PRODUCT-FRIENDLY USER DESIGN;
A CRITICAL DISCOURSE ON USER-CENTERED METHODOLOGY

Alexandros Zakkas / Stella Boess / Lenneke Kuijer
Delft University of Technology
alexzakkas@gmail.com / s.u.boess@tudelft.nl / S.C.Kuijer@tudelft.nl

ABSTRACT

User-centered design risks becoming user design; turning people into users. The more successful the design, the quicker and easier we adopt the model of a user that the design evolved around, and uncritically embrace behavior and preference patterns scripted in this model – often unconsciously by the designers themselves. This research generates a critical discourse from a literature review. It discusses the conceptual models about 'users' that designers design around, challenges design preconceptions of 'user-friendliness' and explores experimental approaches that embrace the unpredictable complexities of real-life experiences as creative possibilities.

Keywords: Usability; Critical Design; Practice Theory; User Experience

INTRODUCTION

INITIAL CONTEXT ANALYSIS

This research project starts within the framework of usability design, in the wider context of user-centered approach to interaction design. It takes the Design for Usability project, a cooperation between the three university based design programs in the Netherlands, as an example and starting point, from an outside perspective.

The Design for Usability (DfU) project focuses mainly on interaction with electronic consumer products. The project investigates the causes of mismatch between actual use and as intended by the manufacturer, and aims to generate methodology for "*designing products that minimize user complaints and market loss*" (Van Eijk, 2009),
User research is led by the assumption that "*better understanding of user behavior will generate insight for designing user-friendly products that match user expectations*" (Van Eijk, 2009).
The terms 'usability' and 'user-friendliness' seem to converge towards the goal of achieving a 'perfect match' between user and product and "*making the world more usable*" is often used synonymously with "*improving people's lives*" (Van Eijk, 2009).
There are, however, reasons to be sceptical of the user-centered approach as some of the presumptions that inform it are rarely challenged.

"*Guiding user's experience towards desired behavior*" (Dorrestijn and Tromp, 2009) implies configuring user expectations and reactions towards new products. The intent to generate desired behavior can, of course, be used for various aims. To improve usability, as designers and design researchers tend to hope and state, but also to make people more productive, more willing to consume. The approach can be used to accelerate and ease the process of assimilating new products in daily practices. But as practice theory helps illustrate, these practices may often reproduce environmentally and socially unsustainable consumption patterns. "*People are 'imprisoned by learned routines,' that accrue over a long period of time until they are conducted unconsciously and non-reflexively*". (Hielscher et al, 2007) What is 'desired behavior' should therefore be questioned.

The DfU project addresses issues of social sustainability from the perspective of product impact

and aims to develop methodology to 'design for behavior': "*how can user behavior be guided and changed through design? Anticipating how products guide and change user behavior can help prevent undesired product use or promote a desired behavior change*" (Dorrestijn and Tromp, 2009).

As this research paper will argue, user-centered design can be used to aid manufacturing corporations' profit aims at the cost of increasing consumers' inflexibility, over-specialization and blind reliance on consumer goods. Moreover, the cost of resolving ethical and political choices by means of technologies embedded in products may be a stagnating capacity to negotiate the conditions of social interaction (Latour, 1992).
More attractive, user-friendly or sustainable design is not going to reduce these costs, as long as it evolves around a concept of a user waiting to be satisfied by products that make life easier, provide ready-made answers and match learned routines of thought and action. This will be elaborated in this paper.

OBJECTIVES

Having identified the main foci of critique on the user-centered approach through an initial context analysis, this research generates a critical discourse from a literature review. It discusses the conceptual models about 'users' that designers design around, challenges design preconceptions of 'user-friendliness' and explores alternative approaches that embrace the unpredictable complexities of real-life experiences as creative possibilities.

Three explorative research questions spring from the context analysis and are used to guide literature selection:

1. How does the concept of 'a user' feature in user-centered design methodology and how does it influence product design?

