

User Experience Evaluation Based on Values and Emotions

Piia Nurkka

The Unit of Human-Centered Technology
Department of Software Systems
Tampere University of Technology
Korkeakoulunkatu 6
33101 Tampere, Finland
+358 40 849 0728
piia.nurkka@tut.fi

ABSTRACT

In this paper, we explore a user experience evaluation possibility by combining the identification of person's personal values and evaluation of product emotions. By personal values we mean a type of user concern that is guiding his/her choices and evaluations of products or actions in order to reach the desired goal. By product emotions we mean emotions that a certain product evokes in the user. Theoretical reasoning for this user experience evaluation approach is given by reviewing the existing literature. In addition, possible applications of use are suggested.

Keywords

User experience, emotions, values

INTRODUCTION

During the past years, the HCI research has shown a change of focus from usability to user experience (UX). As a consequence of this change, a need for development of new evaluation methods for capturing what is really important for the users has emerged. The goal should not only be to understand the aspects that make the interaction easy, but also to know what makes it enriching. It has become obvious that the design for user experience needs to aim to satisfy human needs beyond the merely instrumental, and to focus on how to create positive experiences rather than just prevent usability problems [12]. In other words, the aim of design is not only to serve our practical needs and to help us reach the practical goals, but also to give meaning to our life and to contribute to the quality of our life [12, 13].

In addition, besides taking into account the human needs beyond the merely instrumental, the affective and emotional aspects of the interaction, and the nature of experience must be understood to fully capture the essence of user experience [12]. Consequently, in evaluating user experience, all of these aspects should be taken into consideration. Affective and emotional aspects of UX are especially important in relation to products that are mostly targeted to leisure time use. Methods of UX evaluation are important in guiding designers in designing for a desired experience.

In this paper, we review the relevant literature from HCI, design and marketing relating to user experience research, and propose a user experience evaluation approach that is based on the understanding of user's non-instrumental goals (concerns) and emotional reactions in interaction.

PRODUCT QUALITIES AND UX

To date, there is a fair body of knowledge in HCI that looks beyond the task completion to the *experience* of the user in order to form an overall evaluative judgment on the quality of interactive products. A distinction on qualities comprising UX are made between the instrumental qualities (referring to the functional or pragmatic aspects of products), and the non-instrumental qualities (hedonic aspects of the product) [11, 14].

Mahlke et al. [14] make a further categorization on the non-instrumental qualities, and propose a hierarchical model relating to these. The top level of the hierarchical model is divided to aesthetic, symbolic, and motivational qualities. The aesthetic qualities appeal to the senses, and the natural dimensions are thus visual, haptic and acoustic. The symbolic qualities relate to the features that can be communicative (expressing some sort of symbolic value for the user, e.g. group membership) or associative to the user or others (e.g. bringing memories). The last category, motivational qualities, integrates motivational aspects of product use (e.g. what makes the user use the product; how stimulating the product is to use?). According to the study by Mahlke et al. [14], evaluation of interactive systems should incorporate a diversity of above-mentioned non-instrumental quality aspects to better understand user's overall judgments.

WHAT IS IMPORTANT FOR PEOPLE?

Hassenzahl and Roto [11] discuss the instrumental and the non-instrumental qualities in relation to user's *do-goals* and *be-goals*. Do-goals state the tasks the user needs to do (e.g. make a telephone call). Thus, they are directly related to the product utility. By contrast, be-goals illustrate the hedonistic needs of the user, the strive for the fulfillment of underlying psychological needs, and the ways (s)he wants to be. Be-goals should be met by the non-instrumental product qualities. According to Hassenzahl [9], the fulfillment of the be-goals is the

driver of experience. Lack of usability (i.e. do-goals are difficult to achieve) might impose a barrier to the fulfillment of active be-goals, but it is in itself not desired. Hassenzahl [9] emphasizes that what is desired is “to fulfill be-goals such as being autonomous, competent, related to others, stimulated, and popular through technology use (motivations to technology use that are either self-oriented or others-oriented)”.

