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User Experience (UX): Towards an experiential perspective on product quality

Marc Hassenzahl

University of Koblenz-Landau, Germany
Media City, Åbo Akademi University, Finland
www.marc-hassenzahl.de

ABSTRACT

User Experience (UX) is not just "old wine in new bottles". It is a truly extended and distinct perspective on the quality of interactive technology: away from products and problems to humans and the drivers of positive experience. This paper will present my particular perspective on UX and will discuss its implications for the field of Human-Computer Interaction.

CATEGORIES AND SUBJECT DESCRIPTORS: H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

KEYWORDS: User Experience (UX), User-Centred Design, hedonic quality, well-being

INTRODUCTION

Adapting technology to human nature is the key concern of Human Factors, Ergonomics, Human-Computer Interaction and Usability Engineering. However, "nature" was often viewed narrowly in terms of perceptual and cognitive processes and the ability to perform with efficiency. Definitely in line with organizational goals, this renders humans as "homines oeconomici", who merely value technology as a tool to gain time to do whatever is concerned pleasurable. Recent discussions, however, raise the point that technology use in *itself* can be a source of pleasure. Merely accomplishing externally given tasks may be a too limited view of what people do with and gain from technology: Insight, pleasurable stimulation, social exchange are the true underlying motives for technology use; feelings and experiences its true outcomes.

Many of these notions are subsumed under the umbrella of User Experience (UX); however, a widely accepted, shared understanding of UX is still lacking. But we need such an agreed-upon understanding. This is due to the wide gap between practitioners and academics in their understanding of what UX actually is. While UX seems ubiquitous in industry, a closer look reveals that it is treated mainly as a synonym of usability and user-centred-design (e.g., [21]). Academics, however, emphasize the differences between traditional usability and UX (e.g., [8]). The question at hand is whether UX is just

"old wine in new bottles" or a truly extended and distinct perspective on the quality of interactive products?

Maybe driven by a need to clarify this, standard experts currently attempt to integrate UX into the respective ISO standards' next revision [1]. ISO CD 9241-210 tentatively defines UX as "all aspects of the user's experience when interacting with the product, service, environment or facility. [...] It includes all aspects of usability and desirability of a product, system or service from the user's perspective" [19]. This "definition" has at least two problems: First, "all aspects" may be a phrase easily agreed upon, but if so, not because of its clarifying quality. It is rather an empty shell, ready to be filled with whatever one finds important – this may avoid debate, but is clearly too vague to be helpful. Second, it introduces "desirability" – a term, which may produce rather questions than answers.

So what is UX? To answer this is the main objective of this paper. To my mind, a definition should have two parts: one that defines UX in itself and a second that states how UX is "made." Let's start with UX itself.

UX ITSELF

Experience itself is an ongoing reflection on events, we currently go through or as Forlizzi and Battarbee [6] put it: a constant stream of self-talk. As long as we are not interested in experience *per se* but in experience in relation to interactive products, these events are instances of human-product *interaction*. Events stretch over time, with a definite beginning and end. They have a temporal dimension. The self-talk itself can be qualitatively rich, but must not necessarily be so. However, one element that will always be a part of experience is a momentary feeling of pleasure and pain in various intensities [11]. This constant "good-bad"-feeling regulates our behavior. Throughout an event, we can probe and ask ourselves "How good or bad do I feel at the moment." This is, for example, the basis for going on or quitting a particular event (i.e., behavior). Moreover, this feeling is the common "psychological currency" that allows for comparing qualitatively different experiences [16]. And it is a central basis of subjective product evaluation (e.g., [9]).

Consequently, I define UX as a *momentary, primarily evaluative feeling (good-bad) while interacting with a product or service*. By that, UX shifts attention from the product and materials (i.e., content, function, presentation, interaction) to humans and feelings – the subjective side of product use. In addition, it emphasizes the dynamic. UX becomes a temporal phenomenon, present-oriented and changing over time. Note that the present-orientedness does not exclude summary retrospective (e.g., "all in all, the party last night was good") or prospective judgments about experiences (e.g., "The party tonight will be good"). But the primary object of judgment remains the stream of passing momentary feelings.