2. As usability seems to coincide with user-friendliness towards the goal of 'products that match user expectations', to what degree does 'matching user expectations' then become 'prescribing user expectations' and what is the role of usability in this process?

3. What is the role of usability when designing products that aim to guide and change user behavior?

METHOD

A deconstructive analysis of an example user-centered design methodology (the Design for Usability project (Van Eijk, 2009)) is made. The terms used in it are charted in mind-maps, interrelating and assessing concepts anew. The analysis provides the keywords for an explorative literature review that seeks to answer the research questions. Such keywords are, for example, user-product (mis-) match, user testing, target user, user practices and user behaviour. This process itself generates new keywords that initiate further exploration.

The literature selection is not limited to the field of design, but reaches into theory of social practices, semiotics, philosophy of technology and art practices that deal with relevant issues. The findings are juxtaposed and linked to the research objectives in order to construct theoretical ground for argumentation and fertilize 'ways out' – alternative approaches to interaction design that overcome the limitations of the user-centered approach.

RESULTS

FOCUSING ON THE USER

Until Norman (1988) popularized the need for human oriented design research, the design profession was more marketing and technology-driven and less open to considering how the real 'user' would fit into the equation. There followed a move towards understanding the behavioral, cognitive, and emotional experiences of the user. Norman (1988) described the psychology behind what he deemed 'good' and 'bad' design through examples and offered principles of 'good' design. He exalted the importance of design in our everyday lives, and the consequences of errors caused by bad designs. During the last two decades, the design and design-research community has developed a methodology in which the needs, wants, and limitations of end users of a

product are given extensive attention at each stage of the design process: User-Centered Design.

Problems of designs failing the tests of use have generated a set of ideas relating to the role of the user in design. First, that these problems can be avoided through the optimization of fit between object and user; second, that design can, or even needs to be based on knowledge about users, their capacities, abilities and desires (Redström, 2006).

These ideas seem to have pushed definitions of design towards being increasingly oriented to the user, as in accounts of, for instance, 'experience design' (Redström, 2006).

The increased interest in users and their experiences must, however, also be understood in the light of designs failing to get approval by users and situations where the intended use of designs does not translate into actual use, and how the design community has in turn responded to this. A major response to designs failing to gain approval and acceptance has been to consider it to be a matter of insufficient knowledge about people, their capacities, needs and desires and that design therefore needs to be based on the improvement of such knowledge (Redström, 2006).

Following this line of thought, the DfU project aims to generate insight for designing user-friendly products that match user expectations by better understanding of user behavior (Van Eijk, 2009).

Usability becomes the key to translate this knowledge into user-friendly products that match user expectations.

MODELING THE USER

Definition of Usability: The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use (ISO 924-11). Or in everyday language: 'Is the user able to use the product?' (Van Eijk, 2009).

To start with, who are the 'specified users'?

A certain group of people is defined as the 'target group' (ex: elderly people, young mothers). The target group is described in terms of lifestyle, habits, routines, consumption preferences, physical and cultural characteristics, concerns and needs. This knowledge is translated into design guidelines of what a product/service should be or do in order to address the target group's needs. Once we start thinking of possible products and how they will be used by the target group, this group of people becomes 'the target user'.

User research is carried out to understand the target user's behavior in terms of use-practices within a context of interactions. User research may involve observational research of user activities, interviews with people that fit the user profile, probes that collect information about user's habits and routines, and co-design activities with people that fit the user profile. Apart from ergonomic characteristics, perceptual and cognitive models are constructed and related to what and how things are used in the context that the new product is designed to fit. Once this knowledge is rendered to design specifications, the 'target user' becomes the 'specified user'.

An inherent limitation of this method has to do with the obvious fact that one can only observe what exists, or what participants in co-design are willing to show. Design researchers studying user behavior can in fact only gather knowledge on use-practices assumed to be normal, and from a limited sample of users. A certain educated projection into future practices, combined with an assumed generalization of the sample's behavior is still needed to render this knowledge useful for designing future products. Based on these assumptions, user-models are specified, and together 'specified goals' and the 'specified context' of using the product.

