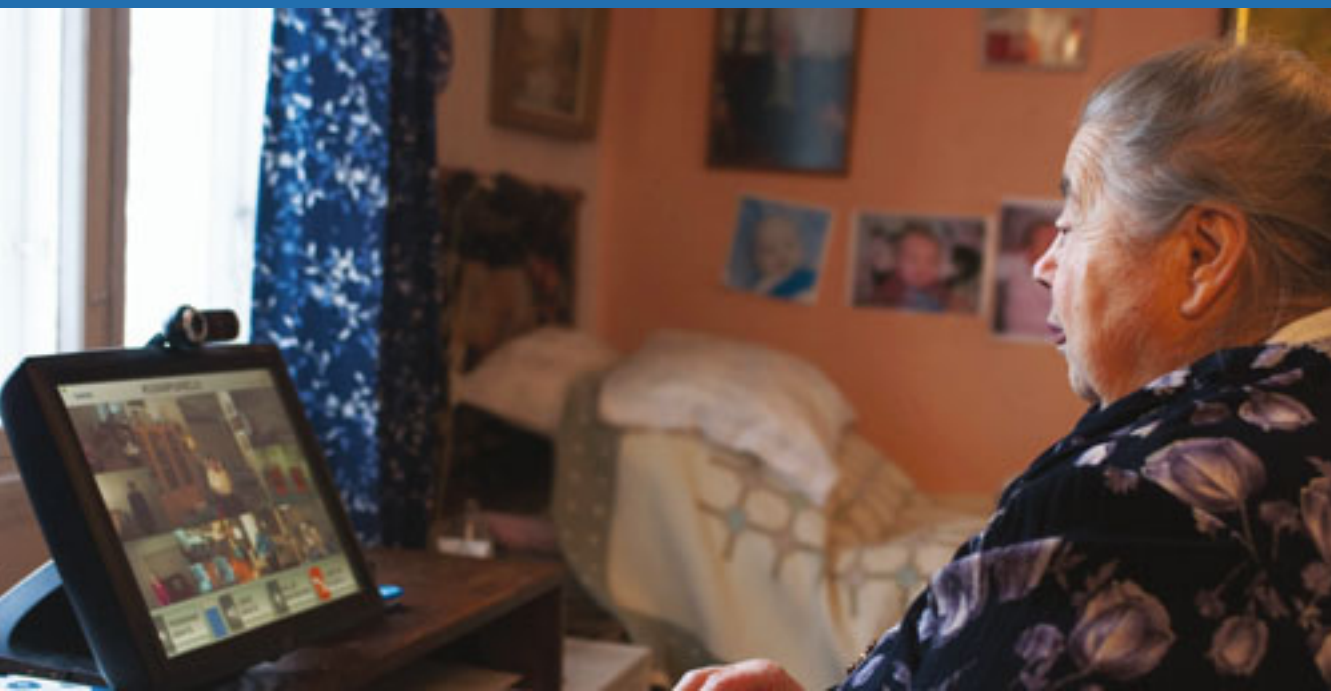


Paula Lehto and Johanna Leskelä (eds.)

INTERACTIVE CaringTV® AND USERDRIVEN eSERVICES

The Safe Home Project: Final Report



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**Interactive CaringTV® and
Userdriven eServices
The Safe Home Project:
Final Report**

Paula Lehto and Johanna Leskelä (eds.)

2011 Espoo



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Abstract

The Safe Home project is funded by the European Regional Development Fund (EU/ERDF) and implemented in the regions of Uusimaa, Kymenlaakso and SouthWest Finland between 1st of September 2008 and 31st of August 2011. The project consists of two subprojects: the Ehyenä project in Laurea University of Applied Sciences, and the Omana project in Turku University of Applied Sciences. The Safe Home project was coordinated by Laurea. The City of Espoo and the City of Turku were key partners in the project. Business partners include Videra Ltd, Medixine Ltd, Everon Ltd, ArctiCare Ltd, FysioSporttis Ltd, Lääkärikeskus Yhtymä and Medineuvo Ltd (ad. 29 September 2010).

The purpose of the Safe Home project was to study, develop, produce and evaluate eWellbeing services with various focus groups; to promote welfare, rehabilitation and support independent living at home. The project produced interactive programmes and selected eWellbeing services through CaringTV® or alternative technological solutions. The aim was to produce virtual wellbeing services to support the focus group's daily life at home and enhance participation in group activities.

The project was based on action research approach and userdriven methods. CaringTV as an interactive concept is developed with various partners and participants in private homes, assisted living facilities and residential units.

Collaboration between clients, students, municipalities, business ventures and third sector partners evolved into a development process of CaringTV and other usable technologies. The participants in the project included the elderly (N=176), families with small children (N=4) who were clients of child welfare services, young people who were clients of child welfare services and lived in family support centres (N=28), mental health rehabilitation patients (N=4) and disabled persons (N=12). In addition, experts (N=105) from different operating environments were actively involved in the development work.

All the participants were both service users and concept developers. Data collection was conducted through individual interviews, focus group interviews and workshops. Programme themes for CaringTV and eService concepts were developed from the collected data. Data analysis was conducted mainly through qualitative content analysis. Programmes and eServices have been developed and tested with different partners based on continuous assessment in line with the action research approach.

The participatory programmes consisted of coordinated activities, interactive discussion programmes and meetings with experts. Piloted eServices included eDoctor, eNurse and ePhysiotherapist consultation services. ePharmacist, eClubs and virtual calls were also piloted. Interactive image-based services were developed and tested as part of the project. These included long-distance monitoring systems, security systems and e24h services. The outcome of the research is the userdriven conceptual model of CaringTV. The model consists of promoting factors, inhibiting factors, content and methods and the meaning of CaringTV. Key concepts of the userdriven model are participation, interaction and empowerment. Project outcomes also include processes and cost calculations for selected eServices, evaluations by the clients, and evaluation of competences.

The existing challenges relate to developing CaringTV and other technological solutions to meet the expectations of different client groups and to correspond with the availability of eWellbeing services. Successful transfer of the CaringTV concept requires close collaboration with local authorities and different service providers. The productisation of the concept is another challenge. Further research is needed into the development of new eWellbeing services, the availability of services, service/client processes, and systematic evaluation of costs and effectiveness.

Keywords: CaringTV, eService, health, userdriven, virtual service, welfare technologies, wellbeing

Foreword

The Safe Home project is continuation of other development projects previously implemented at Laurea, including the Coping at Home I and II and the KOTIIN (Going Home) projects. All projects were aimed at developing new operating models for home care to support independent living for the elderly. The technological tool in all projects was CaringTV. The societal importance of these activities was highlighted in the latest national forecast for labour and educational needs, which concluded that it will be impossible to train enough workforce for care services. For that reason, it is imperative that "lighter" forms of care, prevention, and other solutions are developed in Finnish public health care to reduce the need for institutional care and to secure the availability of essential services.

The project objectives included further development of the CaringTV service concept, the production of userdriven and customised eServices, and a new operating model for the provision of welfare services using welfare technologies. The Safe Home project ran from 1 September 2008 until 31 August 2011.

The project has broadened the range of services produced for CaringTV both in geography and content. The project comprised two subprojects: EHYENÄ, coordinated by Laurea UAS, and OMANA, which was coordinated by Turku UAS. Project focus groups included family/youth clients of child welfare services, disabled people, mental health rehabilitation patients, and elders and family caregivers in the cities of Espoo, Vantaa, Turku, Salo, Laitila and Kouvola. In addition to local authorities and universities of applied sciences, project partners included the following businesses and organisations: ASPA palvelut Ltd, Helsingin lyhytaikaiskoti ja työpaja Lyhty ry., Auralan Setlementti ry./S-Kotoset, Turun lähimmäispalveluyhdistys ry Kotikunnas, Laitilan terveyskoti, Videra Ltd, ArctiCare Technologies Ltd, Medixine Ltd, Everon Ltd, Medineuvo Ltd (until 29 September 2010), FysioSporttis Ltd and Lääkärikeskus Yhtymä. The project was funded under the European Regional Development Fund of the European Union. The funding was provided through the Regional Council of Päijät-Häme.

The development project included research into the users' experiences from new operating models and services. An important part of the project was the introduction of students to new methods and operating models. Several theses were produced as part of the subprojects. The pedagogical LbD (Learning by Developing) model was used to combine the project objectives and the learning

objectives. The best way of reforming operating models is to ensure that new graduates adopt them during their studies.

An important question is how the activities can be continued after the project finishes. The technologies and operating models are in place, but funding is difficult to come by. Clients who have been involved in the project have understandably expressed their concerns about whether the services will continue. These services would offer an ideal application for the care service voucher scheme that is already in place in many municipalities. Implementing these forms of services in a wider area would require increasing the limits of patient contribution. The society cannot pay for everything, but it should provide the channels for making services available. The final report is aimed at disseminating the new operating models and practices produced in the project.

