

I2HOME-INTUITIVE INTERACTION FOR EVERYONE WITH HOME APPLIANCES BASED ON INDUSTRY STANDARDS

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INTRODUCTION

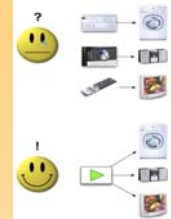
The scope of this project is the Intuitive Interaction for Everyone with Home Appliances based on Industry Standards. The elderly's needs and preferences differ significantly. However, only little is known so far on the antecedents, determinants, moderating factors, etc. of technology acceptance in the context of elder users. This implies that a system supporting the elderly comprehensively needs to be adaptive. The interfaces must be designed in a suitable way, and must be adjusted to elderly's cognitive abilities. In this way i2home will make devices and appliances at home more accessible to persons with mild cognitive disabilities, visual impairments and older persons, using a new mainstream user interface standard – the ISO/IEC FDIS 24752 Universal Remote Console (URC) standard. Most often, the design and the implementation of appliances, mobile phones and remote controls are driven by the ambition to satisfy users that are already engaged in modern technologies. Thus many people with disabilities, in particular persons with cognitive disabilities and older persons, are excluded from using modern technologies, at home and in the public. This also means that they are – and will be increasingly more – severely impeded in participating in our society, in living an independent life and in realizing their full potential.

OBJECTIVE

The main objectives of the project are the following:

- To make the digital home accessible to all.
- To create an open market for adaptable user interfaces for the digital home.
- To develop a technology to the task of empowering citizens to play a full role in society.

Figure 1: Change in the user's technological acceptance with i2home



MATERIAL AND METHODS

i2home will address this problem with an approach based on existing and evolving industry standards. It will focus on the use of home appliances (including consumer electronics) by our target users. At the same time, i2home will take care that the developed and standardized access strategies will be applicable to domains beyond the home. i2home will be built upon a new series of industry standards (ISO/IEC FDIS 24752) for interfacing networked appliances by means of a Universal Remote Console (URC). It will use a gateway-based architecture that incorporates a Universal Control Hub (UCH) as core component which provides and manages the communication to networked (off-the-shelf) home appliances and consumer electronics devices through industry networking protocols. The project will also follow a combination of "Design for All" and "Adaptive Design" approach in which all components are designed to be used by everybody, but adaptable to the particular needs of the users.

In User-Centered Design (UCD), the needs and limitations of the target users are the driving force for the development of the technology. In figure 3, the four phases of user-centred design are depicted. In its first phase, the future users of the system get interviewed and, based on their situation, skeletons, personas and corresponding scenarios are constructed. Phase two contains the actual implementation including evaluation of mockups and pre-version of the system or parts thereof. Also in this part, the participants are included. Next, tests with the real system are performed in the participant's daily environment, e.g., day-care center. Finally, the outcome of the tests are evaluated and—most importantly—fed into the UCD cycle again. In i2home, the UCD cycle is executed three times, each time with a more elaborate system including more interaction features and more targets.

Figure 2: Universal Control Hub (UCH) architecture

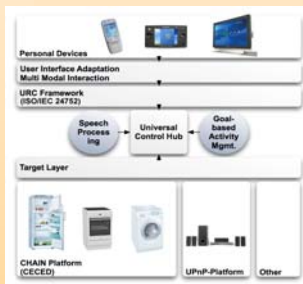
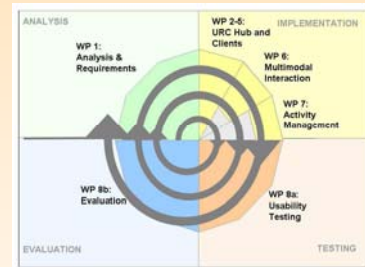


Figure 3: The four phases of user-centered design (UCD): Analysis, Implementation, Testing and Evaluation.



CONCLUSIONS

We invited care givers and care recipients interested in the project to contribute with interviews and testing. Specifically, the partners focus on the end users worked with four different kind of users (CTU worked with elderly, INGEMA with people with Alzheimer's Disease in mild to moderate stages; HI with people with Acquired Brain Injured; and SIS with people with vision impairments).

The goal of the interviews has been to be able to distill a set of requirements for the i2home system. The following factors have shown to be important for the design of the i2home system: (1) Reduced ability to memorize; (2) Decreased capability of problem solving; (3) Lack of attention; (4) Problems with reading, linguistic, and verbal comprehension; (5) Problems visual comprehension; (6) Impaired executive functions, such as, plan making, structuring, carry out activities.

For sensory-disabled persons, additional requirements on the system, such as, (1) The console has to include speech synthesis/screen reader software; (2) Its display has to be a high-contrast color display; (3) The console should include vibration to indicate events

Based on these interviews, we have constructed for each user group skeletons, personas and scenarios, including not just the participants but also additional factors, such as, relatives associated and/or living together with the participant. For each partner, several skeletons and personas have been constructed bearing the typical properties of the interviewed participants. A skeleton contain the general characteristics of a typical participant, whereas the persona is the concrete version.

This is an ongoing project that will be finish in 2009 and will develop a state-of-the-art system. The project includes several user groups of final users within whom the developed applications of i2home system will be tested: (a) people with disabilities; (b) older persons; (c) people with little or no technical affinity. This project will contribute to independent living and to realize the elderly's full potential.

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For more information:

www.i2home.org