Actual use, however, can also be seen as a kind of on-going emergence and achievement (Suchman, 1987). In the process of appropriating new products in actual use-practices, there will always be, to various degrees, a difference between the intended use that governs the design process (with 'specified goals' in a 'specified context') and the eventual use

of the resulting design. It is the very notion of *use* that creates tension when juxtaposed with various ways people interact with objects in unpredictable contexts and, often, for unpredictable goals. As deviation from the intended model is considered problematic when evaluating a product's usability, the reaction of designers is to 'improve usability'.

The more strategically successful the design is, the more accurately and consistently does it trigger similar thoughts in different receivers. These thoughts, in turn, cause the receiver to respond to the design in a certain way, and thus define its effectiveness. Unless the receiver comprehends the design as it was projected, the design is unsuccessful or ineffective (Redström, 2006, quoting Kazmierczak, 2003).

By yet more accurate anticipation of the intended user's interpretation of the product, designers and design researchers strive to create unequivocal affordances that elicit the envisioned user experience.

A downside of this approach – often overlooked by designers – is that as design seeks to anticipate user reactions and steer experiences with products, it systematically reduces space for improvisation and personal interpretation of 'use' (Redström, 2006).

Especially in digital artifacts, their use is often constrained by the simple generalized model of a user these objects are designed around. We unwittingly adopt roles created by the human factor specialists of large corporations (Dunne, 1999).

People never exactly match the user profile that products evolve around. In fact, they often actively resist it and reinterpret it in the process of making an object part of their life. There will always be a difference between the intended use that governs the design process and the eventual use of the resulting design. This difference is not always due to misunderstanding of the intended use but often the result of customizing, personalizing and adapting products to one's idiosyncratic preferences or to unpredictable situations (See Figure 1).

The strategy of 'improving usability' by excluding other ways of use, can end up forcing prefabricated roles (user-models) on people, which limit people's capacity to adapt to diverse and unexpected situations.

MATCHING THE USER

The consequences of this strategy can stretch beyond user complaints and market loss.

Practice theory, a group of theories from sociology that take practices as their main unit of analysis, helps illustrate how behavioral roles embedded in products reproduce unsustainable consumption patterns by creating unconscious routines of thought and action.

A practice is a routinized type of behavior which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, "things" and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge (Reckwitz, 2002).

At any given point in time a practice has a set of established understandings, procedures and objectives. Such formal and informal codifications govern conduct, though often without much reflection or conscious awareness on the part of the carriers (Warde, 2005).

The model of a 'user' that user-centered design evolves around is informed by observations of assumed normal use-practices. As this model is then projected towards the goal of designing products that seamlessly match user expectations, the formal and informal codifications governing conduct of use-practices are, in effect, re-inscribed in new products (Akrich, 2002).

'User-friendliness' helps conceal this by lubricating the process of assimilating new products and the behavior models they afford. 'Intuitive interaction' may in fact, turn into unconsciously and non-reflexively reenacting a user model that reflects established routines and the conventions about

normality, ethics and 'human nature' that inform them.

Drawing on various authors, Dunne (1999) composes a radical view on user-friendliness: *"User-friendliness is an euphemism for the subtle enslavement of the individual to the conceptual models, values and systems of thought that (electronic) objects embody. User-friendliness helps naturalize habits, norms and values established by the system of production by forming a seamless intergraded circuit between user and product."*

Evaluated in terms of a 'perfect match between user and product', it is often the least innovative designs that pass 'user testing' and make it to the market. Designs which, despite their attempt to be more sustainable technologically, end up reproducing environmentally and socially unsustainable routines of thought and action.

FITTING THE USER

The social impact that products have on the attitude and behavior of people is the topic of Design for Behavior: "*How can user behavior be guided and changed through design? Anticipating how products guide and change user behavior can help prevent undesired product use or promote a desired behavior change"* (Dorrestijn and Tromp, 2009).

