

Design research and the complexity encountered in people's critical thoughts

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Abstract

This study focuses on the concept of "Critical Design", which describes the development and use of design objects for the discussion of social and technological problem areas. "Critical Design" provokes or puzzles the consumer. Instead of offering people merely optimized and constraint action patterns, open situations and questions are created. The arising reactions provide valuable insights for innovative product development and basic design research. This paper assesses the potential of "Critical Design" approaches to be utilized as novel research tools for future challenges to design. The main contributions of this paper are threefold. Firstly, it reviews various ways of user engagement to design that reinterprets the conventional relationship of user and designer. Secondly, it selects and evaluates specific qualitative research methodologies that accept and support the active involvement of the researcher as well as the importance of letting theories "emerge" out of data, in order to develop a methodological research framework specific and original to design. Finally, the study offers an assessment of "Critical Design's" potential, to understand and deal with people in a novel and richer way and to test it as a research tool that supports complex approaches. "Critical Design" illustrates the need for design researcher to deal with complexity encountered in the general dynamic of actors and in people's critical thinking.

Keywords

Design and society, Action research, Social and cultural studies, Qualitative research methodology

1. Introduction

Before the consumer takes over possession by means of purchase, every product carries a specifically precast meaning of its own. Part of this meaning is the value model, which is attributed to the artifact by marketing's communication strategy. This model confers the aura of a brand or the corporation and consists of a defined image aimed at the desired target audience. Another part of the meaning is of rather practical nature: It consists of the definition of the intended purpose. It is the manufacturer or producer who determines this purpose of the product, i.e. the functions, which the product must fulfill, and the areas in which it shall be used. The determination of the purpose necessarily follows the needs of the consumer, while it remains to argue how these needs have been proven by empirical studies or rated as "natural" needs. In this condition, the product leaves the producer as an object, which is equipped with a number of invisible values, attributes, and definitions, or in other terms the product is equipped with a story. In recent years, the design industry has recognized these virtual values as a trend and has labeled it with the term "Storytelling" or "Narratives".

With the purchase of the product, the process of the product development could actually be

completed. However, this is obviously not the case. Only at this point does the unfolding complexity caused by the design become apparent. As soon as the user unpacks the purchased product, she begins to undermine and manipulate the idea of precast image and purpose: The product generally is not used according to the exact notion of the producer. This disobedience of the user points out the shortcomings of such predefined interpretations and definitions and reveals their arbitrary and “user-unfriendly” nature.

2. Reinterpreting the relationship between user and designer

2.1 Subversion of the function

Brandes et al. coined the term “Non Intentional Design” or NID (Brandes et al. 2000) to describe the aforementioned reinterpretation of product functions. They describe this phenomenon with the “everyday redesign of the designed product”. Thereby, “Non Intentional” does not refer to the purpose, but rather to the process of design. NID in fact has an intentional goal or dedication: by inventing new possible applications and producing new narratives, the user satisfies unmet needs neglected by the original product design. However, it is not a deliberate design activity, since the change of the operation is carried out at a visceral level. More likely, it is a reflex, a reaction to the restrictions, which the object embodies.

“According to the motivation, no design results [...] since the impulse to consciously create design is missing. Non Intentional Design is not characterized or driven by the creative will.”
(Brandes et al. 2000)

NID primarily happens in everyday handling of products, anytime the users change the predetermined purpose of an object. Turning a chair into a wardrobe could be one scenario to illustrate such a situation. Instead of using the hooks of a wardrobe, one uses the backrest of a chair to hang up the jacket. At that moment, the real function of the chair is reinterpreted. The chair turns into a wardrobe, because to the user it might appear to be the better satisfier to the need of storing one's clothes. The motives for this repurposing can be versatile and deliver information about the user's complex patterns of requirements: The chair might facilitate a better drying of the jacket, it might be closer to the user giving her a more secure feeling or it might allow the user to faster access things, which are kept in the jacket. Of course, these are only some possibilities motivated by the concept of NID. A deeper understanding of the processes during the use of objects is necessary to achieve a design that better considers the use situation and the complex needs involved. Thus, it is highly relevant to the quality of design outcomes to understand that the user's motives to handle a product in other than the “built-in” or designed ways are an attempt to remedy a situated deficit. The observations of the everyday redesign processes in the context of NID show that there are many deficiencies, which have to be addressed by investigations to inform design about novel necessities and unforeseen requirements.

