is increasing. Yet works focusing on the surprises and freshness brought about by new materials and technologies often distract people from the artistic essence, aesthetic depth and humanistic context of art. The researcher believes it is an issue that is worth our attention.

This study does not question the contribution of new media, technologies and digital devices in enriching the representation of public arts. Rather, it offers a space for public art designers to rethink.
The purpose of this study is

1. Explore whether in terms of man-artwork interaction it is appropriate for this study to divide the interactive design of public arts into three categories – visual interaction, bodily interaction and behavior-sensing interaction.
2. Explore distribution of each category on the major ingredient image analysis coordinate and understand viewers' perception of the image of different interactive design categories.
3. Explore primary factors underlying interactive public artworks that viewers consider "like" and "appealing".

2. Literature Review

2-1. Diverse Public Arts

Encompassing artistic nature and public affairs, public art is an active way of participation in public space environment. Incorporating the characteristics and relations of "people," "work" and "environment," it is an interactive art and design that is in intimate contact with the general public. This study is limited to exploration of the image of interaction between "people" and "work."
Through its rendering style, public art constructs a field situation to convey the author's thought and experience. Introduction of various artistic renderings, such as landscape art, environmental art, installation art and technology art, with different types of forms and concepts, diversifies the representations of public art and affects the way people interact with artworks. Introduced to Taiwan in the 80's and becoming the mainstream in the 90's, installation art (Sun, 2003) influences public art in theme, spatial structure and field layout. Stemming up in the 90's, digital art (Wu , 2003) for its use of high-tech media and digital equipment gives multiple redound to the interaction and sensing of public art.
Public art follows three principles: artistic nature, landscape value and amicability (Guo, 1993). A public artwork should have an "artistic nature" that is vested with aesthetic context and humanistic depth, a "landscape value" that mingles environmental elements and gives meaning to the place, an "amicability" that allows people to draw near for interaction. This way, it through the five physical senses (visual, auditory, olfactory, taste and tactile) sets off humanistic thinking and perception in the minds of viewers from different experiences and backgrounds. Such an interaction can enrich human-human and human-work communications, deepen viewers' concern over public art and trigger educational exploration.

2-2. Aesthetics of Interaction

"Interaction" is a behavior through which human beings communicate with, explore and learn the outside world. It is in human nature; it is also a way of life. Human activities in the public space can be largely divided into three categories (Jan, 1986): "necessary activity," "optional activity" and "social activity." The construction and progress of these activities give the environment its field meaning.
Linkages between activities become various components affecting the interaction (Shih, 2001). There are many factors that influence interaction with public art: "human factors" such as the creator and the viewers; "environmental factors" such as natural landscape, artificial environment, local custom and history; "artistic factor of the work" such as shape, color, theme and openness and function of the spatial structure. Increasing interaction components and contact opportunities makes interactive behavior easier and deepens the context and motive of interaction.
There are two types of interaction (Yeh, 2003). The one is "visual/mental interaction" that takes place quietly between the objects; the other is "bodily/physical interaction" that involves physical behavior. Through participation in and contact with interactive public art, viewers have aesthetic experience and mental perception – "interactive aesthetics."
"Interactive aesthetics" involves perceptual-motor skills that employ the physical senses to perceive things done between the body and the artwork, as well as emotional skills by which users undergo the life experience and sensation brought about by interactive products (Ou, 2003). Physical sensation of interactive design and behavior generates rich aesthetic experiences in association with mental perception. This is the start point from which public art promotes human-human and human-work communication via the concept of interactive design.

3. Research and survey analysis

3-1. Collection of interactive public artworks

For its experiment this study selects 22 public artworks of Taipei Metro stations. Three additional works – "The Hands Suite" of National Taiwan University Hospital Station, "Blessedness Knows" of Xiaobitan Station and "Growth" of Taipei City Hall Station – are street furniture works noted for their integration of practical and artistic purposes. They are therefore chosen and added to the 22 works to form a 25-piece test group (Figure3) for the research and experiment.

3-2. Collection and classification of public art descriptive words

To collect public art descriptive words, the researcher interviews nine individuals associated with art design, who to certain extent understand the nature of public arts, including art exhibition planners, art designers, and art and sculpture education workers. Through the interview 86 terms describing visual sensations and 64 terms related to perception of interaction with the works are gathered. The 150 expressions are put through the first integration and screening session. With other literatures referenced and subjective/ objective conditions evaluated, 28 pairs of comparative descriptive words are selected for pretest and group discussion. The result undergoes the second integration and screening session, which results in 18 pairs of comparative descriptive words. With the addition of the generation comments – "like-dislike" and "appealing-unappealing" – there are 20 word pairs plus seven stages of semantic differential (SD) for ensuing surveys.

1. modern–traditional	2. intriguing–ordinary	3. outgoing–taciturn
4. pleasant–anxious	5. amicable–aloof	6. space invigorating – space dulling
7. long-lastingly eye-catching – transiently eye-catching	8. solid–frail	9. diversified–monotone
10. profound-superficial	11. profoundly artistic –superficially artistic	12. natural and humane – technological and mechanical
13. emotional interaction – rational interaction	14. dynamic, mobile – static, thoughtful	15. spontaneous reaction – unhurried appreciation
16. participation – sense of detachment	17. for practical purpose – for viewing	18. open –closed
19. like –dislike	20. appealing –unappealing	

Table 1 Adjective terms

3-4 . Public artworks image test

3-4-1. Respondent analysis

There are 30 respondents in this study, of whom 22 come from art design background and 8 from other backgrounds; 22 are males and 8 are females.