There is a wealth of challenges related to this definition. The focus on the subjective poses the question for evaluation of how to get into the "heads" of people while they interact with a product? How can we track UX over time? How to evaluate single outstanding "moments"? How to integrate moment-by-moment-feelings into a cumulating feeling (and later attitude) towards the product? Some of these challenges have direct methodological consequences for practical evaluation, others are of more general interest.

Note, however, that this definition (or many others proposed so far) does not answer the most critical aspect of UX, namely, the question of the *origin of the positive or negative feeling*. So, how is a positive UX "made"?

ORIGINS OF UX: DO-GOALS AND BE-GOALS

I [7] assume that people perceive interactive products along two different dimensions. *Pragmatic quality* refers to the product's perceived ability to support the achievement of "do-goals", such as "making a telephone call", "finding a book in an online-bookstore", "setting-up a webpage." Pragmatic quality calls for a focus on the product – its utility and usability in relation to potential tasks. In contrast, *hedonic quality* refers to the product's perceived ability to support the achievement of "be-goals", such as "being competent", "being related to others", "being special" (see [4] for more on do-and be-goals). Hedonic quality calls for a focus on the Self, i.e., the question of why does someone own and use a particular product. Here, more general human needs beyond the instrumental come into play, such as a need for novelty and change, personal growth, self-expression and/or relatedness (see [15, 17, 18] for various lists of human needs).

I argue that the fulfilment of be-goals (i.e., basic human needs) is the driver of experience. Lack of usability might impose a barrier to the fulfilment of active be-goals, but it is in itself not desired. What is desired is to fulfil be-goals such as being autonomous, competent, related to others, stimulated, and popular through technology use. If people experience fulfilment of be-goals through a product, they will attach hedonic attributes to

it. In turn, perceived hedonic quality will be an indicator for potential fulfilment of be-goals through interaction with the product.

Thus, the second part of my definition of UX states: *Good UX is the consequence of fulfilling the human needs for autonomy, competency, stimulation (self-oriented), relatedness, and popularity (others-oriented) through interacting with the product or service (i.e., hedonic quality). Pragmatic quality facilitates the potential fulfilment of be-goals.*

Hedonic quality, thus, contributes directly to the core of positive experience. Pragmatic quality does so only indirectly via making fulfilment more easy and likely. But in itself, usability is of no value. It gets its value through facilitating the pursue of meaningful be-goals.

Note, that a concept like the – at least in the context of interactive games – popular "flow" (e.g., [5]) is very close to the present ideas. Briefly, flow is a positive experience caused by an optimal balance of challenges and skills in a goal-oriented environment. In other words, flow is the positive UX derived from fulfilling the need for competence (i.e., mastery); it is a particular experience stemming from the fulfilment of a particular be-goal.

A potential critique of the present model is that it neglects cases where people seem to focus on the quality of the experience itself and not so much on be-goals to be attained. Especially leisure activities doesn't necessarily seem to be motivated by much more than the simple wish "to relax" or "to feel good". Of course, people in a bad mood may seek to "repair" their mood [10] through, for example, a particular activity (e.g., sports, meeting friends) or consumption (e.g., watching a movie, eating chocolate). Here the positive experience *per se* appears to be the goal of the activity. Nevertheless, the positive experience must still be derived from something. Taking predominantly visceral sources aside (e.g., the biochemically induced mood-improving consequences of eating chocolate), the fulfilment of be-goals remains the ultimate source of positive experiences. In this sense, it may not matter much whether we engage in an activity with the primary intention to "feel good" or "to fulfil our need for relatedness" – the positive experience still stems from fulfilling a basic psychological need. Indeed, one has to keep in mind that the pursue of be-goals may be rather implicit and automatic [4]. Thus, the actual experience, the positive feeling, is much more graspable than its underlying reasons. Based on this, it seems more than natural that people form requirements for their experiences ("I want to feel good", "I want to relax") rather than explicit be-goals. Nevertheless, the experience is "made" through the fulfilment of be-goals.