Unlike NID, the so-called formation of “Beta-Tester” (Dunne, Raby 2001) intentionally confronts themselves with the redesign of objects. The term “beta” thereby is a well-suited metaphor for the processes of hacking and manipulating predetermined design concepts. The Beta as the second character of the Greek alphabet is used as an attribute to describe a second version of a Narrative or product meaning, which is not precast by the designer but interpreted by the user. Analogous, a similar meaning can be found in the field of software: the Beta-version is commonly a preliminary form of newer or advanced software, which is initially tested by the user before its market launch.

Similarly to the users involved in the processes of NID, Beta-Tester as well perform a repurposing. Yet, this misappropriation is conducted within a framework of an intentional design process and therefore it is a planned and conscientious act of designing by the user.

Beta-Tester, in a playful and exploratory way, redesign existing objects in order to utilize them beyond their initial purposes for their individually defined aims. As seen with NID, Beta-Tester also practice reformatting and overwriting existing Narratives by formulating and telling their own stories of use. In addition to this reappropriation, Beta-Testing involves a manipulation of physical forms and surfaces of the object, making it similar to hacking practices.

Fiona Raby and Anthony Dunne exemplify various Beta-Tester in their book “Design Noir”. For instance, they mention the “Anarchist Cookbook”, in which instructions are given to create sophisticated weapons out of everyday objects, or a group of athletes who with the deployment of radio antennas, receivers, and radio direction finders conduct some kind of urban orienteering where they try to recover electronic transmitter that have been hidden in the field. With the latter example, it becomes apparent that this extreme “disobedience” to the prefabricated world of consumption requires a substantial degree of technical knowledge and familiarity with the devices and the tools needed for the production of such equipment.