3-4-2. Survey method

In this study the respondents are given ample time to experience the shape and spatial relations of the 25 samples. Objective explanations are given to help the respondents understand the theme and materials of the samples before they answer the descriptive word survey questionnaires. In accordance with their perception and feeling generated during their interaction with the artwork, the respondents go through seven stages of semantic evaluation, assessing the extent to which the artwork matches the descriptive words.

3-5. Image survey outcome analysis

3-5 -1 .Image structure analysis

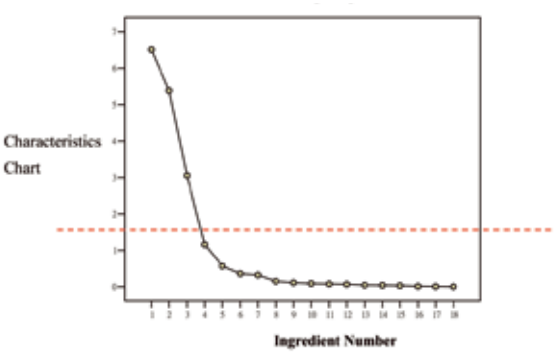


Figure 1 Steep slope chart

To explore the primary factors that make up the interactive design image structure of public arts, outcomes of the image test are put through the major ingredient analysis. Due to the fact that the accumulated explanation ratio of the three major ingredients reaches 83.031% and that the characteristic values are all above 1, major ingredients 1 thru 3 are chosen for analysis. Outcomes of the analysis are shown in the following table.

The first primary ingredient consists of typical images including "outgoing-taciturn," "intriguing-ordinary," "modern-traditional," "pleasant-anxious" and "dynamic, mobile – static, thoughtful" because the scores of the first three items are high and they are all used to describe atmosphere shaping by the work. They can therefore be interpreted as the "Outward Ambience" factor of "outgoing-taciturn."

	No.	Descriptive Word Pair	Major Ingredient 1	2	3
Atmosphere of the Work: **Outward Ambience Axis (outgoing-taciturn)**	3	outgoing-taciturn	.947	.100	-.063
	2	intriguing-ordinary	.909	-.121	-.041
	1	modern-traditional	.871	-.122	-.133
	4	pleasant-anxious	.821	.295	.140
	14	dynamic, mobile – static, thoughtful	.768	.377	-.386
	15	spontaneous reaction – unhurried appreciation	.689	.482	-.497
	6	space invigorating – space dulling	.625	.615	.221
Body-Work Contact and Connection **Spatial Interaction Axis (involving—distant)**	5	amicable-aloof	.090	.943	.151
	16	sense of participation – sense of detachment	.140	.893	-.010
	18	space of work is open- space of work is closed	.247	.871	.209
	17	for practical purpose – for viewing	-.067	.863	-.268
	8	solid-frail	-.540	.701	.202
Artistic Rendering: **Contextual Expression Axis (richly artistic –lightly artistic)**	11	profoundly artistic –superficially artistic	-.037	-.002	.956
	7	long-lastingly eye-catching – transiently eye-catching	-.082	.419	.750
	10	profound-superficial	-.348	-.252	.750
	13	emotional interaction – rational interaction	-.057	.570	.710
	9	diversified-monotone	.502	-.077	.685
	12	natural and humane – technological and mechanical	-.555	.282	.602
Characteristic Value			5.693	5.211	4.042
Explanation Ratio (%)			31.628	28.950	22.454
Accumulated Explanation Ratio (%)			31.628	60.578	**83.031**

Table 2 Major ingredient analysis

The second primary ingredient comprises typical images including "amicable-aloof," "sense of participation – sense of detachment," "space of work is open- space of work is closed" and "for practical purpose – for viewing." The scores of the first three items are high and they are all used to describe the contact, interaction and connection between the body and the work. They can therefore be interpreted as the "spatial interaction" factor of "involving-distant."

The third primary ingredient is made up of typical images including "profoundly artistic –superficially artistic," "long-lastingly eye-catching – transiently eye-catching" and "profound-superficial." The scores of these three items are high and they are all about the artistic expression of the work. They can therefore be interpreted as the "contextual expression" factor of "richly artistic –lightly artistic."

3-5-2. Cluster analysis and corresponding relations of image main ingredient factor axis

To pinpoint corresponding relations between various types of interactive public artworks and image factor axis, the points identified from major ingredient analysis are spread along each major ingredient axis to form an image space. In conjunction with the result of cluster analysis, the relationship of the sample and the interactive design image of public artworks are observed. The major ingredient points are analyzed via Ward's Minimum Variance Method.

The characteristics of the four groups of interactive public artworks are as follows: From the outcome of the cluster analysis, we can divide the interaction of the work and people into "G1 Behavior-sensing interaction", "G2 Bodily-contact practical interaction", "G3 Bodily spatial involvement interaction." and "G4 Visual interaction".

