

A Simplified Model of User Experience for Practical Application

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ABSTRACT

Today's highly competitive mass markets of interactive products have led to a new perception of product quality by the users and providers of information technology. This new perception goes far beyond the concepts of pure functionality or usability, which are traditionally promoted by software engineering or HCI research. It also incorporates hard-to-grasp concepts from visual and industrial design, psychology, or marketing research, e.g. attractiveness, fun or the successful delivery of a brand proposition. Thus the achievement of this kind of a positive "user experience" (or UX) has become the design goal for numerous interdisciplinary UX teams at world's leading IT manufacturers. However, although the term "user experience" is already widely adopted by practitioners and the industry, there is no scientific consensus on a definition or a theoretical model of UX yet. In this paper we therefore collect different views from scientific and practitioner literature and unify them in a simplified model of UX for practical application and as a theoretical framework for future UX-oriented endeavors.

Author Keywords

User experience, hedonic qualities, pragmatic qualities, value-centered HCI, organizational values, user values

ACM Classification Keywords

H.5.2. User Interfaces. User-Centered Design.

INTRODUCTION

According to Patrick W. Jordan (former head of human factors at Philips Electronics and author of "Designing Pleasurable Products" [9]) many manufacturers see design as one of the few areas, in which significant advantages over the competition can still be gained [9, pp. 2-3]. Hence

it seems not surprising, that the highly competitive mass markets of interactive products are also increasingly sensitive to attractive design, which has become an important product quality for technology customers. This new perception of interactive products goes beyond the concepts of pure functionality or usability, which are traditionally promoted as the crucial qualities by software engineering or HCI research. Today many manufacturers consider their products as interfaces between them and their customers, which mediate much more than just a feeling of satisfaction after successful task completion or dissatisfaction after tasks remained unsolvable [10]. In our age of Pine and Gilmore's "experience economy" [12] products must orchestrate memorable events for the users, which then themselves become the product. Designer Bill Buxton – now working for Microsoft Research – formulates his view on design and experiences as follows: „Despite the technocratic and materialistic bias of our culture, it is ultimately experiences, not things that we are designing.“

In the experience economy people do not buy a brand new fancy mobile phone solely on its superior functionality or usability. They buy the experience of being a part of social and professional life. They buy the experience of being spatially independent and able to plan and communicate spontaneously. They buy the experience of feeling informed anytime and anyplace by novel nomadic applications and information services. They buy the experience of being admired for their trendy but sensible choice of technological tools. And some certainly also buy the experience of being recognized as a technology connoisseur or the member of an urban information avant-garde or elite.

These individual experiences are summed up in a (hopefully positive) total user experience that has become crucial for commercial success today. The often cited Apple iPod MP3 players with a market share of over 90% in the US market are a vivid example, how design and marketing can lead to a positive total user experience that can even compensate serious disadvantages of a product (e.g. higher costs or arguable usability [2]). Such a total user experience therefore incorporates not only the traditional qualities like reliability, functionality, or usability but also novel and hard-to-grasp concepts from visual or industrial design, psychology or marketing research, e.g. attractiveness,

