Addressing Challenges of Stakeholder Conflict in the Development of Homecare Systems

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1 Introduction

In this position paper we identify particular types of conflict that can arise in home care systems and consider ways in which system development methods and tools can address the satisfactory resolution of such conflict. We conclude by presenting our proposed future work.

2 Home Care Systems and Their Stakeholders

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 in this paper in 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*.

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

- 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 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.

3 Key Issues and Conflicts

3.1 Sources of Conflict

Conflicts might arise if the user(s) of the system misinterpret (a) other user(s) intentions or interactions and/or (b) 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. What follows is not intended as a comprehensive and complete analytic model of such conflict, but merely an initial attempt to examine some examples, to illustrate their likely structure and variety.

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

3.2 Consequences of Conflict

- System Failure
- Poor Usability
- Reluctance to use/accept system
- Difficulty in providing autonomic configuration

4 Conflict Identification, Negotiation and Resolution

Stakeholder conflict is a potential threat to the realisation of effective and usable home care systems. Solutions involve improving the identification, description and resolution of these conflicts. In this section, we present some initial ideas about how this might be accomplished. These potential solutions, or partial solutions, to stakeholder conflict, include technological solutions, socially or clinically negotiated, or implemented at a system design level, or some combination of these.

4.1 Technological

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

4.2 Social and Clinical

Social and Clinical solutions can be derived from some combination of the other solutions. Where appropriate, multiple users and stakeholders are invited 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.

4.3 System design-oriented Solutions

- Participatory design of the home care system
- Develop or augment activity, requirements and system models to enable conflicts to be identified and dealt with effectively
- Languages and prototyping tools to support system models.
- Identify and categorise patterns of care at home within these networks and ultimately develop a pattern language to support this and enable future home health care systems to be built successfully

4.4 Configuration Oriented Solutions

Instead of trying to resolve the conflicts at design time, they might be addressed by enabling the system to be configured appropriately at run-time. Given our earlier observations about the difficulty of identifying conflicts before users have experience the system, this approach is perhaps the most important but also one of the most demanding in terms of changes to home care system development. The challenge here is to make it possible to change the functionality and the interactive appearance and behaviour of the system, more or less fundamentally, at an acceptable cost to the user(s) and/or stakeholder(s).

Furthermore, while personalisation seems a key requirement for configuration oriented solutions, it can also exacerbate the problem if handled incorrectly [2]. If one stakeholder is allowed to personalise the system for themselves this may create a conflict with another. Thus personalisation has be implemented in such a way that conflicts are notified during personalisation, if possible and/or personalisation is performed in a collaborative way, enabling all relevant stakeholders to contribute to the final configuration decision.

We believe this to be a key research challenge for home care system software, requiring a solution that exploits the notion of dynamically reconfigurable self-describing components in a framework capable of supporting structural evolution and incorporating sharable components for editing and monitoring system status [e.g. 5].

5 References

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