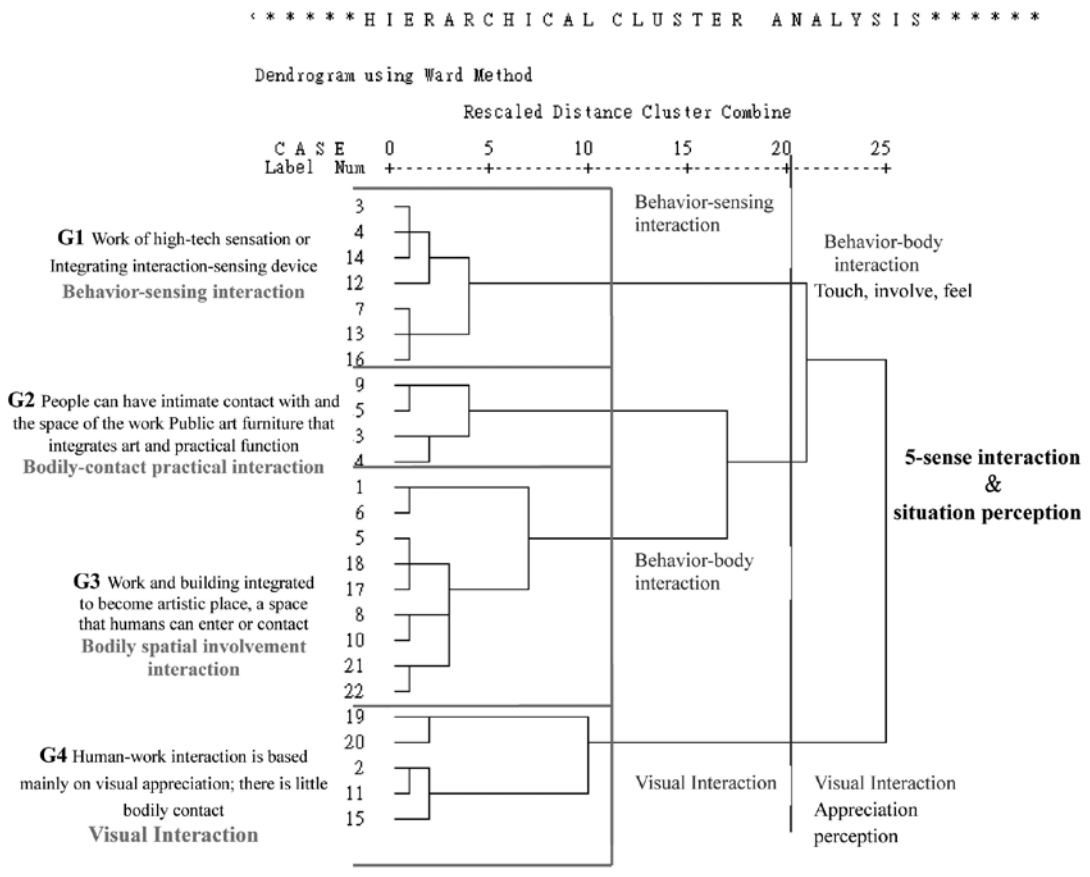
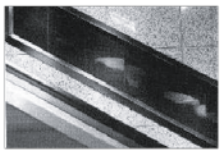
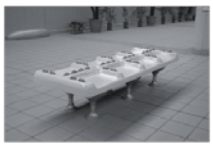


Figure 2 Cluster analysis outcomes, in 4 groups

G1 Behavior-sensing interaction				
				
Sample 3	Sample 4	Sample 14	Sample 12	Sample 7
				
Sample 13	Sample 16			

G2 Bodily-contact practical interaction				
				
Sample 9	Sample 25	Sample 23	Sample 24	

G3 Bodily spatial involvement interaction				
				
Sample 1	Sample 6	Sample 5	Sample 18	Sample 17
				
Sample 8	Sample 10	Sample 21	Sample 22	

G4 G4 Visual interaction				
				
Sample 19	Sample 20	Sample 2	Sample 11	Sample 15

Figure3 Analysis of Characteristics of 4 Groups of Works

3-5-3. Analysis of characteristics of 4 groups of works

In accordance with human-work interaction characteristics of the four groups of public arts we can reasonably argue that:

G1Behavior-sensing interaction

There are 7 pieces of works in G1 for cluster analysis (Figure 2). As a whole the works of this group demonstrate two characteristics: high-tech device and sensing-interaction. In terms of design, and material/ technology utilization, this group shows images, lights, LCD, digital communication and sensing that are frequently seen in installation arts and digital arts in recent years. Sensing and interaction methods are more closely associated with human behavior.

In the analysis of Figure 4 and Figure 5 we can see that G1 is closer to the "outgoing" image on the Outward Ambience Axis, and closer to the "aloof" and "superficially artistic" on the "interaction axis" and "contextual expression axis" respectively. Sample 7 is more "amicable" than other samples in G1 while sample 13 is most "aloof," most in line with the design and structural status of the artwork. G1 as a whole gives viewers the image of outgoing and intriguing, yet both features are considered lightly artistic, which can be interpreted as an indication that viewers' perception of the lightness or profoundness of the artistic sensation is not unilaterally dependent on the presence of intriguing high-tech devices.

