Care@Home: An integrated approach to care and social inclusion of elderly

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Abstract

Ageing of society makes a paradigm shift in western care systems necessary. To be sustainable, new care systems have to be implemented to integrate medical and social aspects involving formal and informal caregivers. The use of technology becomes indispensible in this setting to facilitate self-management and cost-effective service delivery. Care@Home takes an innovative approach to the design of a service delivery platform that aims at supporting the elderly people's wellbeing and independence in their homes. With participatory and value sensitive design we ensure that the needs, concerns and values of the elderly but also of all other stakeholders are accounted for.

Introduction

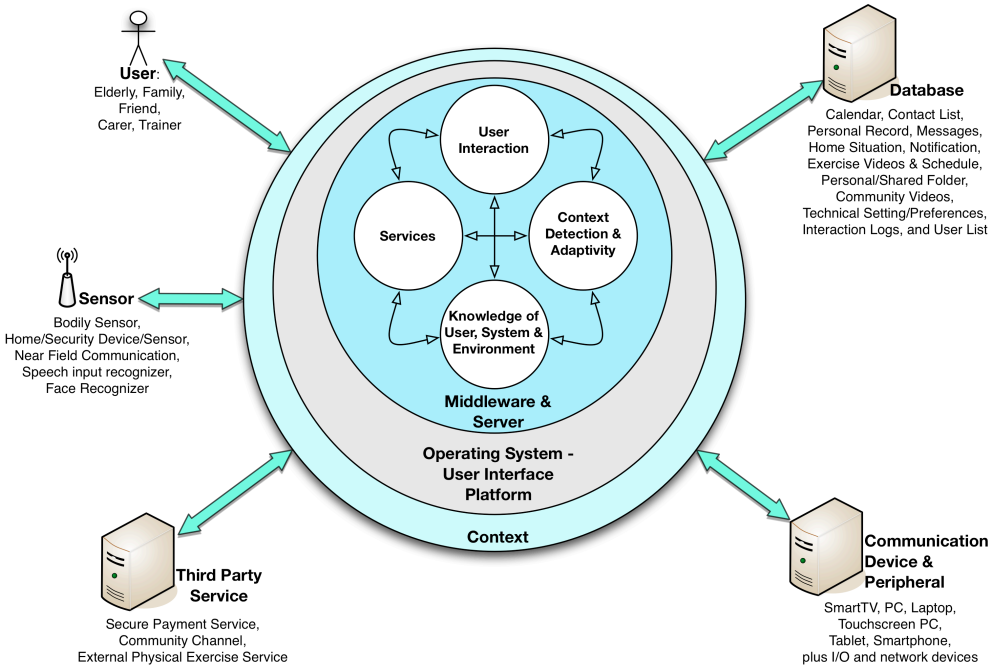
The world's population is ageing rapidly. This is a major societal challenge worldwide, but especially in Europe where already one in five persons is aged over 60 [1]. At the same time the working population is shrinking. The projections show a growing imbalance between the number of elderly citizens in need of care and the actual supply of formal care services. At the same time the prevalence of age and lifestyle related impairments and medical conditions are rising due to a combination of ageing and the effects of a sedentary lifestyle (Bloom et al., 2012; Eurostat, 2011). This trend not only results in a rise of healthcare costs, but also creates an enormous pressure on the resources in society (McPherson and Wister, 2008). It is clear that we can no longer expect that formal caregivers and professional institutions will provide the services for the support of our elderly. Therefore, implementation of services for elderly which integrate medical and social aspects is imperative as well as the use of technology to facilitate self-management and informal care as well as cost-effective service delivery. Key in this service design is to support the elderly in living independently in their own homes, but at the same time facilitating the provision of informal and formal care when needed and ensuring social inclusion.

Recent AAL projects have resulted in some promising ICT-based service solutions ensuring wellbeing and independence of older people in their homes. However, we found that the widespread introduction and acceptance of these systems could be improved. This is mainly due to (1) a lack of accessibility (high costs and efforts in installing systems) (2) psychological and technological barriers for elderly and (3) a lack of a holistic approach to system design which takes into account all stakeholders, services etc.

[1] United Nations Population Division (UNPD - 2011). World Population Prospects: The 2010 Revision. New York: UN Population Division.

To achieve better acceptance, an *inclusive* and *integrated* approach to AAL design for the elderly is needed that is cost-efficient and requires little adaptation in the home of the elderly. The term inclusive refers to a design which is suitable for a large amount of users with different degrees/types of impairment and at varying stages of technological literacy. An integrated platform is one which is designed to integrate personal services for the elderly (reminders, emergency detection, care, games), and the social network which includes formal/informal caregivers and community members.