The vast partner network has required flexibility and openness from all partners and participants. As the chairman of the project steering group, I would like to express my gratitude to all those who have been involved and give my special thanks to project coordinators Paula Lehto, Johanna Leskelä, Esko Ovaska, Ari Poikola, Outi Rantala and Elina Vuorio.

Vantaa, 2011

Pentti Rauhala
President, docent
Laurea University of Applied
Sciences

Foreword

Strong Pedagogical Link between Applied Research and Development

Universities and Universities of Applied Sciences are not substitutes for one another. Instead, they complement each other. Likewise, not all universities of applied sciences are the same. They have different characteristics that depend on their operating environments, structures and circumstances. These are described in the university's strategy and quality system. Universities aim to exploit these characteristics in order to improve their competitiveness, to adapt their activities based on regional needs, and to increase their wider influence. Each university has defined its own profile to describe these qualities in line with the recommendation of the Ministry of Education.

The Safe Home project was implemented using the Learning by Developing approach developed by Laurea University of Applied Sciences, the project partner of Turku UAS. Learning by Developing (LbD) is an integral part of Laurea's profile. At Laurea, the LbD approach is aimed at producing new competences in line with the university's profile, in the form of new products, operating models and workplace cultures. Development projects carried out to support regional development provide a learning environment where new knowledge and competence are gained by both the individual (student) and the community.

Turku University of Applied Sciences has chosen and developed innovation pedagogy as its profile based on a multidisciplinary approach that promotes userdriven innovation. The pedagogic approach supports innovation which can be exploited at workplaces in the SouthWest region. Flexible curriculum structures and alternative forms of completion enable the university to incorporate R&D, entrepreneurship and internationalisation into its study programmes while ensuring regulatory quality. In innovation pedagogy, communal and network-based learning are emphasised alongside personal learning.

The two universities have very similar pedagogic approaches: both focus on individual, communal and network-based learning in applied research and development activities that support regional development. However, compared to the Learning by Developing approach, innovation pedagogy focuses on a more multidisciplinary approach that is characteristic of userdriven, innovative development projects promoting regional development. Furthermore, innovation pedagogy emphasises flexible curriculum structures and the promotion of

entrepreneurship and internationalisation - integral elements of the activities of universities of applied sciences.

Finnish Universities of Applied Sciences have developed their pedagogic approaches to ensure that study programmes incorporate applied R&D activity, support regional development, and provide students with knowledge of project development and management. The integration of applied R&D into education is a national characteristic of universities of applied sciences which lacks clear international examples. Universities focussing on basic research have not been able to offer sufficient pedagogic resources for the development of UAS education.

The Safe Home project was aimed at developing electronic wellbeing services for the elderly, family caregivers, mental health rehabilitation patients, the disabled, and family and youth clients of child welfare services. This exemplary project contributes significantly to both universities' profiles as promoters of regional development.

Turku, 2011

Juha Kettunen
President, docent
Turku University of Applied
Sciences

Authors

Paula Lehto
Principal Lecturer, PhD
Laurea

Johanna Leskelä
Project Manager, MSc.
Laurea

Ari Poikola
Project Manager
Safe Home project, Laurea

Riitta Matero
Project worker
Laurea

Hanna Kantell
Project worker
Laurea

Katja Tikkanen
Project worker
Laurea

Ville Nieminen
Assistant
Laurea

Annika Isaksson
Assistant
Laurea

Päivi Immonen-Orpana
Development manager, PhD
Laurea

Elina Vuorio
Project Manager,
M.Soc.Sc.
Turku University of Applied
Sciences

Mika Arvola
Financial/technical
Coordinator
Turku University of Applied
Sciences

Kaisa Jokela
Project Planner, MA(Ed)
Turku University of Applied
Sciences

Jaana Ylitalo
Project Coordinator
Turku University of Applied
Sciences

Päivi Saalasto
Senior Lecturer, MSc.
Turku University of Applied
Sciences

Photography: Laurea UAS and Turku UAS

1 Introduction

Technological development facilitates innovation and the creation of new services for the welfare sector. The European Union has funded a number of research and development projects aimed at developing and supporting new digital services. The projects are aimed at finding new solutions and answers to existing social challenges such as the aging population, increasing rates of chronic illnesses, rising public spending, and shortages of healthcare workers. According to Topo (2008) and others, the objective of research and development of welfare technologies is to maintain and prevent deterioration of functional abilities and to improve and coordinate the way welfare services are delivered.

The European Commission has published the Public Consultation on the eHealth Action Plan (eHAP) 2012-2020, which highlights the following areas:

- Improving awareness of the use of electronic services
- Wide-ranging use of services
- Solving technical interoperability issues
- Improving legal security
- Supporting innovation and research.

CaringTV® is an innovation based on research. It has been developed under three different RD&I projects. The research and development activities are conducted through an action research approach (see. e.g. Lehto 2008, Raij & Lehto 2010). In action research, different actors are active participants of the development process. In real life situations and contexts, new knowledge or action is produced in a cyclical process. In action research, the developers work with the actors to examine the background to the activity, and to review and develop solutions to solve problems based on the objectives (cf. Aaltoila & Syrjälä 1999, Kuula 2000, Heikkinen 2001.) The actors of the CaringTV project included different user groups consisting of clients, relatives, social and health care experts, partners and students.

The Safe Home project was funded by the European Regional Development Fund (ERDF). The project was implemented in the Uusimaa, SouthWest Finland and Kymenlaakso regions. The main partner and coordinator was Laurea University of Applied Sciences. Turku University of Applied Sciences took part in Safe Home with its own subproject. The objective of the Safe Home project was to research, develop and produce different types of eWellbeing services using

the CaringTV system and alternative technologies to support different client groups in their ability to live independently. Collaboration between clients, universities, municipalities, business ventures and third sector partners evolved into a development process of CaringTV and other usable technologies. The aim was to produce virtual wellbeing services to support the clients' daily life at home and enhance participation in group activities.

The project research was based on the action research approach and user driven methods. Action research is highly suitable for testing and piloting new technological solutions (cf. Hyysalo 2009, Kuula 2000). At its best, thanks to its dynamic process, action research can be a self-correcting and generating approach. In action research, data is collected from different actors in different stages of the process. Activities are planned based on the collected data and revised according to evaluations. A userdriven approach and the LivingLab approach are the cornerstones of European R&D and innovation today. Hyysalo's (2006) method for examining the user experience and its different aspects was used as a reference framework in the Safe Home project. User research also included a case study which provided a means for testing and producing interactive programmes and eWellbeing services for different groups in real environments. In the context of ethics, the different focus groups of this project were highly demanding and vulnerable.

The starting points, methodological solutions and outcomes of the project are presented in this final report. The interactive programmes of CaringTV and the chosen eServices are described by focus group. The results are examined from the point of view of the elderly, family caregivers, the disabled, and the clients of child welfare services and mental health rehabilitation services. Genuine examples of interactive programmes, eServices, technological solutions and new work methods are described using the case study. In evaluation terms, the meaning of CaringTV and other technological solutions is assessed by means of a customer survey and userdriven test results. Process models and costs for two eService concepts produced as part of the project are presented using process descriptions. Competence development is examined both from the experts' and the students' point of view.

2 Safe Home Project

Ari Poikola

The Safe Home project consists of two subprojects: Ehyenä and Omana. Under this project, collaboration between clients, universities, municipalities, business ventures and third sector partners evolved into a development process of CaringTV and other usable technologies. The purpose of the Safe Home project was to study, develop, produce and evaluate eWellbeing services with various client groups; to promote welfare and rehabilitation, and to support independent living at home. The participants included elderly people, family caregivers, mental health rehabilitation patients, disabled people, and family and youth clients of child protection services.

The project was based on the action research approach and Laurea's Learning by Developing model. The participants included clients, students, welfare experts, partners and businesses. The technological solutions included the interactive CaringTV, telecare systems, safety circuits and remote monitoring devices such as weighing scales, blood pressure and glucose monitors. The project's outputs included programme contents and selected eServices. In addition, project participants researched, tested and produced models for the 24h eService concept and the related processes and their cost-effectiveness.

The project partners included municipalities and third sector operators. These partners had a dual role in the project: On one hand, they provided a test environment for the activities and produced content in the focus groups' everyday lives; on the other hand, they were involved in producing contents and eServices to the client groups taking part in the project. In joint content production activities, the aim was to utilise the expertise and local knowledge of different actors in the best possible way.

The project results have been presented in various national and international seminars, conferences and events. A number of theses were produced under both subprojects. The project has had a lot of interest in the media, and a number of articles have been written about it. (Appendix 1).

2.1 EHYENÄ Subproject

The Ehyenä subproject was aimed at developing new preventive eServices from a userdriven approach in the Uusimaa and Kymenlaakso regions. The objective

was to research, develop and produce different eWellbeing services using the CaringTV system and alternative technologies to support different client groups in their ability to live independently.