THE DESIGN PERSPECTIVE

From a design perspective, a highly interactive product should support the accomplishment of do-goals; however, without a clear proposition of hedonic quality a product remains pallid. So far, a prominent strategy is to put something "useful" (read: functionality) into a beautifully designed box. However, UX can be more conceptual, by for example, designing search functionality, which allows for discovery (to fulfil the need for being stimulated) rather than a keyword-directed search. In general, designers must clarify and keep the underlying be-goals in mind when designing (e.g., "making a telephone call to feel related to another person" as opposed to "making a telephone call to be pleasurably stimulated"). They have to repeatedly re-focus on the experience to be created.

An example for such an approach is the work on technology-mediated intimacy (e.g., [12]), where intimacy is not treated as yet another form of generic communication, but as something following its own set of rules. Of course, one can experience an intimate telephone call with any available phone. A true UX perspective's objective, however, is to take the underlying needs seriously and to design technologies that match those needs. To do so, it is helpful to keep in mind that each need (i.e., be-goal) may call for a particular technique to support its fulfilment. For example, "randomness" is clearly linked to being stimulated. Randomness is a mechanism able to provide surprises and new starting points for further exploration (and thus a resource for design). The resulting experience is in the best case "serendipity" [14], nothing a usability-oriented approach to design could create.

ONGOING RESEARCH: THE STRUCTURE OF POSITIVE EXPERIENCES

After having laid out my general understanding of UX, this section will provide an example of the research, I'm currently involved in.

In a study aimed at exploring the structure of positive experiences with technology, Sarah Diefenbach and I asked participants (N=52, 7% female, median age=23, min=17, max=41) to think of a recent, very positive and satisfactory experience with a technology. We then asked them to further specify this experience with the help of a questionnaire. This questionnaire contained nine items to measure the occurrence of three core human needs taken from Self-Determination Theory: autonomy, competence and relatedness [17]. Example items are "During this experience, I felt that my choices were based on my true interests and values" (autonomy), "... that I was taking on and mastering hard challenges" (competence) and "... close and connected with other people who are important to me" (relatedness). The items were adapted from Sheldon and colleagues [18]. Each need was measured with three items. The reliability was good (Cronbach's $\alpha > .70$, see Table 1, column 2), thus, scale values were computed for each need by

averaging the respective three items. The correlation between scales was in the range from .02 to .44. Although in part substantial, the intercorrelations were still low enough to consider the three needs as independent constructs. (A principal components analysis with orthogonal rotation supported this view.)

Table 1, column 3, shows the mean salience of each need in the reported experiences: Competence was the most salient, followed by autonomy and finally relatedness.

	Reliability (α)	M (SD) (Scale 1-5)
competence	.83	3.13 (1.17)
autonomy	.81	2.88 (1.12)
relatedness	.93	2.42 (1.36)

Table 1 : Reliability of the need scales, salience of the need (mean, standard deviation)

Participants further rated their feelings during the experience with the German and abridged version of the "Positive And Negative Affect Schedule" (PANAS, [13, 20]). This questionnaire consists of five positive and negative affective states (see Table 2, column 1). Participants rated the intensity of each particular affective state during the experience on a five-point scale (*not at all – extremely*). Table 2 shows the correlations between the intensity of affective states and the saliency of needs while using the technology.

	competence	autonomy	relatedness
inspired	.28*	.32*	.16
alert	.30*	.37**	.20
excited	.11	.19	.20
enthusiastic	.04	.15	.09
determined	.50**	.42**	-.17
afraid	.15	-.01	-.04
upset	.25	.27	.22
nervous	.36**	-.02	.04
scared	.28*	.15	.25
distressed	.10	.11	.30*

Table 2 : Correlation (Pearson's r) between intensity of affective state and saliency of need, * $p < .05$, ** $p < .01$

Autonomy was solely linked to positive affect, specifically to feeling inspired, alert and determined. Competence showed a similar pattern, however, its experience was also accompanied by feeling nervous and scared. Relatedness was not significantly correlated to positive affect. In contrast, people who felt a certain relatedness also felt distressed.

