

# The Development of ICT based services for ageing people needs co-operation (ISG'08)

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**Abstract**—Already in the beginning of the last decade it was noticed that our society is ageing and new kind of partnership will be needed to develop both services and technology. Therefore new concepts must be developed and they must be taken into a use to ensure that people needing services can also reach them. Elderly people are eager to use new services and new technology if it will support their daily living at their own home. In the coming years it is even more important than earlier that private and public sector are in close cooperation and are together responsible for the development work concerning also health care and social welfare applications. Because of the complexity of the topic there is a need to use different kind of methods and so to achieve multidisciplinary information to be used by decision makers.

## I. INTRODUCTION

TECHNICAL Research Centre of Finland (VTT) and Technical University of Tampere, Finland (TUT) started a three years project, 'Smart Home in a Suitcase, new technologies supporting telemedicine, home care, rehabilitation and safety at home' in December 2005. This project, called UUTE, will end by the end of 2008.

Already in the project planning phase research institutes realised that it will be important to carry out this project together with different kinds of partners. The aim was to identify both public and private organisations which are interested in developing services and technology for ageing people. The idea was to develop and establish a new kind of network between partners which will join the project consortium. After negotiations with 10 to 15 candidates the project consortium was established.

Partners representing public health care and special health care organisations in the project are: Pirkanmaa Hospital District, Tampere University Hospital and Lempäälä Health Care Centre. Private companies represent information technology, building development for seniors, technology assisting independent living and home care services. A company providing first aid (ambulance) and safety services and a company interested in balance and walking problems joined the project during

spring 2007.

During the first phase of the project the co-operation between Pirkanmaa Hospital District and research institutes started with meetings concerning especially the care of cardiac patients. Also, the first scenarios written in the project were concerning the services for cardiac patients [1]. Later on it was decided that the target group should be elderly people having problems with their balance or difficulties to walk with or without assisting devices [2]. It was decided that this group should include also people having experienced falls. There were two reasons to do the decision: 1) the number of elderly people is growing fast and their use of health care services will expand also and 2) it would be beneficial to prevent possible fallings because it would diminish health care costs. This was taken into account when developing the scenarios further [3].

## II. AIM OF THE PROJECT

The aim of the project is to develop a general technical platform for personally adaptable solutions that will support a person in different living conditions at home. It should support a person to follow-up his or her physical condition during home exercises or at a training centre. One basic objective is that health care personnel can support an outdoor patient at his homecare after hospitalization phase.

Because of the challenge to provide good health care services including rehabilitation and safety services for a growing number of elderly people, more co-operation is needed between public, private and so called third sector actors.

In Finland, municipalities are responsible for arranging the health care and welfare services, but they can organise the services together with different kind of partners. As one example of the possible network in the future can be seen the co-operation between actors in our project as illustrated in the Fig. 1 (integration into services provided by the participating organisations).

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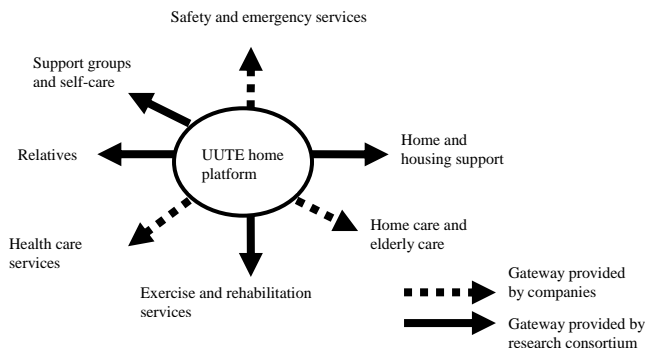


Fig. 1: integration into services provided by the participating organisations

### III. METHODS

The project has used different kind of research methods from the viewpoints of technical, medical and human sciences.

#### A. Management group meetings

Management group meetings are used as a guidance tool and a platform for interactive conversations. The group's members represent all partners involved in the project. The group has their meetings almost every third month. The discussions connect each others' viewpoints and aims of the project. All the material delivered during these meetings has been available also on a Moodle course management system (CMS). Moodle is a free and open source software package designed using sound pedagogical principles, to help educators and actors create effective and beneficial online learning communities [4]. The UUTE community was created and is supported by Technical University of Tampere.

In the beginning of the project the community was quite active, but during the project it turned out that the use of email messages was a more popular and efficient way to share information and ideas.

#### B. Interviews

Because of the nature of the project it was realized that different kind of data collecting methods should be used. It was decided to interview people as focus groups and personally people who could represent presumed users of new services and services combinations based on technical solutions and technical environment.

Group interviews were used in the evaluation process of the scenarios. Groups represented four health care centers which are located in different sized municipalities. The number of inhabitants in the municipalities ranged from 4 000 to 28 000. They all are located in the area of Pirkanmaa Hospital District.

The number of members in each group was 3-4 and they represented different professionals, for example administration, medical doctors, nurses and civil servants. It was found out that opinions of different viewpoints are

important. Based on the answers we could decide what to do in the coming phase of the project work.

One task for professionals was to evaluate, whether the presented scenarios are beneficial, needed and desired or not. During the conversation also the attitude of group members was evaluated.

Another kind of interview process was carried out with the presumed users. Interviews based on a questionnaire that included open and structured questions were carried out together with Berg Balance Scale test (BBS). The number of interviewed patients was 15. Some of these results are reported in [5].

Both group interviews and personal interviews were recorded. All the interviews were carried out together with two or three researchers.