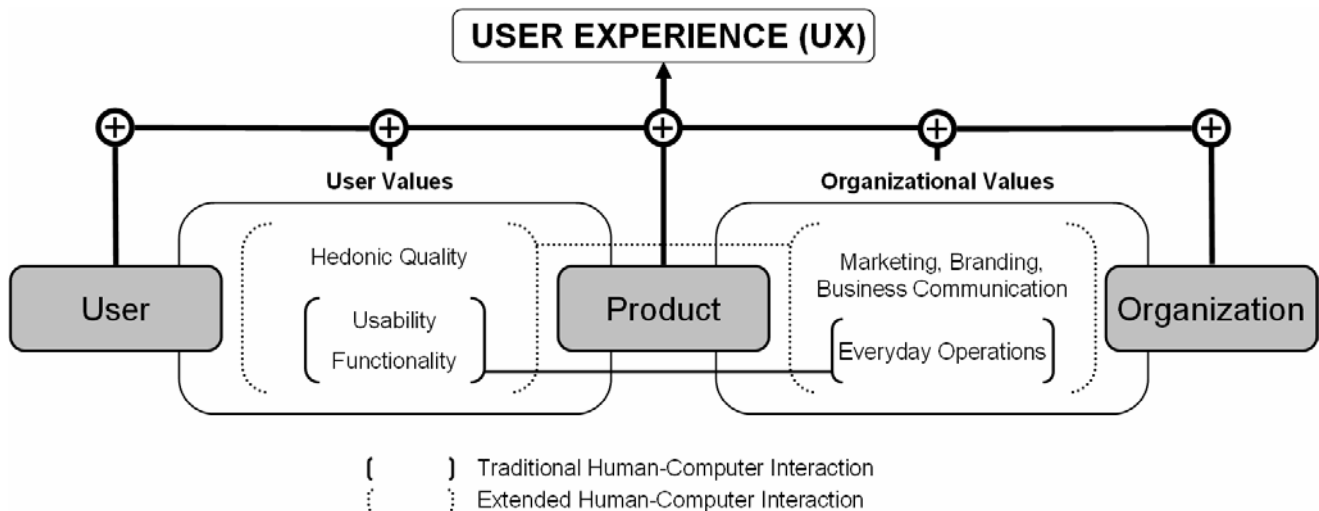


Figure 1. A simplified model of User Experience (UX) clarifying the relation between usability, UX and HCI.

stimulation, fun, “coolness”, “sexiness” or the successful delivery of a brand proposition.

The individual perception of such qualities during use are now generally subsumed in the concept of “User Experience” (or UX), which is of growing popularity among industry and practitioners. Inspired by the concept of the “total user experience” introduced to Apple by Donald A. Norman and Apple’s “User Experience Research Group” [14] in the early and mid-nineties corporations and institutions like IBM, PARC, Microsoft, Nokia or SAP have established numerous interdisciplinary UX groups, research or design departments. In the World Wide Web a growing number of former usability engineers and companies now present themselves as UX experts or UX consulting agencies. Last but not least “UX” will be one of the main topics in Microsoft’s upcoming campaign for the new Windows Vista, which will make this abbreviation spread worldwide in the coming months. Thus a positive UX can be considered as the main goal of user-centered endeavors in the IT industry today and also for the near future.

The Challenge of UX

However, despite its popularity the concept of UX remains a challenge: An industry practitioner browsing the web in search for a definition of UX will be confronted with dozens of conflicting and inconsistent views and terminologies. In many cases “user experience” is simply used as “buzzword” for usability, disregarding the role of all other product characteristics, which are considered substantial by HCI and UX research in the field of “Joy-of-Use” [13], “Emotional Design” [11] or “Funology” [8]. Other authors explicitly exclude HCI and usability from UX and emphasize the importance of marketing, branding and strategic business communication [10]. Although the term “user experience” (and in some cases “user experience engineering”) seems to be widely adopted by practitioners and the industry all over the world, there seems to be no

scientific consensus on a definition, on the scope, or on a theoretical model of UX.

This challenge of UX has historical parallels to the very beginnings of HCI as a discipline. Before usability models were formulated (e.g. in ISO-9241), terms like “usability” or “user-friendliness” were abstract concepts and subsumed a large variety of very complex product properties and features. A controlled iterative design process, which ensures such “user-friendliness” throughout the whole software development, must have appeared utopian at that time. Nevertheless HCI researchers successfully accepted this challenge and have turned Usability Engineering (UE) into reality. Therefore it appears consequential to move HCI research and practice towards UX approaches now, leading to novel quality models, processes and methods, which then may lay the foundation for a “User Experience Engineering” (UXE) in the future.

The growing importance of a holistic perspective of user and product was addressed by Inga Reeps from our research group in [13]. Reeps has discussed different models of “Joy-of-Use” and has suggested an elaborated model in the context of design processes. We have used concepts from her work as a starting point to develop a simplified model of UX as a basis for the practical application of UX in design and evaluation processes, especially aimed at the practitioner. Our aim was to unify the different views from scientific and practitioner literature in a simplified, yet complete and unbiased model, which includes the user-product relationship (mainly discussed in UX literature from the fields of HCI, Joy-of-Use, Funology or Emotional Design) and the organization-product relationship (mainly discussed in e-Commerce or marketing related literature about branding, customer experience or customer relationship management). Our model is not intended to depict cognitive or organizational processes in detail, but to provide a quick overview over influential factors on UX and to illustrate, which influential factors can be addressed

during a design process. In the following section we will introduce this simplified model (see figure 1) and the underlying theories.