The starting point of this approach is not the individual concerns of 'the user' but those of the society as a collective. A certain behavior is defined as desirable on the basis of these 'collective concerns', for instance 'social coherency'. Design becomes a matter of how to elicit the desired behavior; or, what product / interaction with a product will result in the desired behavioral change. The method follows with steps for designers to determine the type of influence (coercive, persuasive or implicit) the product should have in order to achieve the desired impact on user behavior (Dorrestijn and Tromp, 2009).

The task of usability then, is to translate the envisioned type of influence into user-product interaction. The 'perfect match' between user and product, becomes the 'perfect' compromise between individual and collective concerns.

It is the same line of reasoning as in designing user-friendly products that minimize user complains and market loss. Only instead of corporate interests, usability is here in the service of 'society as whole'. By 'cutting off' unwanted interpretations of use or 'nudging' towards desirable interactions, user experience is to be steered into complying with collectively desirable behavior.

The potential cost in both cases is also the same: passivity. Or rather *passification*; not just uncritical embrace and reproduction of behavior models but a stagnating capacity to resist and negotiate what is desirable (use, experience, behavior, private or social). The main problem of a design approach that aims to over-determine use, is not how accurate preconceived ideas of user behavior are, but that it sustains a culture of passive user-consumers becoming numb to other ways of relating to things than what is offered by the industry. And that is not an ethical issue, like the DfU project suggests, but a very practical one: "*Political action is not only the 'big gesture', but starts with mastering your direct environment. You cannot take any political action if you can't even use your table as you wish"* (Dröge-Wendel, 2011). Social sustainability also depends on people being able to use objects and shape materials the way they want and in ways that fit their intentions to adapt to, or even instigate change.

OPTIMISM IN ABUSE

Diversity in interpretation of objects through use can also be seen as holding other kinds of potential. As it seems from practice, people frequently generate alternative pictures of what the use of an object should be like.

Examples of misuse, abuse and creative re-purposing of products indicate that people do not only derive 'pleasure' and 'satisfaction' from 'user-friendliness' or even effectiveness, but also voluntarily engage in hacking interfaces or subverting functionality to address desires or concerns that were not

anticipated by designers (Figure 1, and Fulton-Suri, 2005; Brandes and Erlhoff, 2006).

Referring to unintended ways of use and the creative possibilities they offer, Dunne (1999) proposes that *"designers shouldn't try to predict and exclude misuses of objects, but rather refer to as a context of use these rich narratives that challenge the conformity of every day life by short-circuiting our emotions and states of mind. When an object's use is subverted, it is as though the protagonist is cheating the system and deriving more pleasure that he is due".*
Along similar lines, Redström (2006) argues, *"actual use, users and their experiences, ultimately is not for designers to design. Do not stabilize functions. Allow open-ended interactions and alternative interpretations. Use our knowledge about current practices to make our design ask questions about use that are open for its users to answer. Introduce elements of resistance, de-familiarization, provocation, interference with processes of acceptance".*

WAYS OUT

Having considered the downsides of over-determining interactions, the following three directions for experimentation were derived from the literature review and are now elaborated on. They explore approaches that embrace the creative possibilities of more 'open' interactions:

Makeshift users > Design for Rejection

The concept of makeshift users (McHardy et al, 2010) is about user prototypes designed to provoke discussion and instigate unstated assumptions about users to rise to the level of discourse. Building on this, Design for Rejection produces design objects that evolve around user representations that no-one wants to identify with (Figure 2). The goal is to go beyond rejection of the object at hand: trigger critical evaluation of the user models that technologies mediate and how design helps assimilate these models.

