

User Experience from Product Creation Perspective

Virpi Roto

Nokia Research Center

P.O.Box 407, 00045 Nokia Group, Finland

virpi.roto@nokia.com

ABSTRACT

This paper describes some viewpoints for user experience from a large corporate. Nokia manufactures mobile devices, towards which people often have strong emotions, so user experience is highly valued inside the company. Nokia has a long history in designing for, evaluating, and managing user experience, and is well aware of the challenges in these activities. It is relatively easy to investigate UX with existing products, but it is much harder to investigate UX with an early concept idea or a single new feature that does not actually work yet. It requires understanding the fundamentals of user experience.

REFLECTION SECTION

As user experience (UX) covers many research fields, and each discipline has different viewpoints to UX, shortly explaining my route to UX research hopefully helps to understand my viewpoints in this workshop. I come from HCI field, with computer science education but a long career in usability of software and hardware systems. My main motivation is to make user experience easy to manage in a product creation process, so that customers would be happy and loyal users of the resulting products. I am also hoping to include value of an experience (Cockton 2006) inside the definition of user experience, as it is the long-term value of the system that makes our customers loyal.

I grew confident for the need of user experience years ago, starting from the design perspective: some people just love their gadget because of its industrial design. They do not care too much about usability, as long as the look pleases them. Second, in long-term field studies, we often notice users give feedback about social and emotional aspects, not only about utility and usability of the tested system. Third, when conducting user needs studies in contextual inquiry manner, the findings point us to needs that are well beyond efficient task accomplishment. Why a family man prefers a mobile phone to a PC for browsing the Internet at home? Why do we see so many fancy phones on the tables of a popular Indian café? I have examined the theories behind UX in my PhD thesis (Roto 2006), and since then I have been working e.g. on the UX elements that help in UX evaluation. Understanding the underlying user needs, both pragmatic and hedonic, is the key in providing good systems for customers and thereby in business success.

PRINCIPLES

Before we can gain a common understanding about UX and make science out of it, we should be able to formulate a definition that everyone can agree on. There are a number of UX definitions out there; below a few of them.

“All the aspects of how people use an interactive product: the way it feels in their hands, how well they understand how it works, how they feel about it while they’re using it, how well it serves their purposes, and how well it fits into the entire context in which they are using it” (Alben 1996)

“The overall experience, in general or specifics, a user, customer, or audience member has with a product, service, or event” (Shedroff, online). Shedroff defines experience separately as “the sensation of interaction with a product, service, or event, through all of our senses, over time, and on both physical and cognitive levels”.

“Every aspect of the user's interaction with a product, service, or company that make up the user's perceptions of the whole”. (UPA 2006)

“All aspects of the end-user's interaction with the company, its services, and its products.” (Nielsen-Norman group, online)

“The overall experience and satisfaction a user has when using a product or system.” (Wikipedia, online)

“A result of motivated action in a certain context.” (Mäkelä & Fulton Suri 2001)

“A consequence of a user’s internal state (predispositions, expectations, needs, motivation, mood, etc.), the characteristics of the designed system (e.g. complexity, purpose, usability, functionality, etc.) and the context (or the environment) within which the interaction occurs (e.g. organisational/social setting, meaningfulness of the activity, voluntariness of use, etc.)” (Hassenzahl & Tractinsky 2006)

Subjectiveness: Few definitions communicate even the very fundamental fact that user experience happens inside the person. Lesson one in differentiating user experience from usability is to understand that usability is a product attribute but user experience is personal, subjective feeling

about the product. A good definition would explicitly say what kind of mental state user experience is, e.g. a sensation, feeling, emotion, emotional bonding, or attitude. This depends on how momentary and instantaneous we see UX is.

USER experience: Many researchers do not want to talk about user experience but plain experience (e.g. Forlizzi & Battarbee, 2004) so the definition should state how *user* experience differs from experience.