To guide design, Karat et al. [13] suggest that a closer examination of what people value in life can lead to a better sense of how to address their needs regarding the increasingly varied use of technology. Furthermore, Cockton [p.52, 5] advises in designing to “focus on what people find worthwhile, what motivates them, what demotivates them, and how a balance of worth emerges from complex networks of costs and benefits”. The desired ends of interaction in Cockton’s terminology is called “worth”; the enduring value (in the world) that develops in meaningful connections between people and technology.

All of the above-mentioned authors emphasize the importance of understanding what is motivating and really important for people in relation to technology usage as those drive experiences.

Values

What, then, is important for people? In order to design, we need to understand what we are designing for. Hassenzahl and Roto [11] mention psychological needs, and a person’s strive to be a person (s)he wants to be. From the social sciences point of view, one source of strivings is human *values*. According to Schwartz [20] values motivate people’s behavior to strive to attain a desirable goal; they serve as a standard or criterion to guide in the selection or evaluation of actions or things. They can express different interests (individual, communal, or both) and they can be weighed differently (important – not important) [20]. Therefore, values can be seen as guiding principles in people’s lives, influencing user behavior to help in reaching the things that really matter to the user.

Influence of values to behavior

In marketing the influence of values to consumer behavior has been recognized, and the understanding of consumer’s values is considered important in order to facilitate better match with prospect consumers and marketing efforts. For example, the Means-End approach (Means-End Chain Analysis) aims to find out and understand the linkages between the attributes that exist in products (the “means”), the consequences for the consumer provided by the attributes and the personal values (the preferred “end-states”) the consequences reinforce [18]. The idea behind the Means-End Chain is that consumer’s decision making is about evaluating and selecting alternative behaviors and actions to reach the desired end-state, and not about choosing a product *per se*. Consumers evaluate choice alternatives in terms of both the positive and negative consequences that are most personally relevant to them. Thus, the consumer is likely to choose that alternative which is anticipated to bring most consequences or experiences and fulfill most of the be-goals.

Judgment and selection of products

Allen [2] has studied influence of human values on product preference. According to Allen, values influence the product preference through two different routes; directly or indirectly (dual-process model). In the former route, the consumer attends to the product’s symbolic meaning and evaluates the product as a whole relating to his/her self (image). The judgment is affective, holistic and intuitive, and arouses high emotional states. By contrast, the indirect route for value influence is via product’s tangible attribute importance. The consumer judges the product attribute by attribute in a piecemeal fashion and the primary function of the product is instrumental (need to control and manipulate the environment).

Furthermore, in Mittal’s [16] study it was found out that if the products are expressive (i.e., they are sought for psycho-social goals like sensory-pleasure, and self-concept fulfillment, rather than for utilitarian goals), then the predominant mode of consumer brand and product selection is the affective choice mode.

The results of these studies indicate that when the consumer’s primary aim is to fulfill be-goals (aka values or motives), the consumer judges the product based on the emotions evoked by the product.

EMOTIONS

As the above-mentioned examples show, much of our being is driven by emotion. They are a necessary part of life affecting how we feel, behave and think [17]. Emotions are always passing judgments, presenting us with immediate information about the world: pointing out potential dangers, or showing what is nice or bad [17]. A central notion of emotion is state of action readiness; emotions give impulses to approach or avoid and desires to act in certain way [8]. In this sense, it’s logical that design approaches aiming at understanding the role of emotions in interacting with products have received attention in the past few years.

For example, Agarwal and Meyer [1] developed a methodology that combined verbal and nonverbal emotion scales, and thereafter conducted a usability study in which two different Customer Relationship Management application interfaces were compared based on traditional usability metrics (time on task, number of errors) and emotional response data. The results show that emotions may be central on how a user judges the overall product experience, and may also affect how a user perceives usability. Usability evaluation alone doesn’t give a truthful measure of the quality of the product.

In the research by Mahlke and Thüning [15], relation between perception of instrumental quality (usability), non-instrumental quality (aesthetics) and emotional reactions, and their effect on overall UX was studied. The results indicate that both quality aspects, usability and aesthetics, influence emotional reactions, and affect on the overall judgment of UX.

The reviewed literature shows that emotions have an effect on UX both as a cause and a consequence, and thus, measuring emotions should be included in UX

evaluation. However, finding out what kinds of emotional reactions the user has while interacting with a product seems not sufficient to understand the many aspects of UX. The reasons for the emotional reactions should also be included in evaluation to understand the motivational aspect of product use, the be-goals as part of UX.

