



Being and doing

A perspective on User Experience and its measurement

People own interactive products because they have things to do – making telephone calls, composing and sending emails, writing articles or buying books online. A product's ability to satisfy those *do-goals* with ease is a matter of product usability and utility – quality aspects at the heart of practical and academic Human–Computer Interaction (HCI).

Despite the undisputed importance of usability and utility, one should not forget that people do things for underlying reasons. Calling your spouse while away from home may satisfy completely different needs compared to giving advice to a new business partner. Picked from a Top Ten of psychological needs (Sheldon et al., 2001), the former may satisfy 'relatedness', i.e. a sense of being close and connected to others, whereas the latter may rather satisfy 'influence', to be a person whose advice is sought out and followed. It is a part of our identity, our selves, to strive for the fulfilment of underlying psychological needs. Being related, being influential, being competent, being autonomous – these are all *be-goals*, ways we want to be.

Do-goals, be-goals and the User Experience

One way to approach the concept of User Experience (UX, see Hassenzahl & Tractinsky (2006) for an overview) is to understand it as addressing needs beyond the mere practical level, i.e. doing. In other words, UX differs from traditional usability with respect to its focus on both do-goals and be-goals. Of course, do-goals and be-goals are related. Carver & Scheier (1989) suggested a hierarchy, with do-goals being derived from be-goals and do-goals being in turn instrumental for the accomplishment of the according be-goal. To give an example: being away from home, a need for relatedness might create the wish to talk to one's spouse, which can fortunately be satisfied by a mobile phone. In turn, having made the telephone call not only fulfils this particular do-goal, but also the higher order be-goal of 'being related'.

A model of pragmatic and hedonic quality perceptions

In the context of HCI and UX, Hassenzahl (2003) suggested that interactive products are perceived by their users/owners with regard to their capability to fulfil do-goals (i.e. their pragmatic quality) and be-goals (i.e. their hedonic quality). In other words, product attributes related to usability, such as 'easy', 'predictable', or 'clear', signal the potential fulfilment of particular do-goals and linked be-goals, whereas attributes, such as 'cool', 'beautiful', or 'original', signal direct fulfilment of be-goals. Studies (e.g. Hassenzahl et al. 2000; Hassenzahl, 2004) show that people perceive pragmatic and hedonic aspects as independent of each other. Thus, people may perceive products as primarily hedonic (a be-product), primarily pragmatic (a do-product), both or even neither hedonic nor pragmatic. In addition, both aspects are related to the general evaluation of products, although their importance may vary with the situation.

Beauty in products may be viewed as an unnecessary luxury. But imagine using an ugly product every day.

Some implications of the model

The concept of hedonic and pragmatic quality perceptions, which link product attributes to a hierarchical system of do-goals and be-goals, has at least two interesting implications.

As long as hedonic quality attributes are directly related to be-goals, and thus closer to the user's Self, they may be the driver for 'emotional product attachment' (Belk, 1988). Of course, a product can exert a certain amount of functional attachment, if it is the only available product performing a particular do-goal. However, in the case of many products competing for the same do-goals, this type of attachment may not be very pronounced. Take a dishwasher as an example: it certainly performs an important and relevant function (which becomes painfully obvious the moment it breaks down); however, how important is a *particular* dishwasher to its user? We believe that any dishwasher is easily replaced by, for example, a cheaper one given the same expected functional quality. This is primarily because of a lack of emotional attachment to the product itself. With some hedonic quality, emotional attachment to the product or at least the brand may be much stronger.

On the other hand, people suffer from a phenomenon called 'lay functionalism' (Hsee et al., 2003). Lay functionalism is a bias in human choice, which systematically over-emphasises the core function of a product (the do-goal level) and discounts more peripheral attributes (the be-goal level). This effect is mainly driven by justification processes. In general, it seems easier to justify the expenses for something practical compared to something hedonic. This is problematic, since because of this bias, we may end up with a product that felt appropriate at the moment of decision but lacks important experiential, hedonic qualities. Beauty in products, for example, may be viewed as an unnecessary luxury. But imagine using an ugly product every day.

Measuring hedonic quality perceptions

Empirical measurement is at the heart of the self-concept of any practitioner or academic in the field of HCI. It is one of the 'golden rules' of HCI (Gould & Lewis, 1985) and an important part of standard practices (ISO, 1999). Accordingly, any proposed model of UX in general and specific new concepts such as hedonic quality should be quantifiable. Note, however, that there is no such thing as good measurement if an underlying model is non-existent or implausible.

For the concept of hedonic quality, measurement is in principle an easy task (compared to the measurement of more temporally oriented concepts of UX, see below). One must identify a list of underlying psychological needs and link them to product attributes. For instance, Hassenzahl (2004) suggested a collection of 28 semantic differential items measuring



pragmatic quality perceptions (e.g. 'simple – complicated'), hedonic quality stimulation (e.g. 'original – typical'), hedonic quality identification (e.g. 'isolating – integrating') and appeal (e.g. 'good – bad'). The underlying needs for the hedonic quality are a need for novelty and change (growth-oriented) and a need for self-presentation and belonging (socially oriented). The actual list of attributes and underlying needs can be debated and may depend on the product and the context of use. However, any serious measurement instrument must rely on a model that establishes a clear link between product perception and underlying needs.