- User experience involves a product/service (or a system in general), whereas experience does not require it. Watching a sunset is an experience, not user experience.
- User experience involves interacting (or the possibility to interact) with a system at some point, whereas ‘experience’ does not require it. Smelling, or even seeing, neighbor’s cake is an experience, not user experience, until the neighbor invites you to take a piece.
- It is debatable if eating the cake creates a user experience or just an experience: am I a ‘user’ of the cake? I claim we can talk about user experience whenever there is interaction with a product, even though the product is not interactive. A cake does provide user experience, because I interact with it: I touch the cake and feel how soft it is, and biting the cake gives delicious taste as ‘feedback’. That is how I interact with the cake.

Expected UX: Before a person starts to interact with a product, she has expectations for it. The smell and look of the cake gives her the first idea about the cake, and neighbor’s description of the cake adds detail to the expectations. But until the interaction starts, we cannot talk about user experience. Similarly, we cannot talk about user experience right after seeing an advertisement of a product. I call the experience before actual interaction as ‘expected user experience’, not user experience (Fig 1). Brand image, other people’s opinions, advertisements, test reports, and earlier experiences with similar products form the expectations. The expected UX plays a key role when the actual user experience takes place, as the person will evaluate the goodness of UX against the expected UX. From the moment when the product gives feedback to user’s action, through whichever sense, we can start to investigate UX.

Beyond interaction: Most UX definitions claim that UX takes place while interacting with the product. This means UX is seen as a momentary emotion, and so, can be evaluated with psycho-physiological measurements. Although I see the importance of these measurements for highly experiential products such as games, I think the interaction focus is a too narrow view to user experience. My user experience with a shirt changes when I read that a pop star wears the same shirt, or when my friend says the

shirt manufacturer exploits child labor. So, product user experience changes even when I am not interacting with the product, but just get new insights about it or its manufacturer. From the industry perspective, it is the long-term user experience that matters in business success, not a momentary emotion that might, in the end, be meaningless to the user. I see Overall UX to consist also of the phases outside interaction (Fig. 1). According to these lines, UX is the attitude and emotional bonding towards a product, rather than a transient emotion during interaction.

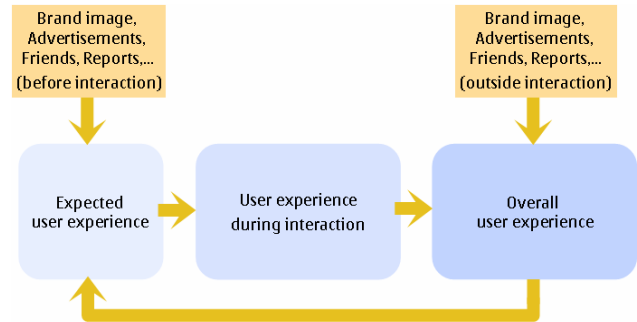


Figure 1. Phases of UX

During interaction: Although UX happens also outside the interaction phase, interaction is definitely an important phase to affect product UX. Investigating the interaction phase is important in order to improve a product, as there we see which features and components create good UX and which do not. To understand UX during the interaction phase, we need to see the effect of the three components to UX: user, context, and the system being used (Hassenzahl & Tractinsky 2006). To improve product UX, our focus is on the system component. Still, context and user cannot be forgotten, but in order to provide the best UX, the system should adjust to the current context as well as to user’s current needs and expectations.