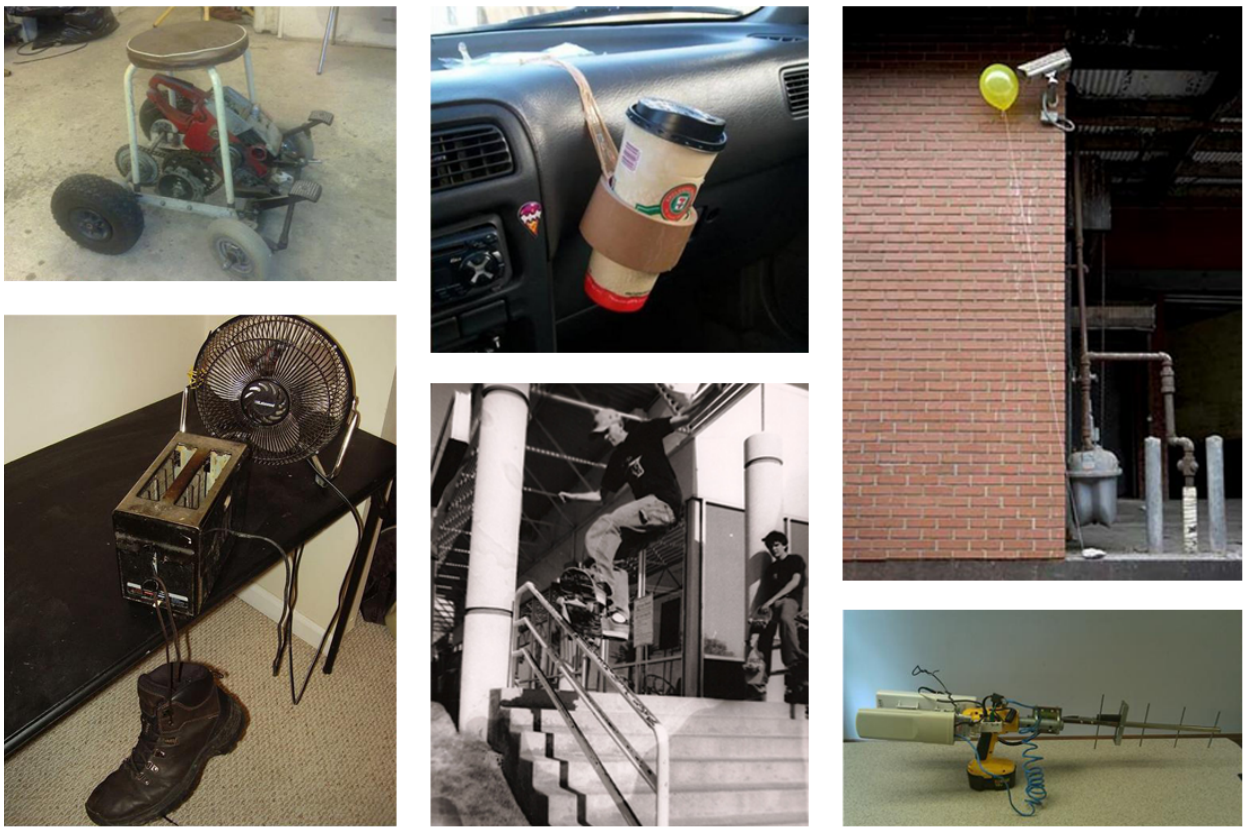

Figure 1. Examples of re-purposing objects beyond intended use. From the collection 'undesigned (www.alexzakkas.me/projects/undesigned)

Figure 2. The Mouse Trap Coffee-table Robot. From the series "Carnivorous Domestic Entertainment Robots" by James Auger and Jimmy Loizeau. www.auger-loizeau.com

Matching 'just enough' > allow space for improvisation and 'cheating'

Matching 'just enough' seeks a balance between anticipating and steering an experience, and leaving free space for open interpretations, aberration and subversion (Figure 3). Providing the minimum necessary cues for an object to be engaging without over-determining the outcome of interactions can stimulate imagination, creativity and improvisation (or lead to frustration).

