ViA - Values in Action within Healthcare

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Abstract
The shift in HCI towards emotions, values, needs etc., (third-wave HCI) reflects a new understanding of interactions between users and technology. We identified a lack of suitable theory, frameworks and concepts, which provide an integrated view on values as well as on usability, user experience and user acceptance [6]. Therefore, we applied the Values in Action (ViA) approach, which aims to support healthcare related Ambient Assisted Living (AAL) projects, in order to develop valuable ICT solutions for older adults, their relatives and formal care giver. It helps to understand what is valued by different users.

Author Keywords
User-Centered Design, Value-Centered Design.

Introduction
As older adults are increasingly ageing in place as a preferable alternative to institutional care, a lot of new ICT solutions are developed for them within healthcare. The acceptance of these technologies and services depends on obvious advantages and benefits, like functionality, utility, usability, price/financial resources, (data) security and adequate (i.e. barrier free and not stigmatizing) design but also on the technological experiences of older adults.

We are interested in those aspects of the technology, which account for the users' values, in order to develop valuable prototypes within two healthcare related

Ambient Assisted Living (AAL) projects (CVN[1] and GeTVivid[2]). These aspects can be related to how usable the technology is, but also to how the users experience the interactions with and via the technology, as well as the acceptance of the technology. Therefore, we applied an approach that combines value- and user-centered design with factors related to usability (U), user experience (UX) and user acceptance (UA).

The ViA Approach

During a literature review on values, U, UX and UA, we came across value-centered design [5] and value sensitive design [7]. However, both were not sufficiently suitable for our purposes, as they are rather abstract and the integration of U, UX and UA factors was not practicable for us. Additionally, we encountered the theory of consumption values (TCV) [11], which was used by Hedman and Gimpel [9] to explain the adoption of a hyped technology, i.e. the iPhone. The most salient finding was that it encompassed aspects of U, UX and UA aspects per se. The TCV focuses not only on functional values, but also on hedonic qualities (e.g., emotional or epistemic values).

We called our approach *Values in Action (ViA)* as it is based on the consideration that values can include the user's perspective (e.g., emotions, experiences) as well as technological aspects, which are important for our projects. Figure 1 illustrates the six values (that we already proposed earlier [6]) and the assigned potentially relevant U, UX and UA factors for AAL projects. In other AAL projects, we have used ViA for evaluating ICT solutions and wanted now to apply it in the whole development process.

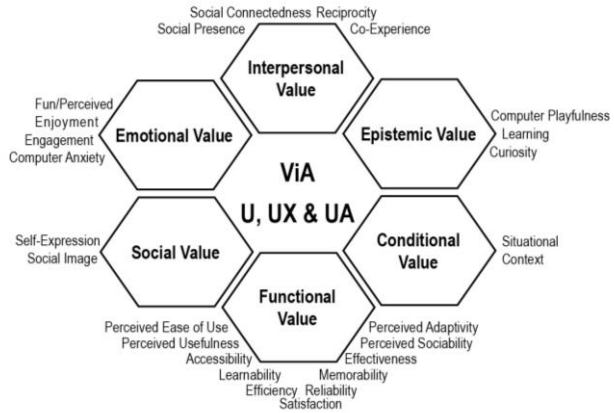

Figure 1: ViA U, UX and UA [6]

The functional value, which is defined as the perceived utility for achieving a specific task or a practical goal, refers directly to the UX factor perceived sociability (e.g., [10]), to the UA factor perceived ease of use and perceived usefulness (e.g., [4]), as well as indirectly to many usability factors like efficiency and effectiveness (e.g., [2]). The epistemic value, which is related to experiencing new products, captures the UX (and also UA) factors curiosity and learning (e.g., [12]). The conditional value referring to products being tied to specific contexts is similar to the situational context, like Grill and Tscheligi [8] 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., [3]) or self-expression (e.g., [12]). Finally, the emotional value is the potential of the product to arouse emotions, which are believed to

[1] http://www.connectedvitality.eu/

[2] http://www.getvivid.eu/

accompany the use of a product. Taking UX factors like fun/perceived enjoyment (e.g., [14]) or computer anxiety (e.g., [14]) into account.

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 remaining, as they did not fit to a value so far, like the UX factors social presence (e.g., [1]) and social connectedness (e.g., [13]). 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 referring to the social image, i.e. representing oneself in a certain group of people.

Application of the ViA Approach

In both projects we started with the user requirements analysis and identified needs in workshops, interview and a survey. On basis of the ViA, we identify relevant values at the end of the analysis phase, which are connected to aspects of the technology and are important for the end users in order to actually use the system. For identifying the values and factors we analyzed the results report again with the help of an affinity diagram. These values are an integral input for the concept, design, and development phase, and also serve as a basis for the evaluation phase. Although the functional value consists of many different factors, other values might be equally or even more important.

Our approach not only presents a pool of potential user values, but also offered the possibility to weight them according to the users' requirements, their needs and wants. The most important values and factors guided then the design/ development phase, e.g., helped to prioritize functionalities together with user needs or develop an ICT solution with an added value.

The aim of the evaluation phase is to figure out whether the ICT solution satisfies the users' needs, wants, and whether it delivers the intended values. For conceptualizing the evaluation phase our approach takes into account the manifoldness of the users' requirements regarding U, UX and UA. In our lab studies the functional value is of particular importance as typically only limited prototypes are tested. In our field studies the weighted values and related factors helped us to prioritize them, as not everything could be evaluated in detail (otherwise the user studies would have become too extensive for our older adults).

Discussion

We emphasize that ViA is an open approach and believe that for other projects and user groups different factors or values might be appropriate. Additionally, one ViA per project might not be enough and different ViAs (containing different factors with different weights) are needed for the different user groups (i.e., older adults, relatives and care givers). This can help to prioritize the development of functionalities addressing values being most important for the user groups. This ensures that the developed system is valued by user groups.

Conclusion

We extended the theory of consumption values [11] with U, UX and UA factors and combined it with user-centered design to provide a valuable framework for developing appropriate ICT solutions within healthcare

for older adults. With our approach we try to combine theory with applied user research in order to inform the design and development of ICT solutions form different perspectives. Even if the current collection of values and related U, UX and UX factors is not complete, we think that they may help to get a balanced view on the healthcare solution. In order to not only address potential deficits to be compensated by the technology, it offers a perspective also on potentials and benefits that may arise.

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