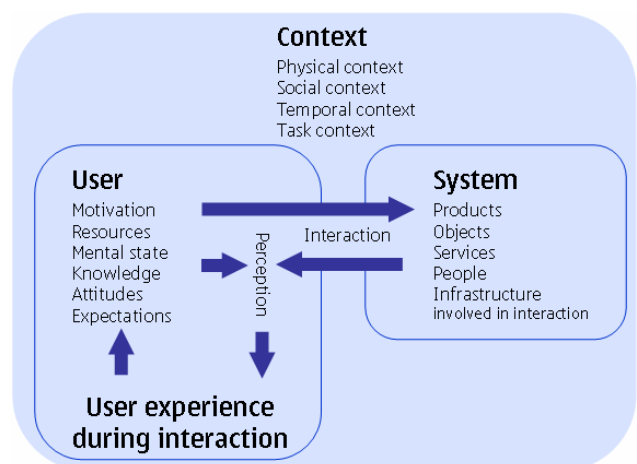


Figure 2. UX during interaction

Granularity: As discussed already above, we can analyze UX on different granularity levels. An example of a detailed granularity level is the UX of a single key click, e.g., was the key easy to press; was the tactile, auditory, and visual feedback pleasurable? A higher level of granularity is a use case: did the user achieve what he wanted by using the system the previous time, and did s/he enjoy that use case? On the highest level, we can investigate the relationship between the product and the user, even after s/he has replaced the product with a new one. All these different granularity levels provide useful information about UX, and can be used for different purposes. If we want to improve a specific product detail, we can create several alternative designs of that detail and apply the smallest granularity level to evaluate the different designs. If we want to understand which features work well for different users in different contexts, we apply the use case analysis level. If we want to understand the value and importance of a product to the user, we apply the overall relationship level. It is interesting to study how the smaller user experiences correlate with the overall UX.

Measurability: Although UX is a complex concept, it must be measurable on the different granularity levels and on the different phases of UX lifecycle (Fig 1). It would be beneficial to have a set of UX elements that apply to all kinds of interactive products/ services and could be used to measure if a product/service provides good user experience or not. This helps running UX evaluations routinely with an agreed, standard set of attributes and thereby see trends and differences between different products. We should pick 4-8 elements, both pragmatic and hedonic (Hassenzahl 2003), to describe the measurable characteristics of UX with all kinds of products and services. More elements can be added to different product categories as needed. I propose to include the following elements:

- Utility – does the product serve its purpose
- Usability – is the product easy to use
- Enjoyment – is the design & interaction enjoyable
- Pride – is the user proud about the product

POLICY

In this chapter, I examine how UX relates to usability, technology acceptance models, and worth-centred design.

I see usability to form one part of UX, although the objective measures of usability, such as number of errors and time to complete a task are irrelevant for UX. UX covers the subjective parts of usability only, so a large part of efficiency is outside UX (Fig 3), as it is dependent on *user's perception* about how effectively he could reach the goal.

Technology acceptance models concentrate in the early phases of UX lifecycle: the expected UX and the UX in the first times of interaction (see Fig. 1). The focus is in the phase where a person either starts to use a system or not, so the acceptance lifecycle stops to the point where the user

accepts the system and starts to use it actively. In contrast, UX starts only from the first interaction phase, and continues as long as the user remembers the product.

Acceptance does not necessarily mean good UX. A user may accept a technology just because there is no better technology available to fulfill a need. The user experience may be poor even if the user starts to use a technology. While the components in technology acceptance models are also relevant for UX, UX consists of something more, e.g. of pleasure or joy.

The discussion about the scopes of usability, acceptance, and UX should be broadened to include the scope of worth-centered design (Cockton 2006). I think the current UX research does not take the value aspect seriously enough, but just expects that each experience is meaningful for and wanted by the user. I would like to extend the term UX to include worth (Fig 3).

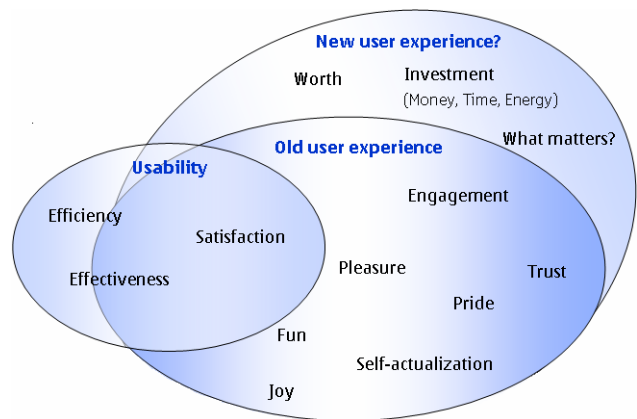


Figure 3. The scope for UX

Should UX be standardized? A commonly agreed and shared UX definition is important for teaching, researching, and managing UX. Having UX standardized would help in the short run, but we would be tied to the standard for the rest of our lives. This might be dangerous for the developments of UX. If we know enough of UX to standardize it, I do not object. Still, this is Internet age, and things are changing rapidly. Could we live with an online definition, and have it available for public in Citizendium.org (reliable, new version of Wikipedia)?