The CARE@HOME project (www.careathome-project.eu) exemplifies this approach and aims at quality of life, improved accessibility and social inclusion. CARE@HOME is about enabling empowerment, wellness and social care in the home of elderly through interactive multimedia.



The Care@Home Platform

Fig 1: Overview

The elderly will interact with a smartTV which acts as a user-centred hub providing reciprocal communication for elderly, family, and caregivers and services for household, emergency detection, physical activity, community information and entertainment. Given the familiarity of interacting with a TV interface, the elderly are encouraged to use the provided services with an eventual goal of attaining a 'self-serve' society.

CARE@HOME is innovative in several respects. (1) It enables care services at home without the costs of retrofitting existing dwellings. (2) It provides an open platform (Fig 1) offering context-based services and adaptive user interaction that facilitates an independent lifestyle and the assurance of timely access to caregivers. (3) Technology (e.g. sensors and communication) is integrated in community-driven products, which are highly personalized and easy-to-use. The accessible platform opens up a market for continuous development of new services by various companies to be offered to the elderly without the need to install new hardware or software.

Methods

The design concept of CARE@HOME is focused on human-centred design for understanding the user in context. By employing Value Sensitive Design (Friedman et al., 2006) and Participatory Design (Kensing and Blomberg, 1998), we tackle usability, user experience, and ethical issues systematically through early user involvement and iterative integration of research and development.

"Value sensitive design is a theoretically grounded approach to the design of technology that accounts for human values in a principled and comprehensive manner throughout the design process." (Friedman et al., 2006) To that end, it provides an integrated and iterative three-part methodology consisting of conceptual, empirical, and technical investigations to incorporate knowledge of the ethical impact of a technology into the design. Furthermore, VSD introduces the notion of direct and indirect stakeholders, which expands user-centeredness to considering all people affected by a technology. This distinction helps to understand the perspectives of the elderly, formal and informal caregivers as well as all other people or institutions affected by the development of ICT-services for the elderly. For each group of stakeholders, harms and benefits are identified, and satisfying value trade-offs are aimed for.

In such a multi-stakeholder setting, it is not feasible to leave the decision making to the service designers or researchers alone. Involving participants, in particular future users, in the design of technology and its introduction to the daily practice of people has a long-standing tradition in the Scandinavian Participatory Design (PD) (Ehn, 1989). PD has a strong focus on empowerment of people who are confronted with the introduction of new technology in their workplace/life. Due to its historical scope PD has led to methods that engage in envisioning futures involving changes in the social, technological and political environment in which they are situated. Such a holistic approach to the design and introduction of technology is indispensible within the care domain. We expect that acceptance of the new technologies will increase through the engagement with stakeholders throughout the decision making (e.g. what type of services are useful) and design processes (i.e. the interface and interaction design).

Results

We are currently engaged in a number of research activities to collect knowledge regarding elderly-system-interaction mainly focusing on smartTV interaction. In this section, we describe some preliminary results and our ongoing activities.

In our recent design of a service for group awareness and communication between elderly and informal caregivers we conducted a qualitative, interview-based Wizard-of-Oz study with older adults. HTML mock-ups were used to gather feedback on early design concepts. In this research, we found that our participants viewed technology as complex to use and tended to resist adopting the technology, simply because the term smartTV is not familiar for them. However, after we referred it as a TV with a regular remote control, all participants were able to actually interact with the developed services at ease. This finding supports our choice of the communication platform. Another important finding was that elderly's preferences on the use of colours, font sizes, display layout, and privacy concerns differed (e.g. a number of participants

were not willing to share information, while an equal number preferred to share more information). This indicates that personalization is an important aspect in providing services that are tailored for each user's needs.

Applying our inclusive and participatory approach, we are currently conducting the following activities: (1) the study of cognitive and physical impairments of elderly and their effects on user-system interaction; (2) the design and testing of several user interfaces for smartTVs and tablet computers with elderly people; (3) an investigation of value-related concerns of the elderly; (4) an ethnographic study of the formal caregivers work.

Further research is planned to expand the focus of design activities to other stakeholders, e.g. informal caregivers such as family members, friends and neighbours. Ongoing user engagement in the form of interviews and focus groups to tackle value issues as well as prototyping and user evaluation is planned.

Discussion/conclusions

The approach that we are taking with the Care@Home project differs significantly from the current engineering paradigm in many other technology driven projects. Our approach combines participatory and value sensitive design methods to ensure active participation of all stakeholders in decision making and design of new ICT-services that integrate care and social aspects. Thereby, it aims to develop human-centred services and to increase the acceptance of such ICT-service solutions which will lead to a sustainable care system, social inclusion and reduced healthcare costs in the long-term.

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