G2 Bodily-contact practical interaction

There are 4 pieces of works in G2 for cluster analysis (Figure 2). As a whole the works of this group exemplify integration of artistic and functional characteristics. They are works that viewers can draw near, touch and use. All the works are public arts of special forms. Especially noteworthy are samples 23 and 24, whose shapes and structures give people the impression of open space that invite their "participation" and give them the desire for "intimate encounter."

In the analysis of Figure 4 and Figure 5 we can see that G2 is closer to the "reserved" image on the Outward Ambience Axis, and closer to the "amicable" and "superficially artistic" on the "interaction axis" and the "contextual expression axis" respectively because as a whole the group is more function-oriented. Sample 23, however, is a more artistic work.

G3 Bodily spatial involvement interaction

There are 9 pieces of works in G3 (Figure 2). Overall speaking, the samples in this group display incorporation of the artwork and building into an artistic space that viewer can approach and touch, an open space that viewers can involve their bodies for participation. G3 is similar to G2. Yet the spaces of G3 works expand with the extension of the building to show their expansiveness.

In the analysis of Figure 4 and Figure 5 we can see that G3 is closer to the "outgoing" image on the Outward Ambience Axis, and closer to the "amicable" and "profoundly artistic" on the "interaction axis" and "contextual expression axis" respectively. Both G3 and G1 are quite outgoing. But the context of G3 is more saturated with artistic images.

G4 Visual interaction

There are 4 pieces of works in G4 (Figure 2). As a whole, human-work interaction of the works in this group is mainly for visual appreciation. Due to the fact that the space of the work is independent and enclosed, viewers' bodily contact with and participation in the work is less likely.

In the analysis of Figure 4 and Figure 5 we can see that G4 is closer to the "taciturn" image on the Outward Ambience Axis, and closer to the "aloof" on the "interaction axis." On the "contextual expression axis" the dots are evenly distributed. The themes of sample 19 and 20 display memories of historical artifacts and images that are superficially artistic. Meanwhile, the renderings of samples 19 and 20 show images that are profoundly artistic.

Image Space

Figure 4 image space scattering of interactive public arts (1st & 2nd major ingredients)

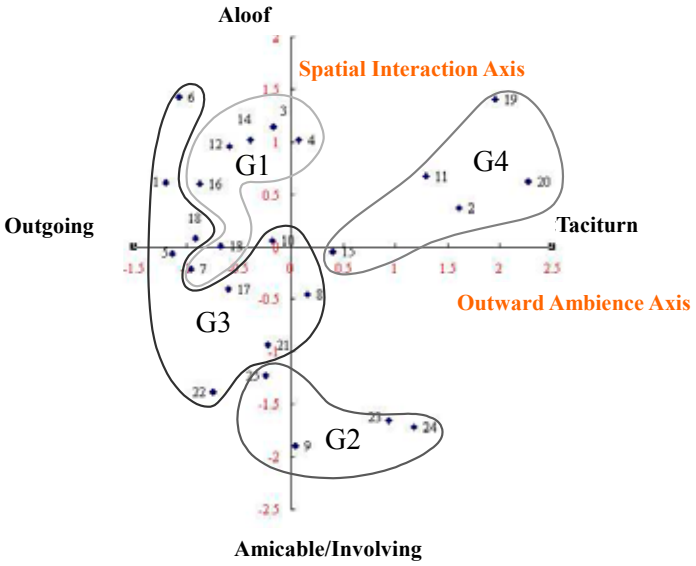
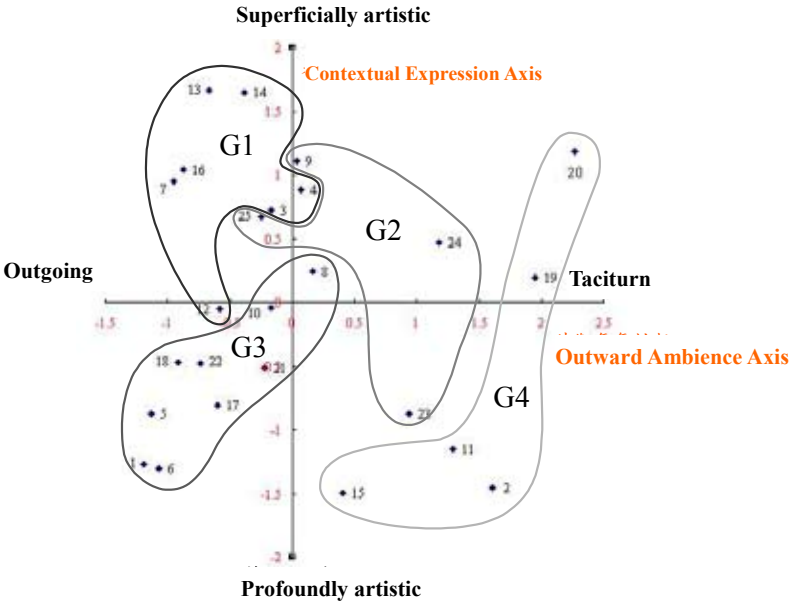


Figure5 Image space scattering of interactive public arts (1st & 3rd major ingredients)