A SIMPLIFIED MODEL OF USER EXPERIENCE

Most UX authors agree on the nature of an interactive product as an interface between user and organization. Interactive products (no matter whether a corporate website or information appliances like iPod or Blackberry) are considered as interfaces or touchpoints between a user (customer) and an organization (manufacturer or service provider) [10]. The product tries to mediate the user experience intended by the organization to the user by implementing a certain product design. However, as Hassenzahl points out, the intended experience is not necessarily the perceived experience: “There is no guarantee that users will actually perceive and appreciate the product the way designers wanted it to be perceived and appreciated” [8].

The perception of a product is based on the individual values of the user and the context of use, therefore the perception of user experience is highly subjective. Furthermore in a competitive market the intended experience that an organization wants to orchestrate can not be focused solely on the user. The product and the intended experience must be primarily designed according to the individual organizational values and the organizational context (e.g. the underlying business model). Thus subjective values of all stakeholders (organization and user) play a central role in designing User Experience.

In our model in figure 1 we have therefore emphasized the interface nature of a product and the importance of user and organizational values. In the following we want to discuss the two most important building blocks of our model in more detail: the user-product relationship and the organization-product relationship.

The User-Product Relationship

In the past years different authors in HCI literature have tried to enhance the understanding of quality by introducing concepts like “pleasure” [9], “hedonic quality” [8] or “aesthetics” [15] in order to apply a more holistic view of human needs and values to HCI.

Patrick W. Jordan argues for such an enhancement, because in his eyes purely usability-based approaches tend to encourage the view that users are merely cognitive and physical components of a system consisting of the user, the product and the environment of use. “This is – by implication if not by intention – dehumanizing” [9, pp.7-8]. Jordan therefore promotes “pleasure” as an important product quality and suggests four different types of pleasure that a product can address: Physio-pleasure (i.e. touch, taste, smell or sensual pleasure), Socio-pleasure (i.e. facilitation of social interaction), Psycho-pleasure (i.e. compliance to the user’s cognitive and emotional reactions), and Ideo-pleasure (i.e. compliance to the user’s sense of

aesthetics or ideological values). For Jordan the human need for “pleasure” follows the need for functionality and usability in the “hierarchy of user needs”, thus implying that pleasure entails functionality and usability as necessities and is depending on them.

Don Norman’s model focuses on three levels of “Emotional Design” deduced from cognitive science, which address the corresponding level of human information processing: visceral design (i.e. product appearance), behavioral design (i.e. pleasure and effectiveness of use), and reflective design (i.e. self-image, personal satisfaction, memories) [11].

Regarding the rather abstract nature of the concepts on which Jordan’s and Norman’s models are based on, they appear to be hard to integrate into future UX-oriented design or UXE approaches by practitioners. In our eyes the mapping and application of these models onto design principles or patterns for the physical design of products in industry practice seems to be very challenging.

Marc Hassenzahl has succeeded in modeling the user’s perception of the quality of interactive products in two independent dimensions and suggests a model, which we regard as more applicable in user-centered design: pragmatic quality and hedonic quality [8].

While pragmatic quality (PQ) corresponds to attributes like “clear”, “supporting”, “useful” and “controllable” (or the traditional functionality and usability) hedonic quality (HQ) corresponds to attributes like “outstanding”, “impressive”, “exciting”, or “interesting”, therefore representing qualities which can also be associated with Jordan’s “pleasure” or other non-utilitarian concepts (e.g. “Joy-of-Use”). Hassenzahl regards pragmatic and hedonic qualities as independent of each other, which complies with our personal experience from designing interactive products or observing usability: Usable products are not necessarily appealing. Products with shortfalls in usability or functionality can still be appealing though (Apple’s iPod can serve here as a popular and commercially successful example again [2]).

