Multi-Stakeholder Requirements in Home Care Technology Design

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Abstract
The MATCH project (http://www.match-project.org.uk) is investigating how new technologies can maintain the independence of those receiving social and health care at home. A diverse network of stakeholders have been identified as benefactors of home care systems. Participatory design is an ideal methodology to allow multiple stakeholder involvement in the design of advanced home care technology. This work aims to develop and document methodologies to facilitate the elicitation of complex, dynamic, multi-stakeholder design requirements and needs in the home care domain. This paper presents the rationale for collaborative, multiple stakeholder participatory design and presents initial findings from stakeholder focus groups and design case studies currently in use within the MATCH Home Care Technology project.

Keywords
Home care systems, care at home, stakeholder requirements, participatory design.

ACM Classification Keywords
H5.2. Information interfaces and presentation: User centered design.

Introduction

In January 2006 the British government launched the White Paper “Our health, our care, our say” which identified the future importance of assistive technologies in offering support to those who had physical and/or cognitive difficulties and wished to continue living in their own home. New technologies have also been identified to improve the services provided by care organizations.

Advanced home care technologies and home care systems have not been taken up as eagerly as might have been anticipated. However, with an increasing ageing population and an increased drive to keep people out of hospital and support people living independently in their own homes, there is a continuing need for well designed, acceptable home care technologies.

This paper highlights the complexities of the home care domain that demand a new participatory design process for the collaborative multi-stakeholder design of home care technologies. We also present the lessons learned from a series of ongoing multi-stakeholder participatory design activities in the home care technology domain and present the lessons learned.

Case Study: Multi-stakeholder Design of Home Care technology

Home Care Systems, by their very nature, involve a number of direct users and other stakeholders, all of whom are interested in and potentially able to influence how the system should perform and behave. In addition to the person being cared for in their home, there are likely to be: partners living in the same space; friends and family living elsewhere who are involved in the care; visiting medical personnel such as community nurses; and remotely located medical staff, such as a consultant in a clinic that the patient visits. Each person involved in the system and its development is likely to have very different needs, perspectives, and accountabilities, all possibly changing over time as the condition of the person and the possible behaviours of the systems change. This can result in complex, dynamic and potentially conflicting needs and requirements. Therefore novel methods are needed for identifying and resolving requirements in home care technology design.

We define home care as a potentially linked set of services of either social care, health care, or both, that provide, or support the provision, of care in the home. Our focus is on technologically supported home care, in particular those that involve specialised computer systems. Such home care support can range from simple stand-alone electro-mechanical alarms installed in a person’s home, perhaps to indicate a bath overflowing or a door left ajar, to systems integrated into the home’s physical infrastructure that monitor patient state, perform sophisticated analyses, deliver customised information to patients and clinicians and support communication among them.

We refer to ‘Home Care Systems’ to mean the technology used to support and realise activities of the network of care, providing the means to collect, distribute, analyse and manage care-related information. Such technology typically includes sensors, displays, data, networks, and computing infrastructure.

We refer to a ‘Network of Home Care’ as the wide array of people and organisations involved or interested,

directly or indirectly, in a person's care at home. It is the complex nature of this network, and the associated social and professional interactions, that create many of the issues in the application of traditional design processes to the home care domain.

We are conducting a series of traditional and novel participatory design and requirements methodologies to both elicit requirements for our technology design within the MATCH project and to develop the existing methodologies to better suit the home care domain.

Multi-Stakeholder Focus Groups

Seven stakeholder groups have been identified by the MATCH project [ref] to directly benefit from home care technology developments. These are people with care needs, informal and professional carers, technologists, policy makers, and social and health care professionals.

Both single stakeholder and mixed stakeholder focus groups are being conducted to identify how MATCH technology may make a difference in the future management of care at home. Participants are presented with a scenario describing an older couple living at home with care needs. In a group discussion, participants are asked to identify the limitations of the couple that may eventually lead to a care home admission. Participants are then asked to think about how technology may play a role allowing them to remain at home for longer. The researchers are interested in 2 main issues: (1) Whether collaborating with different stakeholder groups can identify and resolve conflicting perspectives from different stakeholder groups surrounding their system needs that would remain unchallenged in single stakeholder focus groups, and (2) Identifying better informed user requirements that can be directly fed into the development of the MATCH system.

Multi-stakeholder Design Exercise

The aim of the design exercise is to provide a platform for different stakeholders to work together towards the common goal of designing a technology system to address the care needs from a given scenario. The collaborative design exercise allows the stakeholders to communicate and understand each others different requirements so that they can design a commonly agreed solution. From a research perspective we are interested in: (1) the design solutions reached, (2) the design process involved, and (3) the potential lessons learned from collaborative mixed stakeholder design.

Lessons Learned

We have identified several ways in which the different views of stakeholders can affect the successful design of home care technology.

They can have different perspectives on and expectations of the system under development; different backgrounds, which can cause communication problems in the design process; different objectives, which significantly influence views on the priority of requirements of the system; different abilities to express requirements effectively and document them using a technical platform; different involvements – for example, not all stakeholders can make decisions regarding care.

Based on our exploratory work and engagement exercises with stakeholders in home care we suggest that a design methodology for home care should provide or support the following features:

(1) Participatory and negotiated design.

(2) Distributed design.

(3) Iteration affording rounds of eliciting, balancing and validating requirements during design.

(4) Identification of and engagement with appropriate stakeholders to elicit high quality designs.

(5) Prioritisation or weighting of design requirements.

(6) Retention and traceability of design requirements over time.

(7) Identification and categorisation of design requirements conflict.

(8) Resolution of requirements conflict.

(9) Annotation of design requirements to enable both negotiation and traceability.

(10) Correlation with other processes and work practices such as care assessment.

Stakeholders/participants need a way to detect such misunderstandings and conflicts and resolve them as early as possible in the design process. Examples will be provided at the workshop.

Conclusions

Home care is a complex domain with many characteristics making it difficult to apply any one standard existing design methodology. Design methodologies must address the issues relevant to a range of stakeholders, be usable, be justifiable and fit into stakeholders current work practices and care plans. It should also be possible to elicit requirements at different levels of detail and to tailor the process to the resources available for the requirements exercise.

It is important to provide methods that support multiple and distributed stakeholders in the design and ongoing use of home care systems. Our methodologies thus far have focused on bringing together the various stakeholders of home care to collaboratively negotiate requirements or designs. We are currently developing tools and methodologies to support remote and distributed requirements and design such as Wiki-based tool for the design of home care technology.

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