The subproject was aimed at

- improving the quality and effectiveness of services by producing new preventive eServices
- researching, developing and modelling sustainable welfare processes for different focus groups along with models and co-participatory services from a userdriven approach
- productising the programme contents of CaringTV, eService contents and services
- piloting the implementation of eServices as a 24h service
- demonstrating the cost-effectiveness of the eService concept with selected eServices
- researching, developing and testing alternative eService interfaces.

Interactive online services were developed and tested as part of the project. These included telemonitoring systems, security systems and e24h services. Various programme contents of CaringTV, eService contents, and services were productised as part of the project. The project outputs include descriptions and models for the service processes, and their cost assessments.

The client groups included elderly people (living at home or in service houses), families with small children who were clients of child welfare services, youth clients of child welfare services living at home or participating in group activities, mental health rehabilitation patients living in residential units, and people with developmental disabilities. A total of 136 clients and 77 experts took part in the subproject.

Laurea University of Applied Sciences is responsible for the overall coordination of the Safe Home project and for the subproject carried out in Uusimaa and Kymenlaakso regions. Equipment suppliers are Videra Ltd, Everon Ltd and Medixine Ltd. A total of 44 CaringTV systems supplied by Videra were used in the project (a touch screen version, mobile version and Broadcasting Centre). Other technologies used in the project include the remote monitoring packages supplied by Medixine (blood pressure and weight scales) and security solutions provided by Everon. Other business partners included Lääkärikeskus Yhtymä Ltd, FysioSporttis Ltd, and Medineuvo Ltd (until 29 September 2010).

The organisations that took part in the subproject were the social family services, social welfare services and services for the elderly from the City of Espoo, certain units of ASPA Ltd from Kuusankoski and Kouvola, and the Helsinki-based housing service Lyhty ry.

2.2 OMANA Subproject

The objective of the subproject was to take a proactive approach and to further promote the guidance and counselling service concept of CaringTV, which was developed as part of the KOTIIN project under the InnoELLI Senior 2006-2008 programme, in SouthWest Finland. Further welfare technologies were also tested with the addition of telecare and security solutions. The primary objective was to develop userdriven guidance and counselling service concept based on action research, and to diversify and pilot the activities with different focus groups among the elderly. The project was carried out in close collaboration with the previous partner network, and further partners were included to broaden the range of services. The inclusion of telecare solutions for relatives in the eServices was a particular strength of the subproject.

The main objectives of the subproject were:

- To further develop the guidance and counselling concept in SouthWest Finland using an action research approach and userdriven methods by extending and diversifying the services both internally (Turku UAS) and externally (partners such as Palvelukeskus Kotikunnas, Aurala, Laitilan Terveyskoti, and the cities of Laitila, Salo and Turku).
- To promote the activity at local level as part of workplace cultures in services for the elderly, among family caregivers, and in long-term/rehabilitation care, and as part of multidisciplinary activities (across degree programmes/departments) at Turku UAS.
- To test technological solutions designed for communication between elders and their relatives.

The clientgroups of the OMANA subproject included elderly home care clients and family caregivers, patients with long-term illnesses, clients of rehabilitation services, and elderly clients of service houses. A total of 91 clients and 28 experts took part in the pilot and action research for the virtual guidance and counselling service concept.

Videra Ltd and ArctiCare Technologies were selected by a tendering process to provide the technologies for the pilot. Four CaringTV® units and four telecare units provided by ArctiCare were used in Laitila by elderly clients of the municipal home care services. In addition, one CaringTV unit was installed in the day room of Laitilan Terveyskoti for elderly clients. In Salo, seven CaringTV units were tested in the homes of elderly family caregivers. In Turku, the focus was on piloting the CaringTV units in service houses and day centres. The units were tested in communal areas at the facilities of Aurala, Kotikunnas, Lehmusvalkama and Portsakoti.

During the project, user feedback was regularly collected from the focus groups in line with the action research approach of the Safe Home project. In SouthWest Finland, the focus group was selected with the aim of supporting clients who already needed support in order to be able to live independently, while considering the future users of services (the clients of the peer group). The subproject provided added value by developing contact between elderly clients and their relatives using CaringTV and telecare technologies. The interactive video connection between the elders and relatives who took part in the pilot gave users new ways to be involved in each other's everyday lives.

Workplace partners included local authorities such as the City of Laitila (social and health services/home care), the City of Salo (services for the elderly and family caregivers), and the City of Turku (social and health care/service houses), the Kotikunnas assisted housing centre of the Association for Vicinity Services in Turku, Laitilan Terveyskoti and Aurala. The organisations participated in the project by testing the CaringTV and/or telecare systems and the eServices provided via these technologies in non-institutional social and health care services, in informal care (family caregivers), and in service houses/day centres.

3 ACTION RESEARCH AND USERDRIVEN METHODS IN THE SAFE HOME PROJECT

Paula Lehto

3.1 Safe Home Project - Background

The Socially Sustainable Finland 2020 strategy for social and health policy continues to emphasise seamless cooperation between experts and citizens. In particular, cooperation is called for to address the issues related to the aging population, mental health and substance abuse services, and children and young people at risk of social exclusion. The aim is to utilise communication technologies and new forms of service to promote coping and independent living. (Socially Sustainable Finland 2020).

Accessibility, availability and independent living are important social concepts. In Finland, a number of reforms have taken place in the provision and allocation of social and health care services over the last decade. The previous government programme already placed emphasis on userdriven, comprehensive and effective social and health care services and implementing best practices through close cooperation within the social and health care sector. The programme commits to ensuring good care services for the elderly and providing preventive services. Specifically, the aim is to promote home care, the associated support services, and the independent coping and living of the elderly. Other development areas include informal care and the creation of a comprehensive counselling and service network for the elderly across the country. (Government 2007a.) Promoting the wellbeing and health of elderly people is a key objective (Government 2007b). The national KASTE programme also puts focus on issues related to the elderly. The Health 2015 public health programme notes that illnesses can be prevented and the functional abilities of elderly people can be promoted and rehabilitated to support their autonomy. The elderly should have opportunities to develop their skills, knowledge and abilities related to self care and to live as independently as possible with a high quality of life and sufficient financial means. Living environments, local amenities and transport facilities should be developed and new technologies exploited to support independent living and access for all elderly people. Similar objectives can be found in the quality recommendation on services for the elderly which was updated in 2008 (in Finnish: Ikäihmisten palvelujen laatusuositus 2008).

The development of digital services is an integral part of reforming the service structures of social and health care. Digital services are developed and designed based on qualities such as availability, flexibility, safety and accessibility. The quality and availability of services can be assessed by evaluating the user experiences of clients and experts, and the effectiveness of services in terms of people's wellbeing, health and everyday lives. The adoption of digital services in social and health care requires developing and mastering new practices. (Heiskanen, Hyvönen, Repo & Saastamoinen 2007, Hautamäki 2008).

Services are aimed at supporting the good quality of life, right of self-determination, and independent living of the elderly regardless of their functional abilities. The personal needs of the elderly provide the starting point. The home is a meaningful and important place for elderly people, and services such as home nursing and home help services are needed. (Krons, 2003.) In the quality recommendation on the care and services for the elderly, the goal is to ensure that as many elderly people as possible can live independently in their own homes and in familiar living environments. Every municipality should have an up-to-date ageing strategy which guarantees the social rights of elderly people, and a development programme to that end. The development programme should allocate sufficient resources for these activities, and services should be ethical, user-driven and based on recommendations regarding care and nursing practices. Progress towards these objectives is monitored with a follow-up system which includes quality indicators for each service. (Quality recommendation on services for the elderly 2008)

In the quality recommendation on the care and services for the elderly, the goal is to ensure that as many elderly people as possible can live independently in their own homes and in familiar living environments. The 2002 ageing policy of the City of Espoo has been updated for the 2009-2015 period (Kylmänen-Kurkela et al. 2009). One of the policies outlined in the programme concerns the use of technologies to support independent living. Welfare technologies are used to promote wellbeing and the prevention of illnesses. IT solutions facilitate the use of remote services, and further developments in welfare technologies mean that the focus can be shifted from institutional care towards non-institutional and home-based forms of care. The possibility of using technologies in home care should be considered.

Welfare technology refers to diverse technical solutions that can be used to maintain or improve people's quality of life, wellbeing or health. Welfare technology is intended to increase the flexibility and efficiency of welfare services. Technology has increased the equality of service users, improved

availability, reduced the work of service providers and produced cost savings. (cf. Jones, Skirton & McMullan 2009.) In Finnish social and health care, welfare technologies are defined as ICT solutions aimed at improving individuals' quality of life. Welfare technologies are used increasingly to provide help for the elderly. (Ahtiainen & Auranne, 2007, Tanskanen et al. 2009).