4.Comment



4-1. Causation of "like" rating and image of interactive public artwork

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.849	.401		2.116	.045
	long-lastingly eye-catching–transiently eye-catching	.669	.124	.747	5.382	.000
2	(Constant)	-.444	.403		-1.101	.283
	long-lastingly eye-catching–transiently eye-catching	.775	.093	.864	8.318	.000
	spontaneous reaction – unhurried appreciation	.255	.055	.483	4.645	.000

Dependent Variable: Like

Table 3 "Like" Coefficients(Regression Analysis)

Model	R	Rsquare	Adjusted R square	standard error of estimate
1	.747(a)	.557	.538	.33979
2	.881(b)	.777	.756	.24686

Table 4 Model Summary

a Predictor: (constant), "long-lastingly eye-catching–transiently eye-catching"

b Predictor: (constant), "long-lastingly eye-catching–transiently eye-catching," "spontaneous reaction – unhurried appreciation"

To dissect the cause-effect relationship of "like" rating and image of interactive public artwork, this study in this stage employs "like-dislike" as the dependent variable and other image description words as independent variables for regression analysis. The outcomes are shown in Table 3. Analysis results indicate the significance of "long-lastingly eye-catching" and "unhurried appreciation" is less than 0.005. Therefore we can explain that the two are independent variables that generate the "like" sensation. So "long-lastingly eye-catching" and "unhurried appreciation" images

affect the types of public arts that respondents "like." Accordingly, this study further interprets "long-lastingly eye-catching" as "beautiful and long-lastingly eye-catching," and "unhurried appreciation" as "profound."

Its regression equation is:

Pre-standardization regression equation is:

Like=-0.444+0.775×"beautiful and long-lastingly eye-catching"+0.255× "profound"

Post-standardization regression equation is:

Like=0.864×"beautiful and long-lastingly eye-catching"+0.483×"profound"

Then we observe the Model Summary Table (see Table 4). The adjusted R square coefficient of Model 2 is 0.756, which is greater than 0.5. So its goodness-of-fit is acceptable.

4-2. Causation of "appealing" rating and image of interactive public artwork

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.638	.389		1.638	.115
	long-lastingly eye-catching– transiently eye-catching	.733	.121	.785	6.078	.000
2	(Constant)	-.488	.397		-1.230	.232
	long-lastingly eye catching– transiently eye-catching	.739	.092	.850	8.575	.000
	dynamic, mobile – static, thoughtful	.227	.054	.421	4.248	.000

Dependent Variable: appealing

Table 5 "Appealing" Coefficients(Regression Analysis)

Model	R	Rsquare	Adjusted R square	standard error of estimate
1	.785(a)	.616	.600	.32948
2	.888(b)	.789	.770	.24971

Table 6 Model Summary

a Predictor: (constant), "long-lastingly eye-catching – transiently eye-catching"

b Predictor: (constant), "long-lastingly eye-catching – transiently eye-catching," "dynamic, mobile – static, thoughtful"

To understand the cause-effect relationship of "appealing" rating and image of interactive public artwork, this study in this stage employs "appealing-unappealing" as the dependent variable and other image description words as independent variables for regression analysis. The outcomes are shown in Table 5. Analysis results indicate the significance of "long-lastingly eye-catching" and "dynamic, mobile – static, thoughtful" is less than 0.005. Therefore we can explain that the two are independent variables that generate the "appealing" sensation. So "long-lastingly eye-catching" and "static, thoughtful" images affect the types of public arts that respondents "like." Accordingly, this study further interprets "long-lastingly eye-catching" as "beautiful and long-lastingly eye-catching," and "static, thoughtful" as "though-interactive."

Its regression equation is:

Pre-standardization regression equation is:

Like=-0.488+0.793×"beautiful and long-lastingly eye-catching"+0.227× "though-interactive"

Post-standardization regression equation is:

Like=0.850×"beautiful and long-lastingly eye-catching"+0.421×"though-interactive"

Then we observe the Model Summary Table (see Table 6). The adjusted R square coefficient of Model 2 is 0.770, which is greater than 0.5. So its goodness-of-fit is acceptable.

5. Conclusion and reasoning

(1) From the outcome of the cluster analysis (Figure 2), we understand that human-work interaction can be divided into four clusters: "G1 Behavior-sensing interaction," "G2 Bodily-contact practical interaction," "G3 Bodily spatial involvement interaction" and "G4 Visual interaction." Since G2 and G3 share common features in bodily interaction, they can be grouped together as "bodily intimacy interaction" for discussion. Such an outcome is in line with the assumption of this study.

(2) Based on the major ingredient image space analysis (Figure 4, Figure 5), we understand: G1Behavior-sensing interaction is more inclined to the image perception of "outgoing," "aloof" and superficially artistic."

G2 Bodily-contact practical interaction is more inclined

to the image perception of "taciturn," "amicable/involving" and superficially artistic."

G3Bodily spatial involvement interaction is more inclined to the image perception of "outgoing," "amicable/involving" and profoundly artistic."
G4 Visual interaction is more inclined to the image perception of "taciturn," "aloof" and profoundly artistic."