While the product characteristics that can influence the pragmatic quality are well-known among the HCI and engineering community, those which influence the hedonic quality or pleasure are undefined and manifold: For example Tractinsky & Hassenzahl consider aesthetics as an important aspect [15] and Hassenzahl suggests a consistent and attractive visual design, self-explanation and story telling (like in successful video games) to boost intrinsic motivation of users [7]. Accordingly the design space for hedonic quality reaches from classical visual and industrial design to digital storytelling and novel I/O devices (e.g. tangible interfaces or immersive displays or sound design) and is therefore virtually infinite. However, Hassenzahl’s model offers a framework for orientation within this design space. The hedonic quality of a product is based on the three hedonic attributes “stimulation” (i.e. a product offers

space for personal development), “identification” (i.e. a product communicates the user’s identity), and “evocation” (i.e. a product provokes memories or associations).

Hassenzahl’s model is more elaborated than it is described here and also considers different conditions of use. However, this brief introduction is sufficient to describe the user-product relationship in our simplified model. The user-product relationship is defined by the user, the product and the user values, which are strongly depending on the current context of use (e.g. the user’s tasks and social or physical environment). The relationship is perceived by the user in terms of functionality and usability on the pragmatic level and in terms of hedonic quality on a hedonic level. The user-product relationship is depicted in the left part of our model in figure 1.

The Organization-Product Relationship

To this point we have discussed UX only from a user-centered perspective. However, the web design, e-commerce and customer relationship related literature about UX (e.g. [3], [5] or [10]) emphasizes the importance of an organizational perspective. The relation between organization, organizational values and product is therefore depicted in the right section of our model in figure 1. In contrast to the user-centered perspective on the left, the center of the organization-value-product system on the right does not contain user perceptions, but a two level hierarchy of business processes and goals (“Everyday operations”, “Marketing, Branding, Business Communication”).

“Everyday operations” stand for taking out frequent business operations and implementing the business model in the real world (e.g. selling items on a website, providing communication or information services, offering customer support). These operations lay the foundation of every organization and are closely related with the functionality and usability of a product. The user or customer must be able to take out her intended actions and tasks (e.g. ordering a certain book, payment, requesting support, listening to a certain MP3, sending an e-mail) efficiently and effectively, so basic usability and functionality are always essential.

However, there are higher level goals of organizations like communicating a certain product or brand identity, or establishing an emotional link between the organization, its brand and the user or customer. Today, providing a consistent customer and brand experience throughout all touchpoints or products of an organization is considered a crucial part of marketing and business communication [10]. Delivering such a successful brand proposition requires more than designing solely pragmatic qualities.

For example Fogg & Tseng discuss aspects of web credibility in [4]. The perception of a website as credible (e.g. online banking site) is based on the evaluation of multiple dimensions by the user, which range from the site’s usability and encryption features on the pragmatic level to attractive visual design and typography on the

hedonic level. Hence designing for credibility means designing an intended perception on both levels.

In many cases interactive products for the World Wide Web should not only fulfill their pragmatic core tasks, but should also spread the company’s brand identity as broadly as possible [10]. A minimum requirement for the UX of such a product is the compliance to the brand identity or the brand promise. If a bank’s brand promise is based on claims like “24 hours online!”, “easy-to-use!”, “less bureaucracy!”, and “instant reaction!”, this would conflict harshly with a rather slow banking website with voluminous conservative-looking web decoration, complex navigation and the necessity to print out and mail multiple forms to apply for a credit in a tedious paper-based process.

Sometimes operational or strategic organizational values may even conflict with pragmatic user values. In some cases such conflicts can lead manufacturers to deliberately design certain aspects of products or services hard-to-use or hard to find [10]. In these cases designing UX according to the organization’s intention might lead to designs, which clearly contradict usability heuristics. The consideration of such business and communication goals in an organizational or business environment raises the complexity of UX design and evaluation. It also reduces the role of usability within UX to that of one among many other design goals.