UX EVALUATION BASED ON VALUES AND EMOTIONS

To understand and being able to evaluate overall UX as many aspect of UX as possible should be considered; the non-instrumental needs (be-goals), emotional reactions in interaction and the nature of UX. However, the most important issues from a design point of view seem to be the understanding of the be-goals and the emotional reactions in the interaction, and the relationship between them.

The idea behind the UX evaluation approach based on values and emotions is to concentrate on the person experiencing. After all, an important success factor of good UX is how well the user manages to fulfill his/her be-goals. In addition, perspectives on how interactive products can bring value to people's lives are considered and explored [3, 5, 22]. For instance, designed objects and experiences provide a tangible means for people to engage with the world on an existential level [4] and products may help the person to become what (s)he wants to be [22].

This approach presented here relies yet solely on theory, and the evaluation method is still under development, and. A pilot study to test the idea is being planned.

Relation between emotions and values

Like the previous sections disclose, emotions and values are closely related to each other. According to Frijda [8] every emotion hides a concern. In Frijda's vocabulary, concern is a synonym for a motive, a need, a desire, a striving, a major goal and a value, referring to the things that people care for and are important for them. A concern is what gives a particular event its emotional meaning and vice versa, emotions point to the presence of some concern.

The Model of Product Emotions by Desmet [7] presents the relation of concerns and emotions in interaction with a product. The model presents a theoretical basis of the process that underlies all emotional responses to consumer products. The main proposition of the model is that all emotional reactions result from an appraisal process in which the individual appraises the product as (potentially) harming or favoring one or several of his or her concerns. Thus, the concerns and the appraisal determine if a product evokes an emotion, and if so, what emotion is evoked. To evaluate UX based on emotions and values, we can use the model as a framework.

Identifying values

The first step of the evaluation process is to identify what is important for user by surveying users' concerns. There is no specific method to identify concerns, but as values are a type of concern, a survey on values can be used. There are several surveys available to identify values and to categorize respondents into predetermined groups of

social entities according to their dominant values (e.g. Schwartz Value Survey [19], or VALS [21]).

In UX evaluation, users' motivation to use the product is important to understand, and therefore Portrait Values Questionnaire (PVQ) [20] might be an appropriate tool. It is based on Schwartz's [19] theory of human values. The PVQ measures values indirectly, and the respondents are unaware that they are answering for a values questionnaire. The PVQ asks the respondent to evaluate whether he/she is similar to the person portrayed in the questionnaire in terms of their goals, aspirations and wishes. Thus, the questionnaire is quite concrete and contextualized, and provides information on which motivational types of values and their goals are important for the respondent.

Measurement of emotions

The second step in the evaluation process is measuring user's emotional reaction in interaction with the product. There are several different emotion tools available. The criterion in selection of the tool is that it should be intuitive and usable right after the interaction event (or exposure to the stimulus). Product Emotions measurement instrument (PrEmo) [6] fulfill the requirements. The instrument is based on animations of emotions presented by a cartoon character, which gives more cues about the portrayed emotion. Thus, selecting the "right" emotion is easier than with only pictures or wordings.

Evaluating UX

As the Model of Product Emotions state, emotions arise when some event (e.g. interaction with a product) is appraised as relevant to the person's concerns. The proposition of this paper is that identifying values and measuring product emotions concurrently might set light on two interrelated questions. First, why the product is considered important, and second, why the different emotions are evoked. Analysis of value importance in relation to emotions should answer both questions. For example, if a person values achievement, (s)he is likely to have positive emotions towards a stimulus that represents success, and negative emotions on more modest stimulus.

Application areas

This approach is estimated to be fitted in evaluating UX of early concept designs. Concepts are descriptions of products that give a general idea of the product and it's usage. Thus, concepts enable the user to associate and imagine quite freely and leave space for genuine emotional reactions. In addition, the evaluation would reveal if the concept is targeted to a right target group

CONCLUSIONS

In this paper, we have presented literature reasoning a novel user experience evaluation approach based on values and emotions. The novel evaluation approach aims at understanding and evaluating UX by combining the identification of user's be-goals (values and motives), and measurement of emotions. The approach relies on theory, and the evaluation method is still in development. The next step in the development is to pilot the approach.