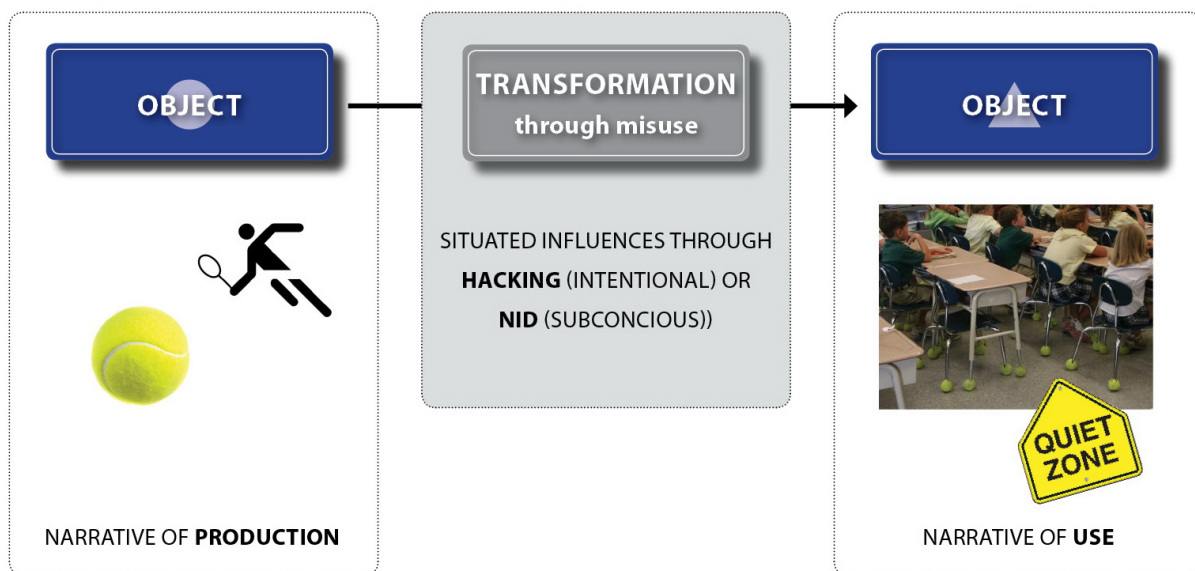


Figure 1 Subversion of the Function. Tennis balls serve as cushion to reduce the noise caused by moving school furniture.

2.2 From Consumer to Prosumer

The aforementioned phenomena emphasize the existence of reappropriation and redesign tendencies with narratives in the use of objects. Thereby, we are dealing with motivations that, driven by product deficiencies or dissatisfactions in the situation of use, aim at overcoming the status quo. Similarly, there are many other modification tactics in the world of consumer products: car-tuning, accessories in fashion, DIY, cooking, case-modding of computer boxes, just to mention a few. In most of the cases, the driving force to redesign is the desire for individuality: modifying, extending, recreating, or redefining oneself.

“Overall, making things is not an end in itself, but has to be regarded as a automatism of an incremental process of identity formation under the constraints of a progressing individualization. When there is an abundance of possibilities, orientation and thus identity can only be constructed piece by piece instead of one big cast.” (Liebl, Düllo, Kiel 2005)

Be it of a purely functional or individualistic nature, the user obviously has a fundamental drive to design. Taking a glance at today's Open Source cultures and noticing the flourish of Blogs, the efforts of autonomous design activities in the digital and virtual world are already highly advanced. In this way the roles of producer and consumer converge to a new role which Alvin

Toffler in his book from 1980, "The Third Wave", has called the "Prosumer" (Toffler 1984)

The development of consumers actively participating in the design should not frighten the designers. Surely, there is no trend towards a society without designers. It rather shows that the effort is worthwhile to pay more attention to the use-situation. Considering the phenomena of the participating consumer, interesting and useful insights can be collected to inform product development from specific use-situations. It must therefore be the aim to understand the circumstances, mechanisms and goals related to the use-situation to better analyze the underlying psycho-social factors.

"It is astonishing that despite this problem statement, which dates back far into the eighties there is still no qualitative Design Research and the Study of the everyday life in the field of design." (Brandes et al. 2000)

The aim of this study will thus be to describe the processes involved in the transformation of artifacts, from the designed object to an object of use, and how this alteration or translation process could be specifically utilized in design research, in order to better understand people's motivations, behaviors, and "Complicated Pleasures". In the end, this will lead to a qualitative improvement of design outcomes.

In the following, specific qualitative research methodologies that accept and support the active involvement of the researcher are reviewed. Those approaches are crucial to portray people's motivations and behaviors, and they recognize the importance of letting theories "emerge" out of data to develop methodological research frameworks specific and original to design.

3. Design as a research tool

In his article "Research in Art and Design" (Frayling 1993), Christopher Frayling classifies design research in three distinct directions: research INTO art and design, research FOR art and design, and research THROUGH art and design.

The design aspects within this classification are as follows.

1. Research INTO design: e.g. Design History (operates in a scientific-observing manner, i.e. observing from the distance without influencing the subject.)
2. Research FOR design: e.g. Market Research or Consumer Research (provides necessary insights for the design process. Designers can deliver those results. However, those can be of varying use to others due to the specific constraints applied by the design methodology.)
3. Research THROUGH design: Design Practice as Research (allows the researcher to design the subject of study as well as the study context with all its elements.)