Welfare technologies can be used to improve the quality of services. They provide opportunities for developing new solutions that promote wellbeing. Welfare technologies have a human focus and they utilise new knowledge in interdisciplinary contexts for the diagnostics and prevention of illnesses and remote monitoring application. New technological solutions support areas such as home nursing services and self-care. (Hallipelto, 2008.)

As the welfare sector moves towards virtual services, ethical questions grow in significance and require systematic research (Topo 2008). Training and competence development must be provided flexibly to experts and staff. The digitisation of technological tools, methods and activities that support learning and increase competence requires competence-related research and development. The technology revolution opens doors to new business opportunities and creates the need for userdriven innovation (Lehenkari, Kautonen, Lemola & Viljamaa 2009).

3.2 Purpose and Methodology

The research purpose of the Safe Home project was to study, develop, produce and evaluate eWellbeing services with various client groups; to promote welfare, rehabilitation and support independent living at home. The project produced interactive programmes and selected eWellbeing services through CaringTV® or alternative technological solutions. The objective was to study, test and model the eWellbeing service concept and the related processes.

The cost-effectiveness of eWellbeing services was studied from the point of view of selected focus groups, services and technological solutions. The aim was to produce models for the processes and costs of selected eServices. In addition, the project evaluated new competences related to eWellbeing services and their provision.

The research initiative sought answers to the following questions:

1. What kind of eWellbeing service concept takes shape as a userdriven operating model?

- What expectations do the different client groups and experts have with regard to the content and implementation of eWellbeing services?
 - What methods are used to produce eWellbeing services?
2. What effects do the selected eWellbeing services have on the welfare of different client groups?
 - What kinds of user experiences do different client groups and experts have about the produced eWellbeing services?
 3. How are process descriptions modelled for the eWellbeing service?
 4. What kind of competence does the project produce?

Action research was chosen as the methodological approach for the project. The action research process implies that the subjects of research are active participants in the change and research process, that the research is practically oriented, and that the process is cyclical, alternating between planning, action and evaluation. Action research analyses the background of actions, reflects on and develops alternative solutions to problems in order to achieve the set objectives, and produces new knowledge and operating models (cf. Aaltoila & Syrjälä 1999, Kuula 2000, Heikkinen 2001). Action research is based on critical knowledge interests - the goal is to produce new knowledge and forms of operation (Kyrö 2004). The basic principles of action research are practicality, subject participation and the creation of new activities or interventions related to change. (Kuula 2000). The project actors include clients, relatives, social and health care experts, partners and students. Data was collected using a number of different methods which meant that new information and activities could be produced proactively in different stages of the project. The Safe Home project was based on an action research process, a user study and a case study. Action research anchored new development activities into real-life environments, such as a home or a service house, immediately during the process. Having different user groups as actors ensured that welfare technologies were viable and that contents were suitable for the expectations and personal circumstances of the users. In the case study, the strengths and weaknesses of welfare technologies were identified by individuals and groups - even organisations - in different contexts. The case study provided opportunities for piloting new practices and finding potential solutions. The purpose, process, time perspective and actors' roles in the action research process, case study and user study are described in the following table. (Table 1).

Table 1. Characteristics of action research, case study and user study (Heikkinen 2001, Saarela - Kinnunen & Eskola 2001, Yin 1994)

	Action Research	Case Study	User Study
Purpose	Change Empowerment	Understanding and reconstruction	Sharing knowledge, skills, competences and experiences
Process	Dialogue and critical reflection Active participation	Retrospective description	Testing, piloting, and creation of new solutions Producing tacit knowledge, ideas and solutions
Time perspective	Current	Past - current	Current - future
Actors' roles	Individuals as partners in interaction	Individual Group Situational Organisation as the subject of the case study	Researcher Inventor Innovator

Action research together with Laurea's Learning by Developing model enhanced the compatibility and practicality of research and development activities. The Safe Home project is based on the innovation process and a userdriven approach. Action research and the LbD model have been used in previous CaringTV RD&I projects (cf. Lehto 2008). Action research in the Safe Home project was carried out in a cyclical process (Figure 1.)

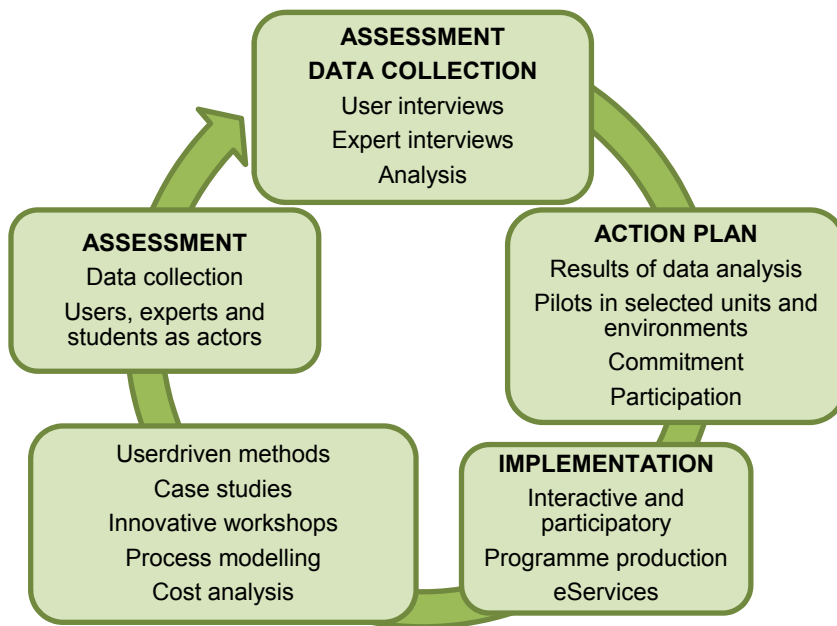


Figure 1. Action research cycle

The LivingLab approach was utilised in the project (cf. Luotonen, Marttila, Hyyppä et al. 2011) alongside userdriven methods, which meant that different actors were actively involved in the development process of CaringTV. New knowledge and activities were produced in a cyclical process in real-life situations and genuine environments. The activities were studied, reflected upon and developed together with the participants to produce alternative solutions based on the project objectives. (cf. Kuula 2000, Heikkinen 2001, Raji & Lehto 2008). During the development process, clients and experts produced ideas together for new interactive programmes and virtual eServices. Different users and groups tested the new contents and methods and provided feedback. Virtual eServices were implemented by using different technological solutions and methods. (cf. Lehto 2008.)

Real-life operating environments and LivingLabs included the home environments and service houses of elderly people and other special groups, day centres, and the operating environments of service providers such as libraries and parishes. The LivingLab approach meant that participants from different environments took part and used the new technologies to produce programmes and develop digital services. Latest IT solutions and mobile equipment were used and applied as early as possible. Some participants were able to use equipment such as laptops independently or with assistance and

take part in interactive programmes. The majority of participants needed technological solutions such as larger monitors or touch screens due to restricted abilities. Active participation by experts also required the use of new IT equipment to ensure that objectives were achieved. The programmes produced during the project included coordinated sessions, interactive discussion and culture-related programmes, and new digital wellbeing services.

The objective was to produce new virtual services in the context of CaringTV to promote interaction and participation. The development of virtual digital welfare services with different operators and in different operating environments using alternative technological solutions requires innovative service solutions, planning and testing. Cooperation with different operators strengthens the role of participants and anchors the activities in real life.

3.3 Research Participants

The participants of the Ehyenä subproject of Safe Home included clients (N=136) and experts (N=77). Of the elderly participants (N=85), seven lived at home and 78 lived in service houses or used their day centres.

The average age of those living in their own homes was 78.5 years. The age range was 61-89. Three of those living in their own homes were women, and the remaining four were men. The average age in service houses was 79.5, and the age range was 60-94. There were 38 women and 40 men. In addition, the focus group included 16 Swedish-speaking elderly people who participated in group activities organised at the day centres of service houses. (Figure 1.)

The number of participants with developmental disabilities was 12. Their average age was 42.3 years. Nine participants were women and three were men. The majority lived in assisted facilities in their own rooms in residential centres or units. Nearly all of the disabled participants had day jobs outside the homes.

Other participants were persons with mental health problems (N=4), and families with small children (N=4) and young people (N=28) who were clients of child welfare services. The mental health patients were three men and one female who actively took part in the programmes provided via CaringTV. Their average age was 32.8 years. All had suffered from mental health problems for several years and had problems coping independently. The participants lived in their own homes or in assisted flats. They used the group services and other services provided by the coordinating unit almost weekly. In the final stage of the project,

the mental health rehabilitation patients participated in the programmes every third week.