ACKNOWLEDGMENTS

I thank reviewers who provided helpful comments on the first versions of this paper.

REFERENCES

1. Agarwal, A., and Meyer, A. Beyond usability: evaluating emotional response as an integral part of the user experience. In: *Proceedings of ACM CHI 2009* (Boston USA, May 2009), ACM Press, 2919-2930.
2. Allen, M.W. A dual-process model of the influence of human values on consumer choice. *A revista Psicologia: Organizações e Trabalho (rPOT)*, 6, 1 (2008), 15-49.
3. Boehner,
4. Chapman, J. Emotionally Durable Design: Objects, Experiences and Empathy. Earthscan Ltd, UK, 2005.
5. Cockton, G. Designing worth - connecting preferred means to desired ends. *interactions* 15, 4 (Jul. 2008), 54-57.
6. Desmet, P.M.A. Designing Emotions (PhD dissertation) Delft: Delft University of Technology, 2002.
7. Desmet, P.M.A. A multilayered model of product emotions. *The Design Journal*, 6, 2 (2003), 4-13.
8. Frijda, N.H. The laws of emotion. Lawrence Erlbaum Associates, Mahwah, NJ, USA, 2007.
9. Hassenzahl, M. (in press). User Experience (UX): Towards an experiential perspective on product quality. In: *Proceedings of the 20th French-speaking conference on Human-computer interaction (Conférence Francophone sur l'Interaction Homme-Machine) IHM '08* (Metz, France, September 2008).
10. Hassenzahl, M. Hedonic, emotional, and experiential perspectives on product quality". In C. Ghaoui (Ed.), *Encyclopedia of human computer interaction*. London: Idea Group, 266-272, 2006.
11. Hassenzahl, M. and Roto, V. Being and doing: A perspective on User Experience and its measurement. *Interfaces*, 72, 10-12, (2007).
12. Hassenzahl, M. and Tractinsky, N.. User Experience – a Research Agenda". *Behaviour and Information Technology* 25, 2, 91-97, (2006).
13. Karat, J., Karat, C-M. & Vergo, J. Experiences People Value: The New Frontier of Task Analysis
In: (Eds) Stanton, N., A. Diaper, D. & *The Handbook of Task Analysis for Human-Computer Interaction*; Lawrence Erlbaum Associates, 585-603, 2004
14. Mahlke, S., Lemke, I. & Thüring, M. The diversity of non-instrumental qualities in human-technology interaction. *mmi interaktiv*, 13, 55-64, (2007).
15. Mahlke, S., and Thüring, M. Studying Antecedents of emotional experiences in interactive contexts. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (San Jose, California, USA, April- May 2007). CHI '07. ACM, New York, NY, 915-918.
16. Mittal, B. The role of affective choice mode in the consumer purchase of expressive products. *Journal of Economic Psychology* 9, (1988), 499-524.
17. Norman, D. Emotional Design. Basic Books, NY, USA, 2004.
18. Reynolds, T.J and Olson, J.C (eds.) Understanding Consumer Decision Making: The Means-End Approach to Marketing and Advertising Strategy. Lawrence Erlbaum Associates Mahwah, New Jersey, USA, 2001.
19. Schwartz, S.H. Universals in the content and structure of values: theoretical advances and empirical test in 20 countries. In Zanna, M. (Ed.), *Advances in Experimental Social Psychology*, Vol. 25, Academic Press, New York, 1-65, 1992.
20. Schwartz, S.H., Melech, G., Lehmann, A. Burgess, S., Harris, M. & Owens, V. Extending the Cross-Cultural Validity of the Theory of Basic Human Values with a Different Method of Measurement. *Journal of Cross-Cultural Psychology* 32, 5, 519-542 (2001).
21. VALS. SRI Consulting Business Intelligence, Menlo Park, CA, USA, 2006.
22. Zimmerman, J. Designing for the self: making products that help people become the person they desire to be. In: *Proc. CHI 2009* (Boston, USA, May), ACM Press, 395-404.