PLANS

Many of the user-centered design (UCD) methods are applicable also to UX design. The design should start by user needs study, that is, by investigating users in real context. There are many ethnographic methods that investigate user needs in their normal setting, including Contextual Inquiry, Spying, and Online ethnography. Based on the user needs, we can derive the design drivers (or UX targets) and more specific requirements for a feature or a product.

As in UCD, iterative design and evaluation should form the key for the process, but evaluating UX in the very early phases of product creation is tricky. As UX is dependent e.g. on the expectations, motivation, and context, it is often hard to get user feedback on an early concept. Is it possible to evaluate just one part of the system when the other parts are not in place yet? The earlier we want to evaluate UX, the lower granularity level we need to choose. UX evaluation in the early phase of product creation process requires more research.

Once the product is on the market, it is beneficial to evaluate UX with people who have taken the product into use of their own free will. These users have had their expectations and motivation to invest into the product, so this is the most reliable phase to investigate UX. The granularity level for the UX evaluation is rather high here, and quantitative methods like questionnaires work fine in this case. Of course, it is too late to improve the product at this point, but the findings can be used for the coming product versions.

CONCLUSION

In this paper, I have stated my perspective to UX, which is influenced by my background in usability and by my work in a large corporate that manufactures mobile devices. I am interested in the model of UX from the product creation perspective, and the psychological aspects inside the user are not in my competence, unfortunately. I noted that UX involves interaction, and discussed how expected UX and long-term UX relate to UX during interaction. This temporal dimension of UX is important to see especially when evaluating UX. Another dimension is the granularity level of UX: Overall UX consists of many smaller experiences. Just averaging the small experiences to the overall user experience would be too simplistic, as some experiences are the more meaningful, or valuable, in forming the overall UX than others. Foreseeing the importance of different small experiences would help in evaluating UX as early as possible in the product creation process.

REFERENCES

1. Alben, L. 1996, Quality of Experience: Defining the Criteria for Effective Interaction Design. *Interactions*, 3, 3, pp. 11-15
2. Cockton, G. (2006). Designing worth is worth designing. In *Proceedings of the 4th Nordic Conference on Human-Computer interaction: Changing Roles* (Oslo, Norway, October 14 - 18, 2006). ACM Press, New York, NY, 165-174.
3. Forlizzi, J., Battarbee, K. 2004, Understanding Experience in Interactive Systems. Proceedings of DIS2004, August 1-4, 2004, Cambridge, USA.
4. Hassenzahl, M., 2003. The thing and I: understanding the relationship between user and product. In M. Blythe, C. Overbeeke, A. F. Monk, & P. C. Wright (Eds), *Funology: From Usability to Enjoyment*, 31-42. Dordrecht: Kluwer.
5. Hassenzahl, M. & Sandweg, N., 2004. From Mental Effort to Perceived Usability: Transforming Experiences into Summary Assessments. In *Proceedings of the CHI 04 Conference on Human Factors in Computing Systems. Extended abstracts*, 1283-1286. New York: ACM.
6. Hassenzahl, M., Tractinsky, N. 2006, User Experience – a Research Agenda. *Behaviour and Information Technology*, Vol. 25, No. 2, March-April 2006, pp. 91-97.
7. Mäkelä, A., Fulton Suri, J. 2001, Supporting Users' Creativity: Design to Induce Pleasurable Experiences. *Proceedings of the International Conference on Affective Human Factors Design*, pp. 387-394
8. Nielsen-Norman Group, Our Definition of User Experience. <http://www.nngroup.com/about/userexperience.html> (28.6.2007).
9. Roto, V. 2006. Web Browsing on Mobile Phones – Characteristics of User Experience. Doctoral dissertation, Helsinki University of Technology. http://research.nokia.com/people/virpi_roto/dissertation.html
10. Shedroff, N. An Evolving Glossary of Experience Design, online glossary at <http://www.nathan.com/ed/glossary/> (23.5.2006).
11. UPA (Usability Professionals' Association): "Usability Body of Knowledge", <http://www.usabilitybok.org/glossary> (23.5.2006).
12. Wikipedia, User Experience Design. http://en.wikipedia.org/wiki/User_experience_design (28.6.2007)