(3) From the outcome of the linear regression analysis (Table 3, Table 5), we understand that "long-lastingly eye-catching" and "profound" are primary factors underlying "like," while "long-lastingly eye-catching" and "interactive" are primary factors underlying "appealing." Therefore we can say "long-lastingly eye-catching, profound and interactive" are key players affecting viewers' preference for public arts.
(4) It is true that digital technology and utilization of various materials have enriched the rendering of public arts and enhanced possibilities of human-artwork interaction. No matter what the rendering approach and what the interactive design are, evaluation of public artworks shall be based on the aesthetic essence of the design, not merely on the surprising interactive effects made possible by digital technology and audio-video sensing.

The experiment in this study has left much room for improvement. The researcher is not in the position to second guess the image perspectives of the general public from an experiment of limited scope. Yet it is an important issue to rethink the quality of the interactive design of public arts according to the humanistic essence of art design. Based on the foundation of this study, the researcher will improve the research method, expand the scope of the exploration and delve deep into the essence of the interactive design of public arts in order to seek an opportunity for rethinking and further achievement in the next phase.

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Tom Djajadiningrat, Luc Geurts, Geert Christiaansen and Steven Kyffin

Mindspheres
Play your skills, relax your mind

Abstract

This device, consisting of two MindSpheres and a charging dock, helps the user to relax in a playful manner. The user can interact with the MindSpheres by making them orbit each other in the palm of the hand. The aim when playing with MindSpheres is to twirl them as smoothly as possible. Focusing on this skilled task provides a playful diversion which helps the user to relax mentally. At the same time, achieving such smooth hand movements is only possible when the mind is in a state of relaxed contemplation: it is not until the mind becomes quiet that the movements start to flow. Being nervous or overly concentrated is typically counterproductive when trying to make this kind of subtle movement.

While twirling, the user's movements are detected and analysed by MindSpheres in real-time. Changes in the smoothness of movement cause changes in the light and vibration feedback pattern of each MindSphere. At first, when the user's movements are jerky and incoherent, the feedback is random. Yet the smoother the user twirls the MindSpheres and the longer the user manages to sustain this smoothness, the more structured, restful, beautiful and mesmerising the feedback patterns become.

We see MindSpheres as a concept which takes a holistic approach to relaxation. Instead of treating physical and mental relaxation as separate phenomena it builds upon the very relationship between body and mind.

Introduction

Increasingly busy lifestyles have triggered a surge of interest in devices aimed at mental well-being. Most of these devices are based upon physiological measures such as heart rate, blood pressure and galvanic skin response. Since these measurements are easily disturbed by movement, the user must sit as still as possible, leading to a potential conflict between a cramped posture and the desire to relax.

MindSpheres is the result of a more free and playful approach to relaxation. It builds upon the idea that building fine motor skills through dexterous exercises is both a relaxing and a rewarding experience. Rather than making use of physiological measures and forcing the user to sit still, MindSpheres encourages users to enter a state of relaxed contemplation by making them focus on a challenging, playful task: twirling around the MindSpheres.

Reasons to Believe: Bridging the mind-body divide

From a classical scientific point of view, in which mind and body are seen as fundamentally distinct, MindSpheres simply offers users an enjoyable way to hone their perceptual-motor skills and thereby exercise parts of their nervous system which receive little use in everyday life. In this 'disembodied' view of intelligence and action, the superior mind is the agency

which puts the inferior body to work [1]. However, there is a growing family of responses to this cognitivist conception of mind which question the Cartesian mind-body split. These approaches share a realisation that the body is not merely a tool for our use in accomplishing our purposes, but that instead there is an interplay between our state of mind and how we bodily engage with the world [2].

For example, in the concept of 'mindfulness' [3] it is said that by concentrating on the moment, on basic everyday actions in the 'here and now', users may learn to accept and re-interpret the stressful 'chatter' of the mind into a positive experience. Bringing the mind to focus on what is happening in the present moment, while simply noticing the mind's usual 'commentary', may help relieve stress and induce relaxation. Mindfulness is undergoing clinical trials in the form of the Mindfulness-Based Stress Reduction (MBSR) program [4], a form of complementary medicine offered in over 200 U.S. hospitals.