The vast majority of the Anglophone design research emphasizes the two first categories as central part acknowledging design as a scientific discipline. Looking at the slow advancements in higher theoretical design education, the existence of research through design still seems to lack credibility. Yet, possibilities of scientific methodical approaches towards design do exist. They are from the sociology-based area of qualitative research and are already applied in design:

- *Action Research*: as a method for changing the practice
- *Grounded Theory*: as a method to develop a theory
- *Mode-2* research: as a method with inter-relationships between science and society

These methods accept and support the active involvement of the researcher as well as the

importance of letting theories “emerge” out of data. Theories are no longer considered mere verifications of previously stated hypotheses just to affirm existing coherences. Rather, they are understood to openly interact with an instable study area, and always being flexible to change. Immediacy to the subject of study and ways to cope with inexactness and uncertainty are new challenges with this approach. Therefore, when talking about design research it is impossible to reduce its methodologies to the first two categories of researching into and for design. They might offer scientific innocuousness, however they do not lead to what design research could become: a self-contained and original research domain that is closer to the real world. Hence, the challenge is to look for a method specific and original to design, which orients itself to the aforementioned areas of qualitative research and emancipates itself from rigid and traditional Mode-1 research, by introducing new methodologies that are more adaptive to current challenges and problems.

3.1 Action Research

During his time at MIT in 1944, Psychologist Kurt Lewin coined the term “action research”. In a paper published in 1946 titled “Action Research and Minority Problems” he described action research as “a comparative research on the conditions and effects of various forms of social action and research leading to social action that uses a spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action” (Lewin 1946).

Action research in its origin primarily saw itself as criticism to traditional social research through which it not only made a methodological but also an epistemological contribution. At the level of methodology, Lewin denounced the increasing estrangement between sociological theory and practice. The aim was that science could and should change the field of practice. Therefore, action research was considered a study within the social domain where there should be no more strict separation of the researcher and the participant and where social change as well as the activation of the participant should be the main goal.

At the level of epistemology, Wadsworth considered action or participatory research not only as a method but also as a general paradigm for research. He claimed that action researchers are simply conscious of the unavoidable fact that they influence the object of research by their examinations:

“Action researchers, it seems to me, are really just researchers who have come to understand the practical and ethical implications of the inevitability of the value-driven and action-effects of their inquiry, that is:

- *the effects of raising some questions and not others,*
- *the effects of involving some people in the process and not others,*
- *the effects of observing some phenomena and not others,*
- *the effects of making this sense of it and not alternative senses, and*
- *the effects of deciding to take this action as a result of it rather than any other action.”*
(Wadsworth 1998)

Through action research, the researcher is intentionally integrated as a stimulating actor.

3.2 Grounded Theory

In Grounded Theory, (Glaser, Strauss 1967) the relationship of theory and empiricism consists of the principle of openness and of the communication. The principle of openness states that the theoretical structuring of the object of research is held back until the structuring of the object by the research subjects has taken shape. To avoid any pre-knowledge and prejudices

at the beginning of an examination, a clarifying discussion by the means of brainstorming or analysis is required. The principle of communication refers to a communicative research concept which considers the interaction between researcher and participant and suggests the communication rules and interaction forms.

3.3 Mode 2 Research

Another concept from social studies is the so-called Mode-2 research (Gibbons et al. 1994). Gibbons et al. argued that a new form of knowledge production started emerging from the mid 20th century which is context-driven, problem-focused and interdisciplinary. It is closely related to the methods of qualitative social research, however, seeks for an approach to bridge from classic science methods over to application-oriented methods. Instead of special academic interests, real problem definitions from practice are the motivators of the research. The following table shows a comparison of the research approaches. It summarizes features of the approaches discussed here and mentions possible characteristics of design oriented research, which is transformed from the subject-object relation of conventional social research into a subject-subject relation.

Table 1 Comparison of qualitative research approaches.