The families with small children participated in the project once a week at a group facility. The average age of the parents was 27.3 years. The total number of children was seven. Their average age was 2.1 years. The children's ages ranged between 11 months and 5 years. The families needed support in the general care of the children and in coping with everyday responsibilities. The young people who took part in the project (N=28) lived at home, independently or in family units. The average age of those living in family units was 15.6 years, and the average age of the remaining young participants was 18.4 years. There were six boys and 22 girls. Some of the young people participated in CaringTV programmes as a group, and some took part one-to-one conversations with an expert via mobile connection (laptop).

The experts (N=77) representing the operating environments of the participants also contributed data to the research. The experts represented the different services accessed by the client participants, such as social and health care units, service houses and residential units. The average age of experts representing the services for the elderly (N=27) was 49.7 years. All but one of these experts were women. Only one had a higher university degree; five had a bachelor's level degree or a vocational qualification (Bachelor of Health Care). The majority of the experts had completed vocational education (enrolled nurse). 20 had over 10 years of work experience.

22 of the child welfare experts (N=27) were women and five were men. Their average age was 43.8 years. Over half of them had a higher university degree (professional title of social worker) and others had lower degrees (e.g. social instructor) or a vocational qualification (coordinator). Over half of the experts had over 10 years of work experience.

The age of experts working with the disabled ranged between 24 and 56 years. Nearly all were women and nurses, physiotherapists or enrolled nurses. Background of the experts were Bachelor of Health Care or Bachelor of Social Services or Master of Health Care. Four had less than 10 years of work experience. The educational background of experts working with mental health rehabilitation clients was either a bachelor's level degree or a vocational qualification in social and health care. Only one had less than 10 years of work experience.

The participants of the Omana subproject were specifically elderly clients of home care services who lived independently, family caregivers, and service

house clients with long-term illnesses or rehabilitation needs. A total of 91 people took part in the pilot and action research project for the virtual guidance and counselling service concept. Of the elderly participants, 62 were users of CaringTV; 5 of these were home care clients, 11 were elderly family caregivers, 29 were elderly service house clients, and 17 were elderly people from the peer group (Aurala study group representatives (N=7) and representatives of the Aurala Seniorituki KOTOSSET technology group (N=17). In addition, 8 elderly users of telecare systems took part in the Omana subproject. These individuals lived in their own homes. Other participants included 21 relatives and family members; 9 of these participated in the CaringTV pilot and 12 participated in the telecare pilot, and both groups were actively involved in the development activities. A total of 28 experts participated in the Omana subproject. These included representatives of municipalities, home care and service house supervisors or workers, and other experts.



Figure 1. Participants of CaringTV

3.4 Userdriven Methods and Data Collection

In a user study, the emphasis is on systematic collection and refining of personal experiences, and the user's participation in the product development process (Hyysalo 2006). User data refers to information about the characteristics, features, forms and aesthetic qualities of a product or service as perceived by an individual or a group. The situation, relationship with other people or objects, and earlier experiences can provide user data for research purposes. In addition, user data can be collected by examining the experiences, visions and assumptions of designers, although collaboration with users is increasingly common.

User studies are usually based on qualitative research methods. In addition to conventional methods such as one-to-one interviews, focus groups, observation and participant observation, data can be collected using methods such as stories, thinking aloud, video recordings, images and drawings. In user study, observation refers to monitoring the user in his or her own environment to collect information about the user, his or her activities and user environment, and details about the product's use. The data is analysed, utilised and visualised using models and prototypes. Existing published information about the topic is also collected. (Ovaska, Aula & Majaranta 2005, Hyysalo 2006.)

Hyysalo's (2006) method for examining the user experience and its different aspects was used as a reference framework in the Safe Home project. The user experiences of different client groups and experts were examined in different stages of the project using the world schemes proposed by Hyysalo. The client groups represented the "people's world", where user experiences are examined with regard to issues such as the suitability of different technologies in improving safety. The "activity world" was used to examine the role of interaction in the use of the technological platform. Safety circuit solutions represented the "product world". The development of CaringTV and the related eServices was partly representative of the "physical world" proposed by Hyysalo: bringing services to environments such as homes requires special solutions. The user study also included a case study which provided a means for testing and producing interactive programmes and eWellbeing services for different groups in real environments. In the Safe Home project, data was collected in different stages of the action research process by a number of different methods. (Figure 2).

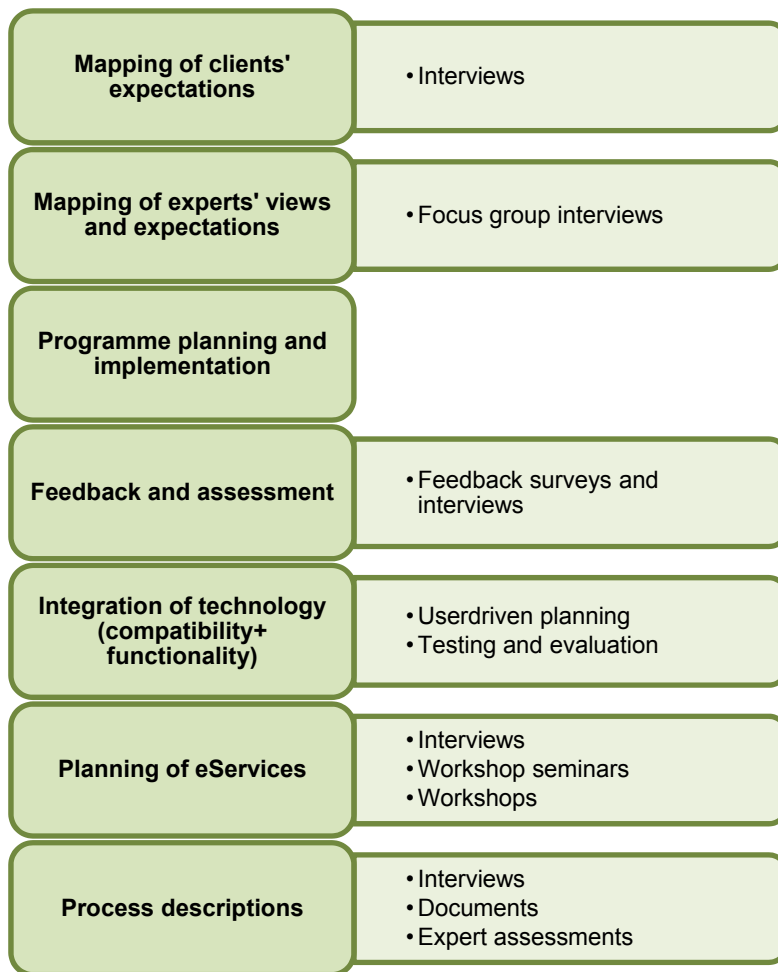


Figure 2. Data collection and methods

In the first stage of data collection, the participants were interviewed in order to map their expectations and to develop contents for CaringTV programmes. As project actors, the participants were also involved in workshops which produced ideas for new virtual services. Active participation produced a plethora of new ideas for services. The active role and participation of the actors is typical of action research. (cf. Kuula 2000).

Information about the problems, expectations and challenges of different actors was collected along with a description of the current state. The innovation process continued in workshops to develop new solutions, ideas and digital virtual services. In order to ensure the progress of the development process and attainment of its objectives, it is important to identify and evaluate genuine,

userdriven experiences when developing new services and operating models. In action research, the innovation or change happens and takes shape during the research project (cf. Kyrö 2004). Learning takes place between participants through the reflection and sharing of experiences, which means that the change is genuine. Research material was analysed by inductive qualitative content analysis and using Glaser's (1978) Six C's model. (Cf. Lehto 2008.)

3.5 Programme Themes and eWellbeing Services

In this study, the participants were simultaneously the users and developers of services. Data was collected and evaluated by a number of different methods throughout the project. Analyses during different stages of data collection provided new contents for interactive programming, new virtual eWellbeing services, and new working methods for different client group. Using continuous evaluation, the interactive programmes and eServices were tested and developed in cooperation with different actors. The participants were engaged, empowered and activated through genuine partnership. (Cf. Lehto 2008.) Figure 3 contains an example of programme themes designed for the elderly.