But good measurement has at least two additional requirements:

- **Select the right level of granularity.** Any list of needs is a good start; however, make sure that people are able to differentiate between related product attributes. Take usability and utility as an example. From an HCI perspective, both can be separated: utility is about whether a product provides important functionality (the what) and usability is about how this functionality is accessed (the how). Nevertheless, for a layperson this distinction may already be irrelevant. If utility equals personal value, one may question the value of any product whose functionality is, in principle, available but, in fact, inaccessible. In the end, the function cannot be performed and from a user's perspective, the reason does not really matter. An expert, however, would find different remedies for a utility versus a usability problem and, thus, for her the distinction makes sense. In other words, a level of granularity in attributes, which makes sense for an expert in interactive products, may not be understood by users. However, any attempt at measurement must take the users' ability to differentiate between product attributes into account and must prove that users are able to distinguish between the different constructs measured.
- **Separate importance from perception.** Importance of hedonic and pragmatic aspects should be a different objective for measurement. Hassenzahl (2003) explicitly separated pragmatic/hedonic quality perceptions from appeal, i.e. the general, overall evaluation of the product. It is assumed that people are able to recognise pragmatic and hedonic attributes because they represent important underlying human needs, but that this does not necessarily imply that those attributes are valued, too. A product may be perceived as 'original', but that does not mean that you 'like' it to be so. In measurement, the importance of aspects can be estimated implicitly by relating attributes to appeal (with, for example, a regression analysis). The higher the relation the more important is the attribute for 'explaining' and predicting appeal. One could also obtain the importance of each attribute

by, for example, a simple ranking exercise or more elaborate weight elicitation methods known from research on multi-attribute decisions. The separation of importance from perception has an important implication: it allows for variations in importance from situation to situation. Hassenzahl et al. (2002), for example, showed perceptions of pragmatic quality to be predictive for appeal only in task-oriented situations (as one would expect).

Temporal dimension of UX

In addition to the rather static model of UX attributes and user needs described earlier in this paper, UX also has a temporal dimension, which is interesting and especially challenging from a measurement perspective. Forlizzi & Battarbee (2004), for example, understand 'an experience' as something with a definitive beginning and end. Whatever happens during this 'usage episode' is the user (usage) experience.

Kahneman (1999) distinguished 'instant' and 'remembered' utility. Instant utility is the goodness or badness of a particular moment during an episode, whereas remembered utility is the retrospective, summary assessment of the whole episode. Experience probes taken during the usage episode, such as the question of how one feels at the moment, are an experiential measurement, as opposed to the retrospective question of 'How did you feel during product use?'. Interestingly, Kahneman and colleagues showed that remembered utility is not necessarily the sum of all instant utilities (see Hassenzahl & Sandweg, 2004). (An example for HCI related work, which uses experiential and retrospective measures, is Hassenzahl & Ullrich, in press.)

Both experiential measurement and retrospective episode evaluation are interesting approaches to the measurement of UX, as they serve different purposes. Experiential measurement is able to show how users' (affective) states change over time, while retrospective evaluation reveals what users make of their experience. For example, experienced negative affect because of an encountered critical incident in the midst of product use must not necessarily lead to a negative retrospective product evaluation. Maybe the user did not attribute the negative moment to the product, but to his lack of expertise. Or he simply can't remember the negative moment due to the large number of other, much more positive moments.

The temporal perspective on UX is especially challenging for practical evaluation, because it stresses the importance of spending time with a product to build an appropriate experiential basis for judgments. Any individual is able to judge and even choose among products even if actual experience is limited to only a small number of moments. Nevertheless, the initial judgment may not be confirmed by subsequent experience. Disappointment is a likely consequence. In practice, HCI-oriented product development teams may only rarely extend systematic evaluation to real usage (i.e., beyond product release) because at this point in time the product is on the market and is very difficult to fix. (Web applications, i.e. services,



may be a notable exception.) However, from a UX perspective it seems crucial to monitor product experience throughout the whole product lifecycle and to use these findings at least as a guide for future products.

Implications of hedonic quality for design

The fact that hedonic quality can be measured does not make it a trivial concept from a design perspective. First, designers must strive for a balance between both pragmatic and hedonic aspects. Do-goals must be supported properly by a product; however, without hedonics a user may never become really attached to a product. Second, one must think about ways to design for hedonics. So far, the most prominent strategy is to put something useful in a beautifully designed box. However, hedonics can be more conceptual: for example, designing search functionality that allows for discovery rather than keyword-directed search. Third, when designing, it may be helpful not only to focus on the immediate do-goal to be supported (e.g. 'to make a telephone call'), but also to keep the underlying be-goal in mind (e.g. 'to make a telephone call to feel related to another person'). An example for this approach is the work on technology-mediated intimacy (e.g. Kaye et al., 2005), 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.

