
Hands-on Values: A Value-based Evaluation

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Abstract

In order to evaluate prototypes, which aim at fostering elderly's social interactions, we tried to find an approach that not only accounts for values, but also for usability, acceptance and experience factors addressing the interaction between users via the technology.

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Despite a variety of value-based approaches in HCI for the development of technologies, we faced a lack of practical frameworks, which consider those usability, user acceptance and user experience factors. We finally encountered the theory of consumption values, which predefines five values, i.e. the conditional, the functional, the emotional, the epistemic and the social value. After adding a further interpersonal value the approach is able to encompass those factors for evaluation purposes.

Keywords

User-Centered Design, Value-Centered Design, Value Sensitive Design, Usability, User Experience, User Acceptance

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

The third-wave HCI, focusing on values, emotions, experience, etc. holds a great potential for design and research in HCI. Apart from the first-wave HCI, which targeted mainly formal methods, and the second-wave, which is characterized by a user-centered design

approach in the workplace, the third-wave integrates also leisure, arts, and home [2].

The focus on values, which is emphasized in the current third-wave, is very interesting for our work on elderly's social interaction in two Ambient Assisted Living (AAL) projects. In one of the projects a tele-presence system is developed, which aims at socially connecting elderly with their families, caregivers and peers. The second project refers to intergenerational online activities for geographically distant grandparents and grandchildren. It provides a platform with different activities, e.g., playing a game or reading a book together over distance. The goal of the project is to improve the platform and enrich it with further activities.

In HCI two approaches explicitly address values in the development of technologies: value-centered design (VCD) or worth-centred design (WCD) (e.g., [6]) and value sensitive design (VSD, e.g., [8]). VSD accounts for human values [8], referring to an ethical and moral responsibility of designers [7]. VCD also takes the value as starting point for the design of technologies, but without primarily focusing on moral import [6].

Our Approach

For evaluating the prototypes, which were developed by our technical project partners, we were interested in evaluating those aspects of the technology, which account for our users' values. These can be related to the usability of the technology, but also to how the users experience the social interactions via the technology. Furthermore, the acceptance of the technology needs to be assessed. Despite the variety of value-centered approaches, we did not find a practical framework for the evaluation of the prototypes, which

not only considers values, but also usability (U), user acceptance (UA) and user experience (UX) factors.

During a literature review on values, U, UX and UA, we encountered the theory of consumption values (TCV) [11], which was used by Hedman and Gimpel [10] to explain the adoption of a hyped technology, i.e. the iPhone. The most salient finding was that it encompassed aspects of usability, user experience and user acceptance aspects per se: The functional value, which is defined as the perceived utility for achieving a specific task or a practical goal, refers directly to the UA factor perceived ease of usefulness (e.g., [5]), and indirectly to many usability factors, e.g., efficiency and effectiveness (e.g., [3]). The epistemic value, which is related to experiencing new products, captures the UX (and also UA) factors curiosity and learning (e.g., [13]). The conditional value, referring to products being tied to specific contexts, is similar to the situational context, like Grill and Tscheligi [9] understand it. The social value, as the symbolic importance of the artifact for conveying social image, can be linked to the UX factors social image (e.g., [4]) or self-expression (e.g., [13]). Finally, the emotional value is the potential of the product to arouse emotions, which are believed to accompany the use of a product. Taking UX factors like fun/perceived enjoyment (e.g., [14]) or computer anxiety (e.g., [14]) into account, the factor captures all of these content-wise.

In this way we assigned many U, UX and UA factors, which we identified in literature, to the values as long as they were relevant in our project context. However, in the end some factors were left, as they did not fit a value so far, like the UX factors social presence (e.g., [1]) and social connectedness (e.g., [12]).

Therefore, we added the 'interpersonal' value, which refers to the experiences while an interaction between humans via a technology, but not for the purpose of self-presentation. The difference to the social value, which might at the first glance have also been appropriate for the above-mentioned factors, is its goal, as the social value refers to the social image, i.e. representing oneself in a certain group of people. The following table illustrates the six values and the related U, UX and UA factors:

Value	Definition	Related factors
Functional Value	The perceived utility for achieving a specific task or a practical goal [10]	Perceived ease of use Perceived usefulness Perceived adaptivity Perceived sociability Effectiveness Efficiency Memorability Reliability Learnability Accessibility Satisfaction
Social Value	The symbolic importance of the technology for conveying social image [10]	Self-expression Social Image
Emotional Value	The potential of the product to arouse emotions, which are believed to accompany the use of a technology [10]	Fun/perceived enjoyment Engagement Computer Anxiety
Epistemic Value	Experiencing new technologies [10]	Computer playfulness Learning Curiosity
Conditional Value	Technologies being tied to a specific context [10]	Situational context

Interpersonal Value	Experiencing others via the technology	Social Connectedness Social Presence Reciprocity Co-experience
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Table 1: Values and related factors

Although the functional value consists of many different factors, all values are equally important in the beginning. The emphasis in the evaluation is thus not defined by the amount of related factors, but by the results of the requirements analysis.

In the project about intergenerational online activities we conducted interviews and workshops with end users and experts as well as a survey in order to identify the end users requirements. Thereby, we figured out that for our target group, the grandparents, the functional value, the emotional value, and the interpersonal value are of special importance. The functional value takes into account that elderly sometimes lack profound computer skills. The emotional value considers a potential computer anxiety, but also the fun, the users might experience during the online activities. The interpersonal value is highly relevant, as the aim of the platform is to connect geographically distant grandparents with their grandchildren. The requirements analysis revealed that this might help overcome the barriers for using computers at all.

Outlook

We considered the above-mentioned values as being a starting point for an approach to evaluate different technologies. In order to operationalize the values, we relied on usability, user experience and user acceptance factors and respectively available measurements (e.g., scales).

The aim of the presented approach was initially the evaluation of technologies. However, it could also be used in the design phase by representing the identified users' requirements categorized in terms of the above-mentioned values. Thus, the design is informed by first-hand user data, and the technology can also be evaluated on basis of the values. However, further applications of our approach will be needed to prove whether the approach is suitable in this more holistic setting.

Our approach not only presents a pool of potential user values, but also contains the possibility to weight them according to the actual users' requirements. It might be seen as a practical supplement for value-centered design, regarding value sensitive design, it needs to be discussed, if or how moral values should be integrated.

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