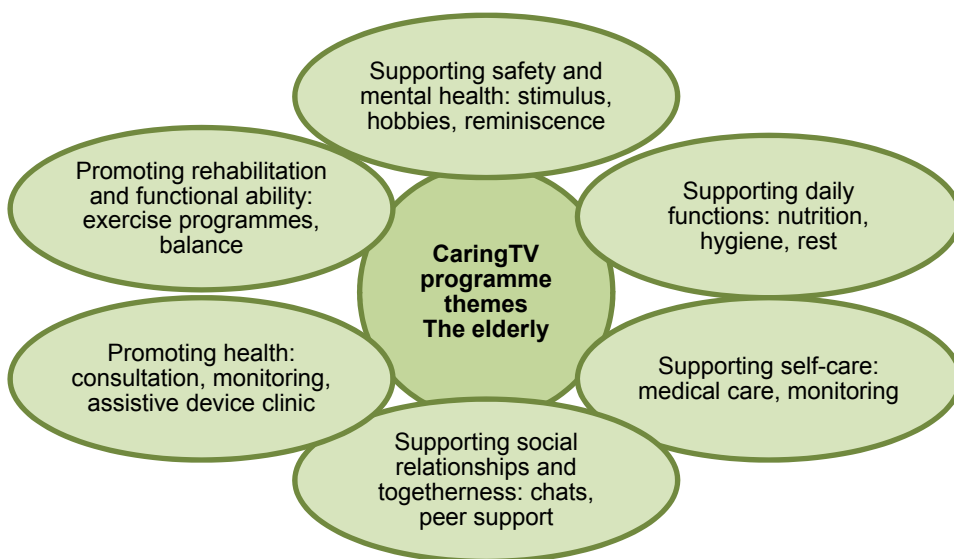


Figure 3. Interactive programme themes

As the amount of information increases, so does the significance of technology; new applications and utilisation models are needed for both private and public

sector clients. The need for welfare services grows in line with aging. Particularly virtual guidance and counselling services based on clients' expectations and needs are constantly developing and growing. Today's clients are increasingly skilled and demanding in using virtual services. More and more clients have access to the Internet and other multimedia solutions and opportunities. (Armanto 2005).

A number of different userdriven data collection methods were used in the Safe Home project, including workshops and co-ideation in conjunction with seminars. Interview data and workshop results were used to formulate ideas for new eWellBeing services (Figure 4).



Figure 4. Virtual eWellBeing services

The development objective of the Safe Home project was to produce interactive and virtual eWellbeing services based on new knowledge of information technologies. The availability of virtual services promotes preventive and self-directed health care. If new client-oriented operating models and alternative services are to be produced virtually and in diverse service environments, they must be compatible. The purpose of new operating models is to activate users and bring together various services (cf. Rajala, Pirnes & Hiroo 2007). Userdriven models create a basis for innovation and business operations that form a part of the great shift from service system orientation to client orientation. Technical

solutions are increasingly moving to clients' operating environments, be it in the home or the workplace (e.g. Aro, Harjo Kainulainen, etc. 2008). Technological solutions were utilised with a userdriven approach in the development and testing of welfare and health-related eWellbeing services. Table 2 below summarises the eServices produced and piloted as part of the project, their objectives, contents and client groups.

Table 2. Contents of eWellbeing services

<i>eWellBeing service</i>	Objective	Contents	Target group
eNurse	To support wellbeing, health and coping at home	General health Social relationships Daily activities Feelings and concerns Remote health data	Elderly living in their own homes
eDoctor	To support health and provide information about illnesses and possible symptoms	Medical guidance Discussions about health and symptoms	Elderly living in their own homes Experts
ePhysio-therapist	To support and encourage clients to maintain and improve their functional abilities	Tailored plans	Elderly living in their own homes The disabled Mental health patients
eDeacon	To offer discussion and support for the client's personal issues and feelings	Discussions about personal matters	Elderly living in their own homes Elderly living in service houses
eLibrary	To support and promote reading and music as hobbies	Literature sessions Music and singing sessions	The elderly Young people

3.6 CaringTV Conceptual Model

The starting points for CaringTV in the Safe Home project include the following concepts: participation, interaction and empowerment. The concepts took shape as the result of inductive analyses of collected data. Data was collected and analysed during different cycles of the action research process during the project. Userdriven methods provided new knowledge which was utilised in the implementation and testing of programmes and eWellbeing services. (Figure 5).

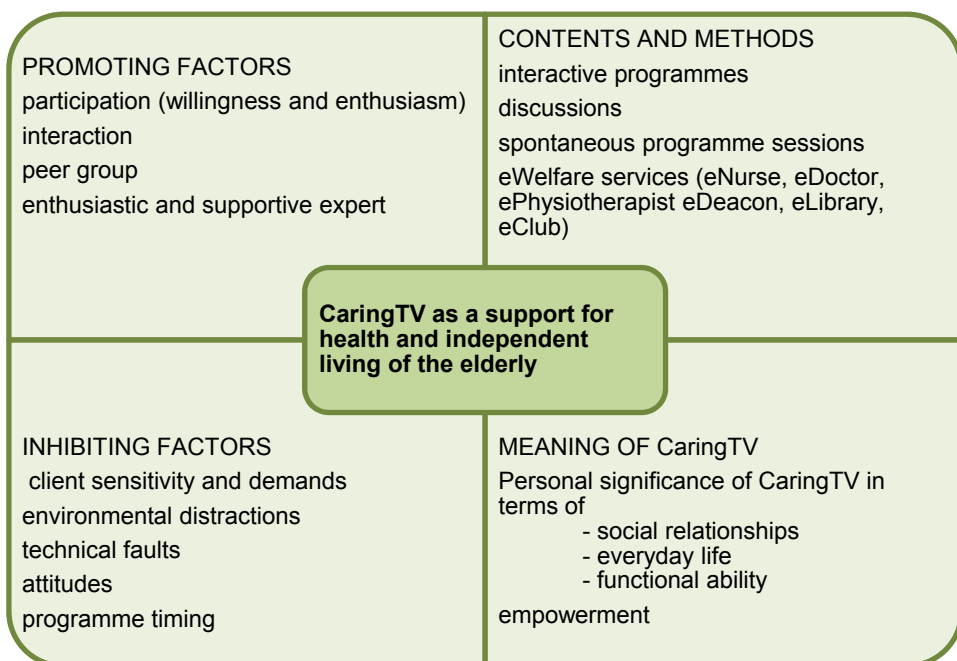


Figure 5. Conceptual model: CaringTV with and for elderly.

In the action research process and userdriven methods, the focus was on the participation of different actors. Participation as a concept can be examined from the point of view of promoting and inhibiting factors. Factors that promote participation are motivation and the willingness to participate, support and encouragement from another individual or group, and an inspiring environment. The contents and topicality of programmes can also promote participation. Since the focus groups of the Safe Home project are particularly sensitive and demanding, the main factors that inhibited participation were poor health, poor

functional ability, and forgetfulness. In the case of the experts, unwillingness to participate in the project, attitudes, and lack of know-how were identified as inhibiting factors. Other factors that inhibited participation in CaringTV included technical problems, such as faults or breaks in sound, and problems related to the physical environment, such as noise.

Active and regular participation in CaringTV programmes in the Safe Home project supports the functional ability and everyday coping of the individual or group, and provides meaningful activity in their everyday lives. For example, for elderly people living in their own homes, the programmes provided more variety in daily routines as well as peer support. For disabled people, participation in CaringTV programmes even replaced one weekly activity session, which meant that the staff could give more attention to residents with special needs. In the operating environment of young people, CaringTV provided a new form of group activity. According to feedback, CaringTV did not prevent or inhibit the functional ability or everyday activities of any person or group in any of the focus groups. According to previous studies, the use of technology may help to activate individuals or groups. The use of technology saves time in client work and administration. Technology is also important in the deployment of new methods. Technology promotes opportunities for clients to participate in the development of wellbeing services.

Participation appears as a multi-dimensional concept in the research material. The concept of participation can be examined from the point of view of activity. Participation can be passive or active. In passive participation, the participants of CaringTV programmes are assisted and guided by other operators such as experts. In this case, a programme coordinator or a member of staff actively coordinates the programme for the individual or group. A typical example of passive participation is a programme that focuses on informative content or given instructions. Active participation refers to active, interactive or spontaneous participation of an individual or group in CaringTV programmes. Examples of active participatory programmes are activity-based programmes or programmes prepared and coordinated by the participants themselves. (Figure 3.)



Figure 3. Activity in the programme

In activities involving active participation, interaction is richer, more active and interactive than in passive participation. Interaction is another key concept of CaringTV. In terms of content, interaction occurs in the form of reminiscence, examination of the present, situational sensitivity, or a future orientation. In the context of the past, interaction occurs in the form of reminiscence in a group or as individuals, recounting of personal experiences, and sharing of information. In the present dimension, interaction refers to the recognition of information or situation, concentration, or sharing about the programme theme or pre-agreed content. An example of a programme focussing on the present is one that relates to a current news story or event.

Situational or momentary interaction is about active dialogue and deep sharing of issues or situations. Situational sensitivity supports spontaneous discussion about the topic and it requires continuity. One example of situationally sensitive interaction is the "Saturday coffee session" organised by elderly people living independently. In these sessions, the participants take part in a userdriven, voluntary activity, discussing and sharing thoughts and experiences about a spontaneous topic. Situational sensitivity is also evident in how the participants continue discussion amongst them after the programme ends. Future orientation in interaction shows in the content of discussions and reflections related to the expectations, hopes and anticipations of the participants. In the evaluation data of virtual eWellbeing services, the future dimension occurs in areas such as hopes expressed about a new eHealth centre or about userdriven, tailored services. (Figure 6).