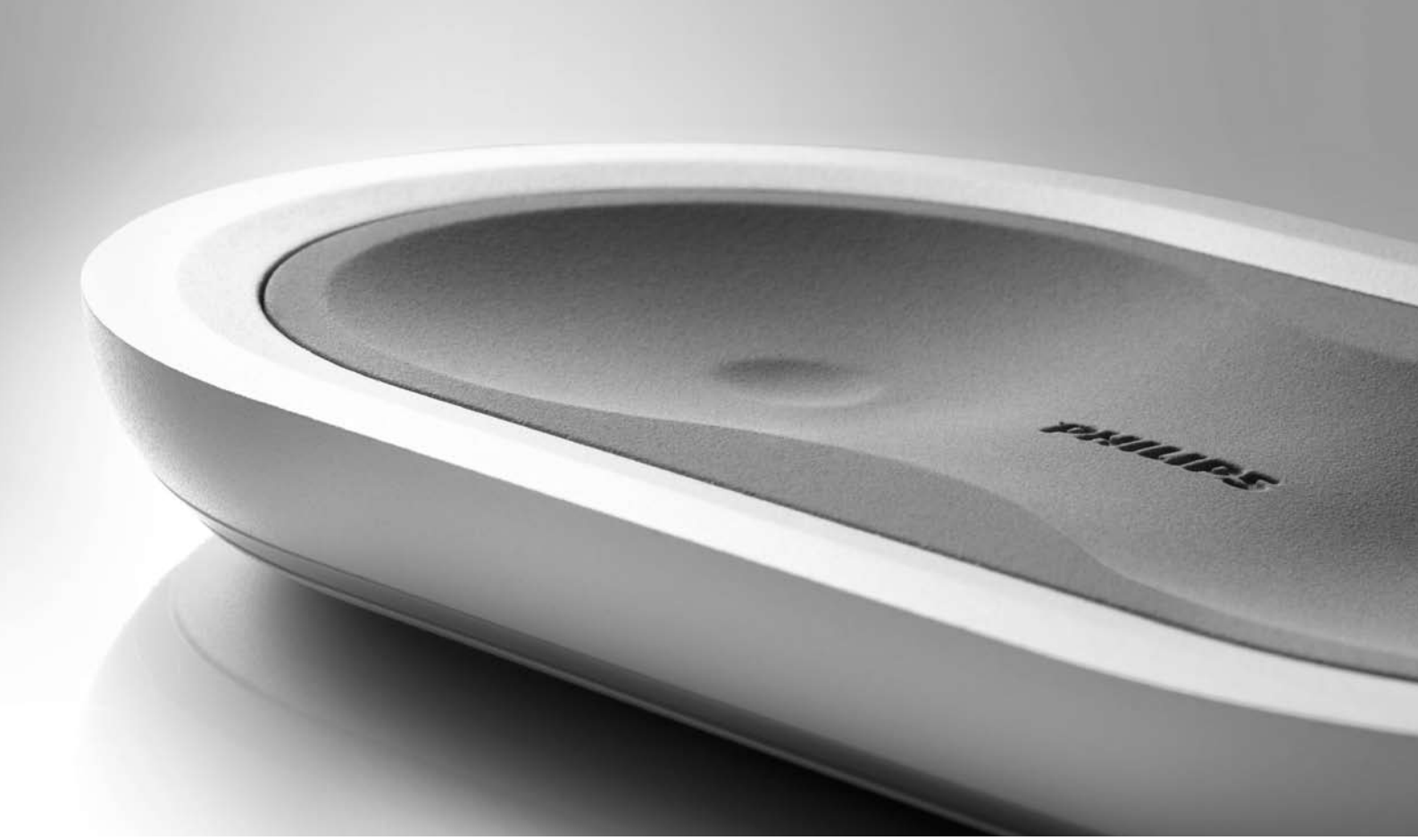
Another example of a theory which stresses the relationship between mind and body is Csíkszentmihály's concept of flow [5]. Flow is the phenomenon which occurs when the user is completely absorbed in an activity for its own sake. When in flow people loose their feeling of self-consciousness, their focus of awareness is narrowed down to the activity itself, resulting in action-awareness merging. When in flow, users forget their immediate surroundings and experience a sense of timelessness. Flow is described as a highly enjoyable, effortless experience which happens when the challenge posed by the task is in balance with one's ability level.

Whilst concepts such as mindfulness and flow have only recently made inroads in Western science, the discipline of overcoming the duality of self and object has been a central feature of spiritual development in Eastern philosophies such as Buddhism and Taoism. Such thinking has reached the West mainly in applied forms such as yoga, tai-chi and martial arts. From these applications it becomes apparent that certain motor actions can only be carried out when in a particular frame of mind, whilst at the same time, certain motor actions are believed to put us into a particular frame of mind. Chinese 'baoding balls', by which MindSpheres' physical design was originally inspired, also fit into this category. According to Chinese thinking, playing with 'baoding balls' is beneficial to both mind and body, in keeping with a Chinese understanding of medicine.

Aesthetic considerations

Aesthetic of appearance: a low-key skin, a high tech core

One of our challenges in designing MindSpheres was to find an aesthetic which would be appropriate for a relaxation device. We strongly felt that the current



day 'electronic product aesthetic' (e.g. high gloss finishes, LCD displays) would be inappropriate for a device aimed at mental relaxation. Therefore our intention has been to avoid associations with such electronic products. Instead, we have drawn upon a domestic aesthetic, taking our inspiration from typically 'low-tech' product categories such as tableware, textiles and wooden toys.