	MODE 1	MODE 2
Problem statement/ solution	In the academic community	In the situational context
Aim of research	Fundamental principles and their integration into theories	Contextualized result and their application
Research content	Bound to disciplines	Trans-Disciplinary
Research structure	Hierarchical und homogenous	Transient, heterogeneous
Quality control	Fixed to expert judgment	Multidimensional/use-oriented
Communication	One-way Information transfer from science to society	Diffusion process/interactive relationships between science and society

4. “Critical Design” as a research tool supporting complex approaches

4.1 Conservative Products

In his book “The System of Things” (Baudrillard 2006) Jean Baudrillard talks of how nowadays products force their rhythm upon people instead of people determining their rhythm by themselves. This surely applies to many products. For example, there are automatic error corrections in computer interfaces, ergonomic regulations in furniture, assisting “wizards” in cars, etc. that are all supposed to simplify things by spoon-feeding the user. It is all about the apparent optimization of use. Yet, in the actual use, these optimizations are often perceived as restrictions and thus are consciously or unconsciously ignored. Even if, as a designer, one detects something about the true, complex desires of users, there still is the client with her wishes and her cost-benefit calculations, which hinder the development of better products. This inevitably results in even more so-called “Conservative Products” (Auger 2005), which go by the dominantly established understanding of supposed optimal user satisfaction, and thereby jam developments in new directions. Design that orientates itself to existing markets and its products without analyzing them cannot bring any change. Dunne & Raby describe

this uncritically confirming design as “Affirmative Design” (Dunne, Raby 2001).

4.2 Wondering Products

What could be the counter balance to these conservative products, which exclusively affirm the status quo and which embody the normative or official standpoint?

“Beneath the glossy surface of official design lurks a dark and strange world driven by real human needs. A place where electronic objects co-star in a noir thriller, working with likeminded individuals to escape normalism and ensure that even a totally manufactured environment has room for danger, adventure and transgression. We don’t think that design can ever fully anticipate the richness of this unofficial world and neither should it. But it can draw inspiration from it and develop new design approaches so that our new environment evolves; there is still scope for rich and complex human pleasure.” (Dunne, Raby 2001)

In accordance to Dunne and Raby, we argue that the counterparts to conservative products are artifacts that raise questions. It has to be products that are subject to uncertainty, which suggest open ways of use, and which question existing use patterns. On the one hand, this is a reaction to the lessons learned from the NID concept, on the other we are supporting the required reorientation towards more qualitative aspects of design research that adapt to the users’ improvised behaviors.

In their free play with things, users steadily test the boundaries of new values and norms creating unforeseen situations. This uncertainty must be turned into strength. Anthony Dunne claims, designers cannot expect to be able to dictate users’ behavior with absolute rules and fixed structures anymore.

“All he or she can offer are the contents of his or her own head, where internal imagination meets the external world of reality. Design is used as a strategy for linking these two worlds. Its outcome consists of conceptual design proposals offering a critique of the present through the material embodiment of functions derived from alternative value systems” (Dunne, Raby 2001)

Those conceptual design proposals stand between the imaginary and reality. They relate to Values and behavioral patterns, which are hypothetical or just made up, resulting in so-called “Value Fictions” (Dunne, Raby 2001) that are the basis of further designs. As we are moving around in this fictional world, we as designer are able to act like authors of stories. Fictions allow us to imagine any kind of condition, to ask questions, and to turn possibilities into subjects of discussion. Treated as actual possibilities, those fictions serve to make concepts and imaginations subjectively graspable for the reflection of our individual narrative. Hypothetical objects and products therefore contain some poetic aspects that allow us to experience imagined concepts closer to reality.

At this point, provocations and irritating objects are able to be reappropriated to enable new experiences far beyond usability. The Experiences are all about situations that evoke reactions. Furthermore, stimulating products are intended to play a crucial part in the analysis of those reactions. This kind of design facilitates to create wondering products, objects that ask questions, which can be used to address, illuminate, and even produce research-topics.