The analysis of the content and scope of interaction as a concept in the context of interactive CaringTV can be described as follows:

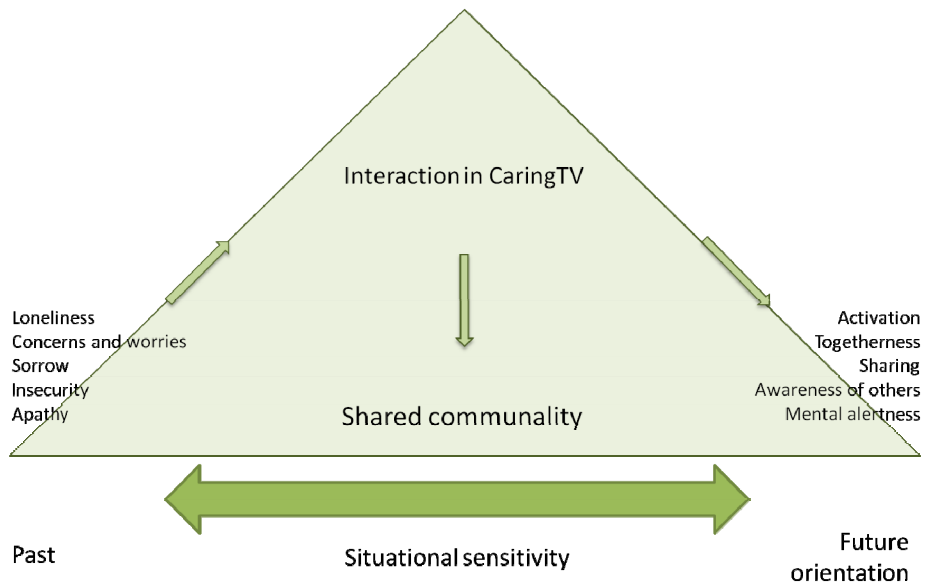


Figure 6. Interaction in CaringTV (example: the elderly)

The userdriven approach and programme contents were selected based on interview data from interviews with both clients and experts. From the client's point of view, the evaluation of interaction concerns activation, sense of belonging, care and relaxation. Interaction means different things to different client groups. For lone elders living at home, interaction through CaringTV has provided everyday content that supports their functional abilities and independent living. CaringTV has provided a community for the elderly, and it has become a part of their everyday lives.

"How happy we are, we get a chance to support each other"

"We are like one big family"

Interaction has promoted the activation and sociability of individuals in different focus groups and improved their sense of belonging and concentration in different operating environments. Familiarity and continuity are prerequisites for interaction. The enthusiasm and commitment of the expert promoted and strengthened active participation by individuals living in different types of operating environments, such as disabled people, and the intelligibility of interaction. The presumptions about the demands and difficulty of interaction via

CaringTV between disabled people were proven wrong. Authenticity and focus of interaction, and the clarity of communication supported the clients' participation.

The concept of empowerment was derived from the analysis of the concepts of participation and interaction. Empowerment as a concept indicates trust, encountering, presence, and opportunity. With regard to content, empowerment can be described both in terms of encountering the individual and communal participation. Individuality refers to the consideration of the participants' expectations and focus in the planning and implementation of programmes. Trust strengthens the participants' active roles both in programme production and in the implementation of eWellbeing services. One-to-one discussions with the eNurse or eDoctor support, promote and strengthen the general situation of an elderly person. Having the courage to participate in the programme or in the ensuing discussion indicates empowerment. At its best, empowerment is about genuine presence and sense of belonging. Empowerment includes the dimension of possibility, which means that the participant himself/herself wants to become active in a new way. In the context of CaringTV, empowerment manifests in the participants' desire and courage to take responsibility for programme production. An example of possibility in empowerment is a shy and timid young person who has the courage and confidence to design and implement an activity programme for other young people on CaringTV. CaringTV can support a person's self-esteem and self-confidence. The expert's encouragement and role are significant in the empowerment process.

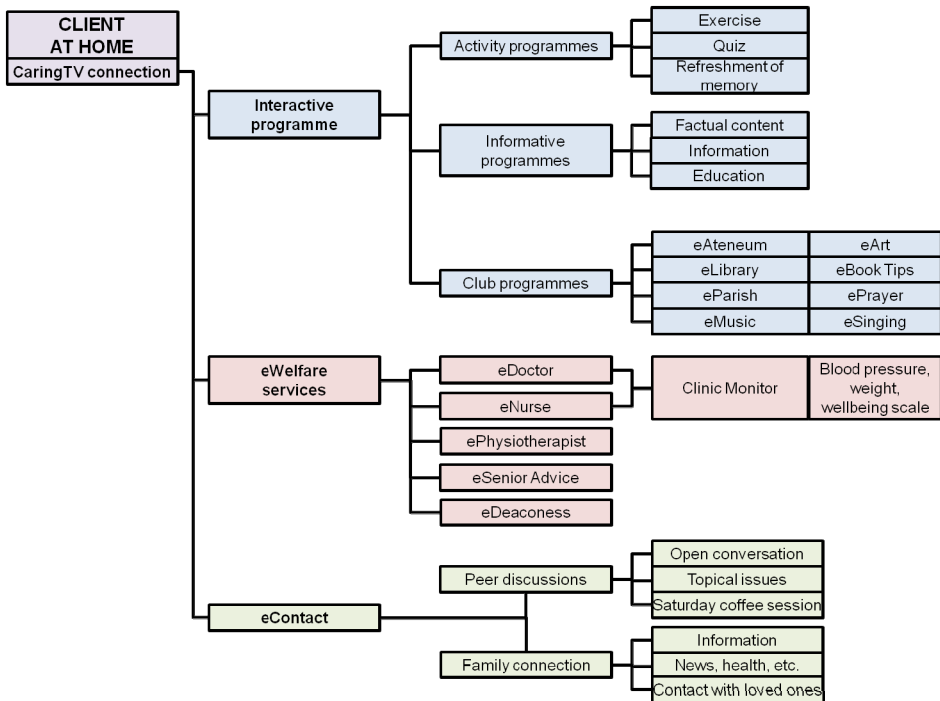


Figure 7. CaringTV roadmap

Figure 7 describes the services related to the CaringTV concept (road map). CaringTV programming includes interactive programmes, eWellbeing services, and eCommunications. Interactive programming comprises activity programmes, informative programmes, and club programmes. eServices formed a separate group which included the eDoctor, eNurse, ePhysiotherapist, eSenior Counselling, and the eDeaconess/eDeacon services. eCommunications consisted of peer chats and contact with relatives. The services produced as part of the research activity in the Safe Home project have been piloted and evaluated. The road map facilitates the provision of customised and focused solutions for virtual and digital services to a number of different user groups.

The following recommendations can be drawn from the research data. (Figure 8).



Figure 8. Userdriven recommendations: interactive programming and virtual services

4 CaringTV® as an Everyday Support of Different User Groups

In the Safe Home project, both the clients and the experts had an important role in the development of the project. The results of their participation, evaluations and joint workshops have been used to carry the project through with a userdriven approach. Even minimal participation by users can result in better functionality and usability of services. Furthermore, user experiences and feedback can provide improvement ideas with regard to the usefulness and appeal of products, and new product ideas for businesses. (Heiskanen et al. 2007.)

Further development of alternative technological solutions is needed in order to fulfil different user groups' expectations about the availability of virtual services. One aspect of the userdriven approach is the desirability of the technology. If the users find the products and services appealing, they can be used in a more productive way. The clients and all parties should have a clear idea about what need is being fulfilled with the technology. This is a step towards understanding the bigger picture: technology is a good servant but bad master. The effectiveness of technologies and the related services is an important development area from the point of view of the society as a whole. Good planning pays dividends in the future. (Raappana & Melkas 2009.)

Clients' participation in the project and focus groups are described in the following chapters along with the results of action research.

4.1 Interactive Programmes for the Everyday Lives of the Elderly

Paula Lehto, Johanna Leskelä, Hanna Kantell & Katja Tikkanen

As early as the 1990s, research showed that the challenges of elderly and geriatric care will be a central area where development is needed by private and public social service and health providers. Senior citizens' desire to live at home

is growing significantly. A period of extensive institutional construction came to an end in the 1990s. Long-term living at home postpones the use of elderly services until a very late age, so the importance of friends and relatives in providing support for living at home increases. Some estimates indicate that more than 80% of daily services needed by senior citizens already come from outside the public sector. Another challenge relates to social, economic and cultural changes in aging. In the future, the elderly population will be more financially independent and more highly educated, being able to make independent decisions on their lives until a late age. They will have more economical and political power in society. Their consumption habits will also change. Improvements in the health and coping ability of the elderly population are already visible; in future there will be more and more healthy, capable senior citizens. (Holma 2003.)