USER EXPERIENCE ENGINEERING

After modeling the relationships between user, product, and organization and emphasizing the importance of both relationships on UX, we can complete the model and discuss its application and consequences:

As becomes clear in figure 1 our model of UX is focused on a variety of user and organizational values and exceeds the traditional perspective of HCI and usability engineering. The enhancement of the scope of HCI from usability to user experience can be regarded as a step towards a new understanding of HCI as Gilbert Cockton has suggested at this conference two years ago [1]: “Traditional disciplines have delivered truth. The goal of HCI is to deliver value.” We share Cockton’s view that “HCI must be objectively systematic and reliable in the pursuit of subjective value.” As a consequence HCI cannot disregard stakeholder values – even though they might be based on hard-to-grasp emotions or business-oriented organizational goals.

“User Experience Engineering” will be an ambitious endeavor. New methods and processes must be developed or imported from other disciplines to (pro-) actively design and evaluate new kinds of product qualities. Existing processes must be adapted to new design goals and evaluation strategies. Nevertheless UXE appears promising: Jordan has suggested different methods from industrial design and marketing research (e.g. Kansei Engineering, Laddering), which could enrich current usability engineering or design processes with hedonic qualities [9]. Hartwig and Hassenzahl have discussed the compliance of

hedonic qualities with quality control processes and are positive about the achievement of “certified fun” [6].

However, a question that remains open is how to deal with conflicting organizational and user values as described in the previous section. UXE will have to handle such conflicts and will have to answer the question, which values to prefer when.

User vs. Organizational Values

Unlike usability UX incorporates a complex variety of potentially conflicting user and organizational values. Since trade-offs are therefore inevitable, there is a need for evaluating the consequences of a design decision. Was the decision “good” or “bad” for UX? This question is not easy to answer, as soon as multiple values of different stakeholders are affected simultaneously by a decision.

In our eyes “good UX” means a “successful UX” in terms of Karen Donoghue [3]: „A successful user experience creates an elegant equilibrium between delivering value for customers and value for the firm.” Accordingly, it is the task of UXE to create and to keep such an equilibrium.

Typical examples for the domination of organizational values over user values are the absence of usability engineering because costs are feared or the reduction of usability to foster a certain brand experience or certain products. For example many mobile phone providers offer their customers phones, in which the original interface and interaction design of the phone manufacturer was replaced by a customized design for the mobile phone provider. Apart from prominent company logos and changed color sets, these designs often have changed orders of menu items or assignments of keys to promote more expensive MMS over SMS services, or to provoke unwanted internet connections. On websites the “brand design” can lead to less usable sites, for example through removing underlining from hyperlinks for brand design reasons or breaking with other web conventions.

Domination of user values over organizational values is less frequent. An example mentioned by Donoghue is the Napster filesharing system, which was hugely popular due to its value for the user but lacked a viable business model (at least in its early stages) [3]. Kuniavsky mentions the case of the website of an airline where the usability of an offered service to the customers was deliberately reduced to prevent too frequent usage because of the resulting costs. The usability was “too good”.

CONCLUSION & FUTURE WORK

We have introduced “user experience” or UX as a key quality of interactive products on today’s competitive mass markets. We have identified key elements of UX from existing literature and clarified its relation to traditional qualities like usability or functionality. With our simplified model of UX we provide an overview of the user-centered and organizational perspective as a basis for communication and practical application. Furthermore we

have discussed potential conflicts between user and organizational values within “User Experience Engineering” endeavors.

In our eyes the goal of future work should be to develop and import new design and evaluation methods based on interdisciplinary knowledge from related fields such as industrial design, media design, game design, brand management, or market research. With this increased knowledge, it will be possible to adapt or create new design processes, which extend the traditional pragmatic perspective of usability engineering and could form the basis for an UXE. A successful implementation of a user experience engineering process would not only strengthen a manufacturer’s position on competitive markets, it would also lead user-centered design approaches and HCI research to a significantly greater importance in industry practice. The holistic concept of UX seems to be more attractive than traditional usability for many organizations. Therefore we do not consider UX as a “competitor” for traditional usability, but as the perfect vehicle (or even Trojan horse?) to leverage user-centered design and usability to a greater extent and thus strengthening the importance of UX and usability likewise in industry practice.

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