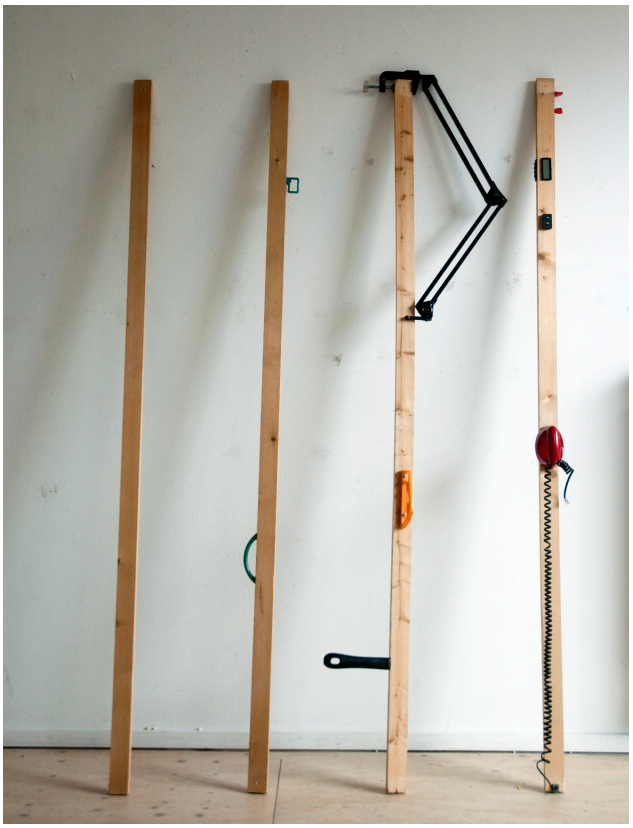

Figure 3. Probes for experiments on formal and semiotic characteristics of objects that may trigger unintentional exploration and improvisation in use. www.unthing.tumblr.com

Conditional / Evolutionary design.

Conditional design is a means to bypass the gap between predicted and actual interactions by creating the conditions for a design to evolve from actual use situations. By designing the minimal conditions necessary to catalyze a process of evolution, user intervention in and reinterpretation of the design is encouraged, as in the Arduino project (Figure 4). The design is never finalized and the role of the designer shifts from author to facilitator.

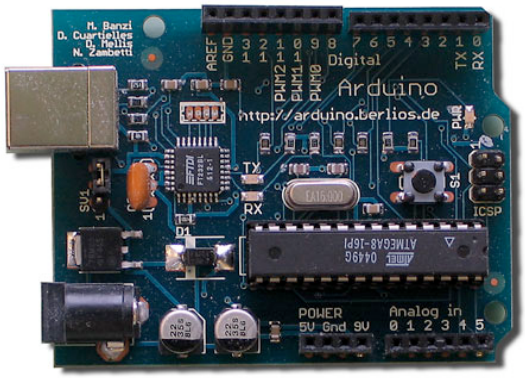

Figure 4. The Arduino. An open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. www.arduino.cc/

CONCLUSIONS

This review study has aligned influential critiques of user-centered design and approaches to product use from the past two decades along a number of themes/key concepts. The analysis reveals that current approaches to usability run the risk of defining users in limited ways and reducing diversity in interpretation of use, thereby limiting space for improvisation.

Other responses to the prescriptive nature of user-centered processes have also arisen in the realm of participatory design processes (e.g. Kuijer, McHardy & Scott,2010).

A review of literature from other disciplines shows that starting points for new approaches can also be found. The starting points are critical design, conditional/evolutionary design and matching 'just enough'. Their potential in expanding interaction design's relevance to design practices has not yet been widely explored. The approaches are expected

to enrich the vocabulary of design practice by borrowing terms (and the sensitivities that come with these terms) from fields such as performing arts, literature and film, to embrace richer concepts of 'experience' and 'pleasure'. The aim is to challenge the design field's preconceptions of 'users' and inspire other designers to rethink how design influences culture.

In his current research, the first author is experimenting with the conditions that foster creative re-purposing of objects and how these conditions relate to semiotic and material properties of objects. The research aims to generate methodology for design practice to embrace the unpredictable complexities of real-life experiences as creative possibilities.

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