This exploratory study shows that experienced autonomy and competence is a source for positive experiences while using technology. Relatedness played only a minor role and was not related to positive affect. I argue this to reflect a shortcoming of available technologies rather than the unimportance of relatedness as a need.

Technology is just not designed with social needs in mind. Indeed, only eight of the 52 experiences described by participants mentioned other people or a "social" situation.

There is another interesting point demonstrated by this study. Different needs produce different qualities of affective experience. Competence, for example, produces a mixed experience, with a positive activation and a negative fear of failure. However, none of the core needs favoured by Self-Determination Theory (SDT, [17]) seems to produce the qualities so often referred to in the context of UX: excitement and enthusiasm, that is, joy. In fact, SDT is from a tradition of humanistic, eudaimonic theories of well-being (just as the "flow"-theory). Those theories have a normative stance. They seek to separate "good" from "bad" pleasures, "virtues" from "vices". However, as we all know, indulging in vices may not be the most healthiest, but it can be definitely fun, which calls for at least two different notions of fun (see [2] for a discussion of "pleasure" versus "fun").

Future studies will broaden the palette of needs at least to "pleasurable stimulation," and "popularity / influence over others", to test whether these are able to produce the lacking facets of positive affect (i.e., excitement and enthusiasm). This will be a direct test of my model of UX.

CONCLUSION

This paper presented my personal view on UX and related phenomena and research. Instead of providing a one-size-fits-all-definition of UX, I emphasize its subjectivity, present-orientedness and dynamics, and the central role of pleasure and pain. In addition, I provided an approach to explain, where the pleasure and pain comes from, namely from the fulfilment of basic human needs.

A common critique of my approach (and similar accounts) is its seemingly reductionistic manner – it tries to reduce "complexity and richness of user experience [...] to a set of manipulable and measurable variables." It imposes "abstract models and classifications onto rich and complex concepts like affect and emotion" ([21], p. 68; see [3] for a similar argument).

I believe this critique to be unjustified. It assumes a richness in experience, which might not be that ubiquitous in everyday life. In addition, rich accounts of experience might require an outstandingly reflective and attentive "experientor." I suspect experiences with technology (as many other experiences as well) to be far less unique and far less variable as implied by the proponents of the "phenomenological" approach: we all like to be challenged; we all like beautiful things, we all care about what others think about us and we all like romantic sunsets. Accounts of according experiences might differ in

their quality, the experience itself does not. A poet may find beautiful words to describe her experience, this does not make it superior to what more mundane people experience.

Designing a product requires a detailed understanding of the people and the context it is designed for. In addition, designers need inspiration. They are able to build ideas from anecdotal observations and loose associations. Certainly, a phenomenological-oriented approach and method is better able to provide this. However, it is less good in giving applicable criteria to guide design and evaluate resulting products. Take marriage counselling as an example. I'm sure that the problems couples encounter and the actual experiences they make in their relationship, are rich and diverse. A thorough understanding of it is necessary to pick appropriate approaches to, for example, solve marital problems. However, this also requires a more general understanding of what intimate relations have in common, and how classes of marital problems should or shouldn't be approached. The latter is a reduction – the result of many people trying to understand this problem domain; the distillate of hours and hours of counselling work. No seasoned practitioner or researcher would dismiss this knowledge and would argue to start afresh each time just because otherwise one would not do justice to the complexity of an intimate relationship. In the context of interactive products, I argue for both: understanding the particularities of the product and context at hand (maybe through a phenomenological approach) and using the already cumulated knowledge available through, admittedly, reduced, but proven models.

UX is becoming more and more important. A wealth of models to describe the nature of UX is already suggested and more will follow. A closer look reveals striking similarities among the models and less conflict about core attributes of UX than one would expect. All have at least one thing in common: They focus on well-being and not performance as an outcome of human-product-interaction. And this is the common denominator of all UX work.

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