#### C. Scenario method

The scenario method was chosen because scenarios are a flexible way to collect user attitudes, opinions and needs quickly. One obvious benefit of scenarios is that they treat technology quite flexibly: either it can be presented in detail or on the other hand the focus can be on the context of use. A basic scenario consists of a narrative that describes the use of a certain product. A scenario should portray 1) the users, 2) the situation where the product or service is used, 3) the ways and customs of usage, 4) the basic functions of the product and/or service and 5) the benefit the users get. [6].

The research team produced eight different scenarios which were collected and discussed together with researchers and with the project management group. During the first phase it was emphasized that the viewpoint should be focused on the people suffering from heart disease. The scenarios were written on the basis of a literature survey, expert interviews, and visits to care facilities and services. Based on discussions some elements of all scenarios were picked up and as a result one scenario was written. In that scenario all selected elements were taken into account.

Later on, the theme of the second phase scenario was decided in the management group meeting. The decision was that the project should concentrate on people who have problems with their balance and gait and who possibly are using some technical devices in their daily life.

The heart scenario was evaluated by the personnel of health care centers in the end of group interviews. The number of interviewed people was 11. According to their opinions a new way to produce services supporting patients and their rehabilitation at home is welcome. Based on the scenario assessment the scenario combining ICT and services was convincing and desirable. They saw that the described situation could be a solution for the future, if the aim is to support aging people at home. Eight of eleven said that new possibilities especially for home care and home support are also needed and wanted. Nine of eleven personnel members shared the opinion that the suggested solution is ethically acceptable and two people

had their suspicions.

#### *D. Questionnaires*

The use of a questionnaire is a common method in multidisciplinary studies. It was also used in this project. One questionnaire was designed to collect the data from the personnel working with the patients having neurological deceases. 45 questionnaires were sent to the health care personnel working at two different departments in Tampere University Hospital. The other department was concentrating on rehabilitation and the other was a neurological care unit. The questionnaires were sent in March and in the beginning of April. So far we have received 23 completed forms.

Our purpose was to clarify for example what kinds of technologies the personnel is using, what kinds of technologies they like to have and are their willing and interested to use new technical solutions if they are useful at work.

The results show that 19 of 23 were interested in new technical solutions and applications if they will be helpful at work and will support rehabilitation at home and also the follow-up of rehabilitation. According to the opinions these devices and solutions should be simple, solid, easy to use and easy to learn also from the patients' point of view.

The forms were filled up by 14 nurses, five physiotherapists, one speech therapist, one occupational therapist, one social worker and by one practical nurse. Given answers will be analyzed further before summer 2008.

#### *E. Workshops and seminars*

During the project two different types of workshops and seminars were arranged. One was meant for people involved to the project and the others for all the people working as health care professionals at the Pirkanmaa Hospital District. Workshops have been used as a tool to produce ideas for scenarios and information for the decision makers concerning the project. The nature of the seminars was informative and the aim was to exchange opinions and support networking between different actors.

Both workshops and seminars have received good feedback even though the number of participants was under 30. The seminars have offered a good environment to discuss about the future challenges for the education of health care professionals. More technology and technology-based processes will be included to the patient care chain. This means that the curriculums in different schools must be developed and evaluated for future purposes.

The UUTE project recommends that more cooperation concerning information delivery should be done between schools and research institutes. There is also a need to develop common understanding between these actors and between companies acting on the field of health care

services and technology.

#### *F. Testing and piloting the prototype with out patient and elderly people*

Piloting and testing phase of the project will be carried out in cooperation with the Tampere University Hospital and with the local health care center in Lempäälä municipality. Also all project partners have their own role in both phases. This way we can be more confident that achieved results will be delivered wider to the field.

The building development company YH Länsi has shown one department for this purpose. By the end of May, 2008 an elderly renter will move in to the department. Before that a technical platform will be installed, piloted and tested by researchers. The service concept will be built up together with the coming renter. The testing phase with the renter will continue to the end of June. One idea is that we could carry out a new testing period together with the renter, if he or she will agree to the request.

The second testing phase will be carried out after summer time in Lempäälä. There will be a linkage between health care center and a house. It has not yet been agreed which patient(s) will participate. The participant should be a senior citizen and able to live at his or her own home using technical devices or without them. One condition is that he or she will need rehabilitation or will be a user of some health care services.

During the testing periods both testing persons should keep a diary in which they should write some sentences of their daily life and experiences concerning the technology installed in their use. Comments on the used services are collected also. Based on the comments and experiences the service concept will be developed further.

The expected result should show that new service concepts based on the use of technology are beneficial for out patient care and would also give new working possibilities for health care professionals. One aim is to convince decision makers that there is a need for new solutions and new kind of cooperation between private and public sectors.

## IV. RESULTS AND DISCUSSION

So far the results show that it is beneficial if ICT based applications and services meant for elderly people are developed in co-operation with different kind of actors. The need of services varies a lot among elderly people. Because of the variation it was important to take into account physical, mental and social factors when developing new technical solutions and services based on technical development.

It was found out that it is important to discuss with the representatives of health care personnel if you like to carry out a proper research process among patients and personnel. The personnel should be informed on the aim

of the project because nowadays the staff is working under quite a pressure and the time is limited for extra work. Motivation is a big issue that must be considered.

It is also very important to take into account the opinions and expectations of patients and elderly people if the aim is that they are willing to use new services based on technology.

Both professionals and elderly people are eager to participate in different kind of development work if they are motivated and interested enough and if they see that in the future there might be new ways to work or new ways to get and use services at home.

Based on the results achieved it can be expressed that our network and co-operation has been beneficial for the development work carried out within the project.

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