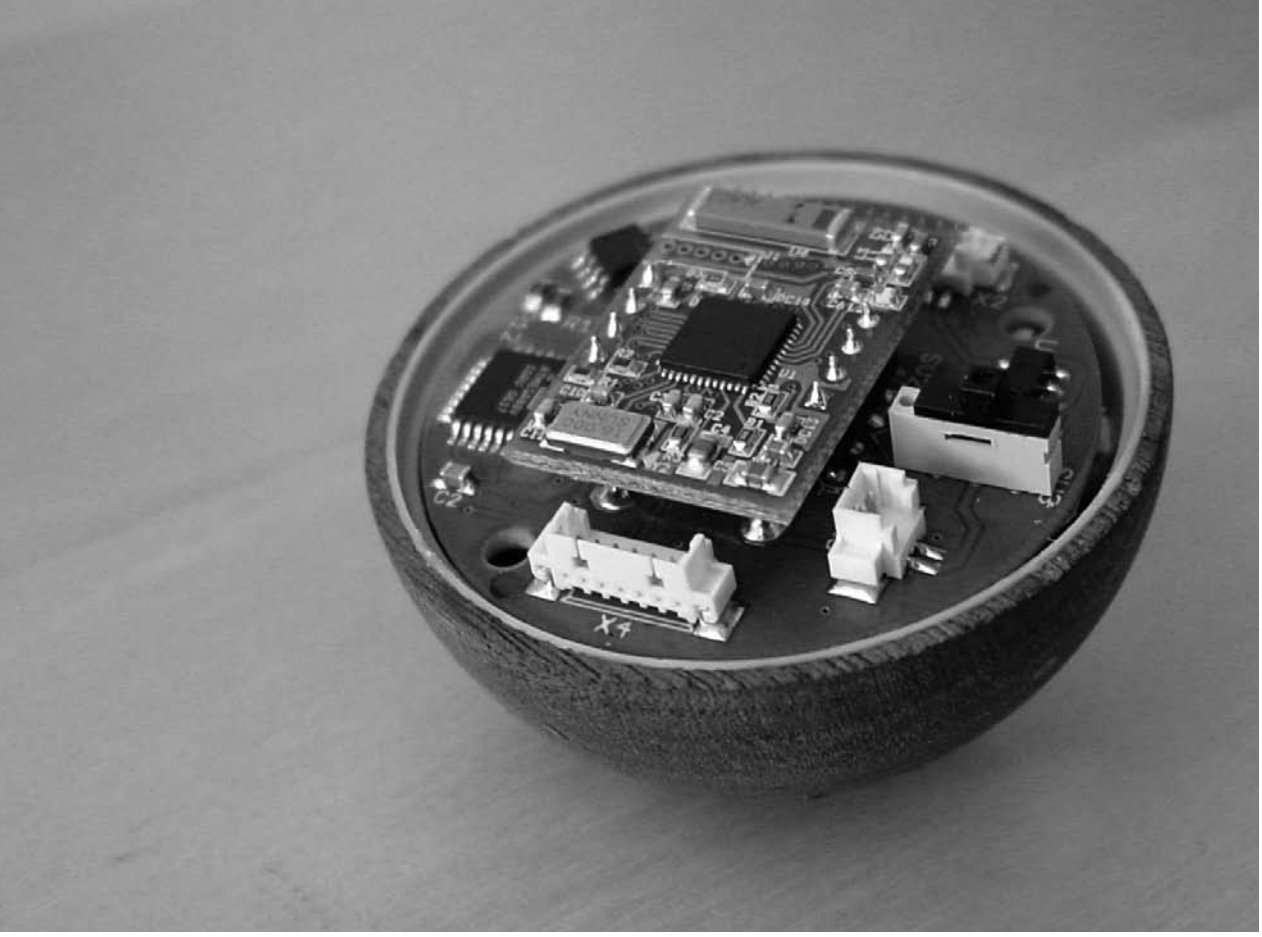
This has resulted in the dock having a simple curvi-linear form, finished in unglazed ceramic white and velvety orange, and the use of natural materials in the form of oiled walnut for the MindSpheres themselves. However, underneath this low-key exterior lies a high-tech core. Each MindSphere is equipped with accelerometers to detect movement whilst twenty high power LEDs and two vibration motors provide feedback. Motion analysis algorithms analyze the user's movements in real-time. Built-in Zigbee controllers enable wireless communication between MindSpheres and the dock. The dock itself provides wireless charging for the MindSpheres and features a 'light line' to indicate by means of colour the currently active exercise.

Aesthetics of interaction

In designing MindSpheres, we aimed to set it apart from the current product offerings in the area of relaxation. These offerings often come in the form of PC peripherals which take physiological measurements and which use the PC's screen for feedback. In our opinion, being PC-based is at friction with the application area of relaxation for a number of reasons.

On a pragmatic level, being PC based means that these devices require complex set-up procedures including software installation and configuration. It also means that when looking for relaxation, the user is bound to a PC. On a more insidious – and perhaps more important level – it means that these devices have uncomfortable connotations with the PC's productivity and efficiency oriented interaction style. The screen-based feedback creates associations either with the fast-paced, performance-oriented world of gaming through the use of 3D computer graphics, or with being physically monitored through the use of scientific-style graphics typically found in medical equipment. We think that neither of these associations are desirable in a relaxation context.

In contrast, MindSpheres is a portable, standalone device, which allows it to be used wherever the user feels is the most appropriate place to relax. Action and feedback are co-located so that users may more easily focus their attention. Finally, we feel the dynamically changing light patterns and their interaction with the moving hand have a mesmerising aesthetic quality which contributes to rather than interferes with a feeling of relaxation.



Conclusions

In keeping with Philips' interest in the area of well-being, MindSpheres is a concept which helps users relax both mentally and physically by making them focus on playful dexterous exercises. Contrary to existing relaxation devices, which infer the level of relaxation from physiological measurements of the static body, MindSpheres builds upon the interplay between our state of mind and our bodily activity. We have argued our reasons for MindSpheres' appearance as well as for its interaction style. Again and again, these reasons come back to the same thing: improving MindSpheres' aesthetic fit – in terms of appearance, in terms of interaction and in terms of context – to its key functionality: relaxation.

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