This kind of design is what Anthony Dunne calls “Critical Design” (Dunne 2006) as opposed to the earlier mentioned affirmative design. It offers the design-inherent qualities of mediating and illustrating complex problems and gives the user deeper insights to implications of current societal and technological developments. In this sense, “Critical Design” fulfills the educational responsibility to inform people, to communicate contemporary issues, and to offer the designer an opportunity to dive into the research field during the early stage of the design phase. The user’s reception therefore becomes a productive part of the design process.

“Critical Design needn’t be judgmental of any particular technology, it simply asks for a more complete debate on how it is applied, who is applying it and how we could be affected by its mediation of our lives. Successful “Critical Design” comes about from good balance and application of three things:

1. *The application and usage of technology should be relatively feasible, i.e. the concept cannot easily be dismissed as science fiction.*
2. *The design concept, product or service needs to be desirable in both form and function.*
3. *Communication is of fundamental importance. This is why the written word usually reaches such a limited audience; a page of complex text does not encourage the average person to read on. A sophisticated “Critical Design” proposal can utilize props, newspaper articles and other means to entice and coax the audience into the discussion.” (Auger 2005)*

“Critical Design” demands for dispute, enlightens researches, mediates and communicates through design.

Table 2 “Critical Design’s” impact in project-works

MODE OF ACTION	PROJECT EXAMPLES
Stimulation (of the research field)	Stimulating: “Iso Phone” (James Auger), “Social Mobile” (Crispin Jones)
Simulation (of discussions)	Discussing: [all “Critical Design” projects raise discussions]
Measurement (for analysis)	Observing: “Placebo” (Dunne & Raby)
Comment (as a statement)	Commenting: “Huggable Mushroom” (Dunne & Raby)
Mediation (of complex topics)	Mediating: “Bio Jewelry” (Tobie Kerridge)

4.3 “Critical Design” as a research probe

Is “Critical Design” suited as a means of research? The table describing “Critical Design’s” impact in project-works shows four modes of action that illustrate its versatility as a research tool. The first two are “stimulation” and “measurement”. The metaphor of probe is an interesting approach to describe how “Critical Design” accomplishes these two modes. In its original meaning, a probe stimulates and at the same time senses. Both procedures of stimulation and measuring influence and change the study-objects simultaneously. The Heisenberg Uncertainty Principle already described this phenomenon that it is impossible to observe without changing the observed. This universal rule leads to the notion that fuzziness or blur are inseparable parts of nature that have to be accepted and dealt with. By including the aspect of uncertainty, the focus shifts on qualitative aspects of research that incorporate the idea of instability. Action Research and Grounded Theory, the two established methods of qualitative research discussed earlier, strongly relate to this principle of observing in the field and stimulating through interventions. “Critical Design” thus shows a natural affinity to those qualitative research methods.

The remaining two modes, “comment” and “mediation”, emerge from Dunne & Raby’s original concept. They stand for the development and use of design objects to raise discussions about societal and technological issues. Objects of “Critical Design” challenge the user by provoking or irritating them. The resulting reactions provide valuable insights for the product

development that, for instance, could be revealing implications of new technologies. Projects like Dunne & Raby's Huggable Mushroom or Auger and Loizeau's IsoPhone exemplify how objects turn into critical comments on technology and mediate the issue in ways of embodying the statement, so that it can be discussed. They try to test the psychosocial limits of the user by questioning usages of technology.

Hence, "Critical Design" proves to have high potential to pick up debates on relevant issues in order to test them for further research and to inform early design processes. It is a useful research tool for the designer, which lets people substantially benefit from it: The mediation of technology and the probing of unprecedented possibilities in everyday life give people a useful tool that empowers them to self-engage with previously unnoticed issues and shape a personal attitude towards the same.

About the work of Dunne & Raby, who have pioneered this design approach, there is one crucial thing that is still missing in their practice. They only conduct a limited empirical analysis of people's reactions. Like the aforementioned probe, which provides observation data as well as stimulates the study object, "Critical Design" could sense and assess the importance, acceptance and integration of technology in everyday life.