Conclusion

UX has many facets. The present paper summarised our notion of UX as addressing needs beyond the instrumental and ways to measure according concepts. Note, however, that it is not the measurement *per se*, but the underlying model, that is crucial. Models can vary and each may use its own constructs, terms, and approach. Nevertheless, there are some general requirements for an appropriate model of UX (which hold for any other model): it must be plausible, as parsimonious as the complexity of UX allows for, supported by empirical data and generative in the sense that it produces useful insights.

Hedonics as an approach to UX highlights its difference to traditional usability. Its grounding in human needs reminds us of what is important in life. In the end, it is all about value (Cockton, 2004). And only a most puritan perspective may view productivity as a value in itself. Productivity is a means, a do-goal, sometimes important, sometimes not, but always employed with a more basic be-goal in mind. UX seeks to broaden usability by asking not only how people do things, but also why they do them.

To adapt the words of economist Steven Landsburg (1993, p. 44): "Usability wants us to die rich; UX wants us to die happy".

References

- Belk, R. W., 1988. Possessions and the extended self. *Journal of Consumer Research*, 15, 139–168.
- Carver, C. S. & Scheier, M. F., 1989. *On the self-regulation of behavior*. New York: Cambridge University Press.
- Cockton, G., 2004. From quality in use to value in the world. In *Proceedings of the CHI 04 Conference on Human Factors in Computing Systems. Extended abstracts*, 1287–1290. New York: ACM.
- Forlizzi, J. & Battarbee, K., 2004. Understanding experience in interactive systems. In *Proceedings of the 2004 conference on Designing Interactive Systems*

- (DIS 04): processes, practices, methods, and techniques. New York: ACM.
- Gould, J. D. & Lewis, C. H., 1985. Designing for usability: key principles and what designers think. *Communications of the ACM*, 28, 300–311.
- 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.
- Hassenzahl, M., 2004. The interplay of beauty, goodness and usability in interactive products. *Human Computer Interaction*, 19, 319–349.
- Hassenzahl, M., Kekez, R., & Burmester, M., 2002. The importance of a software's pragmatic quality depends on usage modes. In H. Luczak, A. E. Cakir, & G. Cakir (Eds), *Proceedings of the 6th international conference on Work With Display Units (WWDU 2002)*, 275–276. Berlin: ERGONOMIC Institut für Arbeits- und Sozialforschung.
- Hassenzahl, M., Platz, A., Burmester, M., & Lehner, K., 2000. Hedonic and Ergonomic Quality Aspects Determine a Software's Appeal. In T. Turner & G. Szwillus (Eds), *Proceedings of the CHI 2000 Conference on Human Factors in Computing*, 201–208. New York: ACM, Addison-Wesley.
- 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.
- Hassenzahl, M. & Tractinsky, N., 2006. User Experience – a research agenda [Editorial]. *Behavior & Information Technology*, 25, 91–97.
- Hassenzahl, M. & Ullrich, D. (in press). To do or not to do: Differences in user experience and retrospective judgments depending on the presence or absence of instrumental goals. *Interacting with Computers*.
- Hsee, C. K., Zhang, J., Yu, F., & Xi, Y., 2003. Lay rationalism and inconsistency between predicted experience and decision. *Journal of Behavioral Decision Making*, 16, 257–272.
- ISO, 1999. *ISO 13407: Human-centred design processes for interactive systems*. International Organization for Standardization.
- Kahneman, D., 1999. Objective happiness. In D. Kahneman, E. Diener, & N. Schwarz (Eds), *Well-being: The foundations of hedonic quality*, 3–25. New York: Sage.
- Kaye, J., Levitt, M. K., Nevins, J., Golden, J., & Schmidt, V., 2005. Communicating intimacy one bit at a time. In *Proceedings of the CHI 05 Conference on Human Factors in Computing Systems. Extended abstracts*, 1529–1532. New York: ACM.
- Landsburg, S. E., 1993. *The armchair economist*. New York: Free Press.
- Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T., 2001. What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology*, 80, 325–339.

CfP

Tangible and Embedded Interaction 2008

18–21 February 2008 • Bonn, Germany

TEI'08 is the second international conference dedicated to research in tangible and embedded interaction.

The conference brings together this new field, providing a meeting ground for the diverse communities of research and practice involved with tangibles – from computing, hardware, and sensor technology, to HCI, interaction design, and CSCW, to product and industrial design and interactive arts. Submissions are invited from all of these perspectives, be they theoretical, conceptual, technical, applied, or artistic.

Work addressing HCI issues, design, use context, tools and technologies, as well as interactive art works are all welcome, including especially interdisciplinary submissions across these themes.

Submission deadline: **5 October 2007**

<http://tei-conf.org>