Addressing Stakeholder Conflict in Home Care Systems

Marilyn Rose McGee-Lennon and Phil D Gray
Department of Computing Science
University of Glasgow
{mcgeemr; pdg}@dcs.gla.ac.uk

Ubiquitous and mobile computing technologies can provide novel and powerful support for home-based management or improvement of the well being of the ageing population living with care conditions in their own homes. However, such home care systems are not easy to design. In particular, such system are subject to potential problems arising from competing demands of different interacting stakeholders, resulting in potential failure or at least serious degradation of system effectiveness or user satisfaction. We present a conceptual framework for the representation of such stakeholder conflict in home care systems, identifying types of stakeholder, types and sources of potential conflict, and some initial ideas about how design methods and appropriately constructed system infrastructure might help with the identification, negotiation and resolution of such conflict.

Homecare systems, ageing population, mobile computing, multimodality, health care, stakeholder conflict.

1. INTRODUCTION

An increasing number of people, coping with a variety of illnesses, impairments or disabilities, age related or otherwise, prefer to stay in their own homes to receive care. This is both socially beneficial - they can remain in a familiar environment, close to family and friends - and economically beneficial – it is costly and impractical to provide sufficient specialized care facilities given the increasing ageing population. Increased access to the Internet and sophisticated networks of input and output technologies together open up possibilities for new forms of technological support to realise the goals of home-based care. Health indicators can be monitored, with alerts being sent to a carer or medical facility. Assistive technology can help those with disabilities cope with life in their own living space. The appropriate use of these advanced technologies can support care at home, but this needs to be done appropriately and with consent.

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 their design and use. There is the person being cared for well as potential others living in the home (perhaps serving as carers or requiring care themselves). Friends and family living elsewhere can either be involved in care or interested in its status. Visiting health and social care personnel such as community nurses as well as remotely located medical staff, such as a consultant in a clinic might also have a direct influence and/or interest in the home care system. Each person involved in the system and its development is likely to have very different needs, perspectives, and accountabilities, all possibly changing over time.

The challenges of stakeholder conflict are discussed here within the context of the MATCH project (www.match-project.org.uk). In this paper we aim to examine these conflicts from the point of view of home care system design and implementation, considering how the nature of home care technology can help identify and, ultimately resolve, them. We begin by describing in more detail the homecare environment and the stakeholders involved. We then identify particular types of conflict that can arise and consider some initial ideas on addressing such conflict.

2. HOME CARE SYSTEMS AND THEIR STAKEHOLDERS

Within MATCH 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 [6,7] that monitor patient state, perform sophisticated analyses, deliver customised information to patients and clinicians and support communication among them.

We distinguish between:

- the social and professional aspects of home care, including the people being cared for, the carers, and any external stakeholders playing a role in the care, which we call the *Network of Home Care*, and
- the technology used to support and realise the activities of the network of care, providing the means to collect, distribute, analyse and manage care related information. Such technology typically includes sensors, devices, displays, data, and networks, and computing infrastructures. Together we call this the *Home Care System.*

We identify the key stakeholders as:

- The person(s) being cared for
- Persons directly involved in care
    - *Usually a combination of friends, family, health and social professionals, and voluntary organisations that have a direct input to care program*

- Persons interested in care
    - *Persons in previous category that observe care either infrequently or remotely and that do not have a direct input to regular care program*
- Outsiders potentially affected by home care system
    - *E.g. a visitor to the home for reasons unrelated to care*

The key features of home care systems, from the point of view of this paper, are:

- Sensors provide data about the status of the cared person
- Home care can be multi-user and often collaborative
- Home care can be distributed
- Homecare system interaction can be mobile and multimodal

Given the multi-user, multimodal, potentially collaborative and distributed nature of Home Care Systems, it is likely that the software and system solutions will produce conflicts and challenges that ubiquitous research must address. This should be done in close collaboration with the stakeholders concerned.

3. CONFLICT IN HOME CARE SYSTEMS

3.1 Sources of Conflict

Conflicts might arise if the user(s) of the system misinterpret other user(s) intentions or interactions and/or the systems intentions or interactions. In order for home care systems to minimize the damage these conflicts can potentially cause, they have to be identified and described in such a way that their structure and characteristics are revealed with respect to potential resolution. We present an initial identification of some examples of sources of conflict, to illustrate their likely structure and variety. These and other examples will be discussed in more detail at the workshop.

- Shared Interaction Spaces
- Multiple care conditions
- Service quality versus user experience
- Control and use of data
- Accountability
- Volatility of behaviour and belief

3.2 Consequences of Conflict

The possible consequences of conflict are:

- System failure
- Poor Usability
- Difficulty in providing autonomic configuration

4. CONFLICT IDENTIFICATION, NEGOTIATION AND RESOLUTION

Stakeholder conflict has been identified as a potential threat to the realisation of effective and usable home care systems. We propose that solutions involve improving the identification, description and resolution of these conflicts. These potential solutions, or partial solutions, will be discussed in more detail at the workshop.

Technological solutions can include:

- Modifying sensing or interaction technologies.
- Enhancing the network policy languages for networks being built for homecare systems
- Developing configuration/monitoring tools that are based on patterns of care and system models

System design-oriented solutions can include:

- Participatory design of the home care system
- Augmenting activity, requirements & system models to enable conflicts to be identified and dealt with effectively
- Languages and prototyping tools to support system models.
- Identifying and categorising patterns of care at home within these networks and ultimately developing a pattern language to support this and enabling future home health care systems to be built successfully

Configuration Oriented Solutions involve:

- Enabling the system to be configured appropriately at run-time
- Enabling structural evolution of the system based on patterns of care and patterns of use
- Allowing negotiated personalisation of the system
- Allowing sharable components for editing and monitoring system status

Social and Clinical solutions involve inviting multiple users and stakeholders to feed into either or both of participatory design of the home care system and the ongoing configuration and evolution of the home care system. We believe this to be an important area for research in order for the potential of Home Care Systems to be fully realised.

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