4.4 The detachment from technology

The areas that Auger and Dunne mainly focus on are discussions about the implications of new technologies and their influence on everyday life. People as anti heroes of the quotidian life are confronted with invisible technologies such as electromagnetic radiation, radio waves, or other forms of data transmission. Many disclosed aspects, which design can make accessible for experience and vision are found in these topics, so that thinking about these technologies can be designed more effectively.

At first, the important aspect is to make the ability for critique possible, by avoiding any readymade opinions or fixed statements, and permitting future technologies to enter the personal sphere as a possible part of one's everyday life. The mediations of invisible or fluid technologies through physical interfaces is especially important to those people who are not so familiar with newer technologies, since they do not belong to the young, technology oriented, early adopters who have the money to buy e.g. the latest gadgets. In contrast to those, older and poorer people need a different access to technology. Thus, objects conceived as an interface to technology are the medium with which the particular and the society are able to recognize and identify themselves. In other words, in the industrial society there is a gap between the ability to use technology and the ability to integrate that technology personally and socially so that it becomes meaningful and individually relevant.

What do we get as we define these two positions as extremes? In the first case of early adopters, there is an uncritical and barely reflected relationship to technology, while in the second case of the elderly or the poor there are fears of contact and lack of understanding. For the first group the affirmative design develops gadgets with increasingly more functions and steadily growing usability as sign of a rising optimization. The affirmative design however does not develop those gadgets in the light of a meaningful integration to our everyday lives, but rather to bring them closer to or even into our human bodies. For the second group existing products are generally simplified to keep the people away from the real potential of the technology. In conclusion, technology is either invading and conquering or isolating and discriminating us through affirmative design. It is to question whether this quantitative outlook on the future relationship between humans and technology that is caused by affirmative design a desirable one.

A qualitative access to technologies must produce a necessary distance to them, so that other opportunities get visible, and that the optimization of objects does not simply happen based

on a pure interface improvement between man and machine. Interface theorists like Donald A. Norman may have pioneered concepts of user-centered designs, yet those may fail to provide deeper values to people, as they do not pick up the social integration, meaning, and the development of new use-possibilities for products as the central theme.

4.5 A new prospect: Heterotopia

Utopia is always about escape and dream, as mystical scenarios filter the present real-world. Yet, how can we achieve that the desire for improvement in the world will not be exhausted in naive wishing? Design's credibility as a research discipline has always suffered from being too illusory. Consequently, the time for Utopia and utopian designs has to be over, since today's challenges do not demand for unreal and readymade visions that are inaccessibly rooted in the ideal world. However, what are other options to Utopia? Within the limitations of this paper, the authors introduce a fundamental notion to a methodology based on "Critical Design" that sits between science and art and that replaces utopian designs.

Such a design methodology would have to clarify aspects of its mode of engagement to avoid two common pitfalls. These are first, how far design manages to aestheticize without getting egocentric and unratable so that it would become Art, and second, how design activities gain accountability without losing their inspirational autonomy so that it would become Science. Since we are talking about design, one too obvious mode of engagement would be that of spreading utopian fragments through tangible objects and enactable scenarios in order to refresh our perception of the presence, to confuse the people and to provoke their reflection. This is partially happening already, however with little impact. Another more subtle mode would be the formation of a sense for possibility, which pushes aside pointless dreaming by promoting debates about the possible and the desirable and introducing a complementary model called "Heterotopia". It stands for actual 'places' integrated in the real society, in which autonomous rules of their own are valid, but also in which the social values of the real world are mirrored. Michel Foucault says:

"There are also, probably in every culture, in every civilization, real places - places that do exist and that are formed in the very founding of society - which are something like counter-sites, a kind of effectively enacted utopia in which the real sites, all the other real sites that can be found within the culture, are simultaneously represented, contested, and inverted. Places of this kind are outside of all places, even though it may be possible to indicate their location in reality." (Foucault 1967)

Foucault exemplifies such places as hospitals, prisons, elderly homes, cemeteries, or even travel journeys. Despite their reality, these places offer a large projection surface, which design can use. The garden, the theatre or the ship as metaphors provide us a "reservoir of imagination". We can utilize this "reservoir" with heterotopian products inspired by a "Critical Design" approach.

The concept of Heterotopia, which Anthony Dunne also describes in his book "Hertzian Tales", might become clearer through the help of a medical definition. Medically speaking, Heterotopia stands for a shift of healthy body tissue to an unusual or wrong place, where it causes vivacious activation. In accordance, a heterotopian concept of design could be understood as design being within society to which it brings constructive unrest, whereas the conventional utopian concept of design would locate it outside society, where it rather has a mesmerizing and even narcotic effect. Unlike science or the arts, which stand outside society to merely comment on it, industrial design has always been deeply rooted within popular culture and the everyday life and has always been commented on. This position of design bears great potential for a design research that emancipates itself from the shortcomings of overly rigid scientific approaches as well as from unaccountable artistic outbreaks. Design having an intrinsic heterotopian potential can inspire researchers across the disciplines for

more 'designerly ways' in research. Would the true question even be whether science and art are not becoming design in the moment in which they leave their utopian position?

5. Future work

"Design is not engaging with the social, cultural and ethical implications of the technologies it makes so sexy and consumable." (Dunne, Raby 2001)

Besides a first impression of the opportunities and potentials of "Critical Design" as a research tool, questions have primarily resulted from this study. There is a necessity to investigate following questions in further researches:

- *Which roots and parallels are there in art history and other past practices?*
- *To which areas can "Critical Design" approaches be applied?*
- *In which context (research facilities, teaching, product development etc.) can "Critical Design" be established as a method?*
- *Is the arising discussion that is activated by "Critical Design" measurable through empirical studies?*
- *Are there alternative concepts for the technological economic understanding of efficiency and rationality?*

6. Conclusions

The world today is incredibly complex and our social relations, human desires, personal fantasies, hopes and fears are very different from the beginning of the 20th century, when design began to emerge as a disciplined activity. Since then the general image of humans has matured, becoming richer, messier, and increasingly down-to-earth. Most areas of culture have accepted that humans are complex, contradictory, even neurotic, yet design has not. Still, abstruse or complex emotions are mostly ignored in mainstream design. Instead, many designers keep considering people as predominantly obedient, predictable, and rational users/consumers, while neglecting those "complicated pleasures" that arise from the darker, puzzling side of human nature. In this world of increasing complexity, Anthony Dunne and Fiona Raby explain that the focus in design shifts to products, which pander to the side of people that is complicated, irrational, and contradictory. For that purpose, they introduced the concept of "Critical Design", which so far can be described as the development and use of design objects for the discussion about social and technological problem areas. "Critical Design" provokes or confuses the user to elicit thoughts and attitudes that are subconsciously hidden or held back within the people's mind. Instead of offering people merely optimized and therefore constraint action patterns, open situations and questions are created. The arising reactions provide valuable insights for product development and especially for design research. "Critical Design" emphasizes questions to complex pleasures and existential design. Therefore, this study has assessed the potential of "Critical Design" to be utilized as a novel research tool by utilizing conceptual products as a "medium that fuses complex narratives with everyday life" (Dunne, Raby 2001).

"Critical Design" illustrates the need for design researcher to deal with complexity encountered in the general dynamic of actors and in people's critical thinking. As Elizabeth Sanders and Pieter Stappers noted that, „What is being designed will change. Larger views across space and time will be needed. New tools and methods for design research will be needed to address increasing scope, scale and complexity.“ (Sanders, Stappers 2008), it is becoming apparent that sticking only to its existing knowledge, design might not tackle future

challenges. On this Background, the goal of this paper is to explore novel and suitable approaches to deal with and conceptualize the complexity that is involved in the interplay of design and people.

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