Koskinen (2004) identifies the third, fourth and fifth ages as stages of life. In the third age, life continues actively. The fourth age involves gradual renunciation and dependency, which means an increased need for care and support. In the fifth age, we are more dependent on other people's assistance. Koskinen (2004) links the new concept of "productive aging" to the third age. In productive aging, retirement after a long career can be seen from the point of view of unused, valuable resources and tacit knowledge. The third age and productive aging recognise the opportunities for the elderly of actively participating in and benefiting society.

The concept of productive aging also questions traditional aging-related age structures, norms, stereotypes and expectations. (Koskinen 2004.) The third and fourth ages are challenges for positive aging, and particularly for the active participation of the elderly in the research and development of new aging-related welfare services. The personal experiences and understanding of senior citizens in relation to health and wellbeing are particularly significant. Even if functional ability should be reduced or limited, activeness and humanity can continue through participation and the smooth functioning of daily activities. Each senior citizen is different, with unique health, capabilities, life experiences, social resources and financial circumstances. Some are completely independent and can cope alone at home. According to Heikkinen (2003), aging can be described using diverse characteristics: aging is universal and chronologically progressive; it weakens bodily functions and increases the likelihood of death. Some definitions see aging mainly as a property of a biological system, all multi-celled organisms being subject to the same laws of nature. In other definitions, aging is seen as a broader phenomenon, involving changes in bodily structures as well

as in physical, psychological and social abilities. Even by the broader definition, aging increases the risk of illness and reduces the quality of life (Heikkinen 2003.)

The main element in the lives and ability to cope at home of the elderly is functional ability. According to Jyrkämä and Sankari (2007), functional ability can be described in terms of activity, containing the dimensions of capability, skills, desire, compulsion, ability and emotion. Functional ability can be maintained if real-time everyday rehabilitation is provided taking into account the person's overall situation. Reduced functional ability and poor mobility with all their consequences are significant health-deteriorating elements in the lives of the elderly. Rehabilitation can help in solving problems related to the functional ability of senior citizens.

Description of elderly clients

Elderly people (N=85) were the largest group of CaringTV participants and users in the Ehyenä subproject. Their average age was 79 years. Elderly clients included those living in their own homes or service houses, and groups which met in service houses or day centres, including daytime activity groups. Relatives and experts were also involved as actors in the project.

Seven private clients took part in the project. One of these was a couple. Those living in their own homes lived alone and had various health problems. They had poor access to services and poor mobility. They felt a need for different types of information, stimulus and guidance. They had the will to participate and share their knowledge, and they felt a need to belong to a group. Some clients had home care, some lived completely independently. Some of the clients needed outside help daily or weekly. Nearly all of those living at home rated their health good or fairly good. Some had reduced functional abilities, especially with regard to mobility. All clients had the CaringTV touch screen which they used to participate both in programme production and in eWellbeing services. Medixine's remote monitoring devices - weight scales and a blood pressure monitor - were connected to CaringTV for three clients. One client had Everon's Vega safety bracelet. One of those living at home had active eContact with a child's family who lived in another part of Finland. A mobile device was installed on the relative's computer.

The services were created based on the personal needs of the clients. This included the possibility to take part in interactive CaringTV programmes and selected eServices and the opportunity to monitor personal health with remote monitors. The eServices included 24/7 eHealth Advice, eNurse, eDoctor,

ePhysiotherapist and eDeacon, as well as eLibrary, ePharmacy, eArt Exhibitions, and eSenior Counselling. In addition, the clients had the possibility to have direct contact with each other via CaringTV and to continue discussions on the programme/club channel after programmes or services. One client had a connection to a relative's computer via the "family contacts" feature on CaringTV.

The majority of participants lived in service houses or used their day centre services. CaringTV Broadcasting Centres were installed in four service houses/day centres in Espoo. The elderly were able to take part in participatory programmes and eServices as groups. Participating groups included daytime activity groups and their coordinators, residents and carers in caring homes, and senior citizens' groups and volunteers in day centres.

Nearly all residents of residential homes needed round-the-clock monitoring and care. They had an impaired functional ability in one or two areas and significant deterioration of sensory and cognitive functions. In addition, the residents suffered from problems with memory, home sickness, and had difficulty leaving the home. They had needs related to exercise, stimulus and guidance, and feelings of loneliness. The majority of residents needed daily assistance and care. At one service house, CaringTV touch screen units were trialled in eight apartments and a mobile version (downloadable to the workstation) was trialled in the nurses' office. Residents could take part in interactive CaringTV programmes from their own apartments and have video contact with the nurses. The nurses could also open a video connection with residents and relatives, two of which had a CaringTV connection at home. The purpose was to give residents reminders about events scheduled for that day, medication, etc. The family connection technology was tested in two apartments. Residents took part in programmes and eServices in small groups during the project. One resident accessed the eDeaconess service via the Broadcasting Centre.

Elderly people living at home who use day centre services vary greatly in terms of their health. Some have a significantly reduced functional ability, and they need the help of relatives or home care in order to be able to live at home. Some have no significant reduction in their functional ability, and they lead active lives and wish to help other elderly people. Loneliness is a problem shared by many lone elderly people living in their own homes, which is why the company of others and group activity is perceived positively. Meeting other people outside one's own home is considered important. The clients of daytime activity groups live in their own homes with the help of either home care services or family caregivers. The group members have reduced functional ability in one or two

areas. Some of the daytime activity participants are in reasonable health and live independently. Others suffer from poor memory and declining health. The latter often have vision and/or hearing problems. These individuals use the daytime activities once a week during a rehabilitation period. Some day clients took part in CaringTV programmes as a group. Some of the users of service house/day centre facilities also took part in CaringTV programmes once a week. These individuals participated in CaringTV programmes as a group in a communal room of the facility. In eClub activity, participants included two groups from two different facilities. In addition, Swedish-speaking individuals (N=16) from two different facilities took part in CaringTV club activities once a month.

Two day centre users also tested CaringTV units in their own homes. One had a CaringTV unit with a touch screen, Medixine remote monitoring devices and a Vega safety bracelet by Everon. The other client had the mobile version of CaringTV downloaded onto a personal computer. Both clients were able to participate in interactive CaringTV programmes and customised eServices.

The relatives of the elderly lived far away or were not able to meet often. They wanted to be involved in the elderly person's care and discuss his or her situation with a nurse. They also wanted to have active contact and involvement in the person's care. Three relatives had the family contact feature of CaringTV. The connection was downloaded onto their personal home computers. The family contact could also be downloaded onto laptops for use outside the home. The family connections were used actively. For example, grandchildren living far away were able to have video contact with their grandparents. In addition, relatives were able to use the family connection to contact the nurses at the living facility about practical matters and to discuss various issues.

The expert participants (N=27) of the project included nurses and other staff working with elderly people in assisted living facilities and day centres. Three workers in each service house were assigned as liaisons to distribute information and coordinate the activities at the workplaces. All experts were actively involved in the development work. In addition, the liaisons provided technical support to other staff and clients. The experts were able to take part in participatory interactive programmes via the CaringTV Broadcasting Centre together with residents and clients of day groups. In addition, they were themselves involved in producing participatory CaringTV programmes with clients during the project. One nurse coordinated a Swedish-language group for Swedish-speaking clients once a month. The nurses were able to participate in different training events, occupational wellbeing groups, and staff information

programmes via CaringTV. Different types of remote meetings and consultations were also available during the project.

The interactive CaringTV programming was aimed at producing interactive programmes broadcast to clients' homes and participating group. The objective was to support independent living and wellbeing of elderly participants. Another aspect was the production of new competence for UAS students. For the elderly client group, the programmes were implemented between the two subprojects Omana and Ehyenä. There were at least ten broadcastings per week (with the exception of bank holidays). Half of them were coordinated by Turku UAS and the other half by Laurea UAS. Programming was developed together with clients, professionals and the two universities to meet the needs of the elderly client group.

The participatory programme content of CaringTV consisted of activity sessions coordinated by social and health care students, interactive discussion programmes, and meetings with experts. Programme contents were based on themes which emerged from initial interviews with the clients. These are presented in Table 3 below.

Table 3. Programme themes for the elderly

Theme	Example of content	No. of progs Ehyenä	No. of progs Omana	Total
Recreational and entertainment	Ateneum art programmes, music and singing, poetry panel	76	124	200
Promotion daily activities and everyday coping	Nutrition programmes produced by hospitality students and nutritional therapists, tips about sleep, hygiene, first aid, etc. provided by health care students	92	104	196
Programmes to promote functional ability and exercise	Chairobics sessions, balance exercises and relaxation sessions coordinated by physiotherapy students	198	47	245
Programmes to promote togetherness and participation	Discussions, competitions, the "Armchair travellers" series produced by social science students, "Early morning thoughts" sessions	198	177	375
Monitoring and reminders related to self-care				
Programmes to promote health and wellbeing	Weight management clinic (Turku UAS), diabetes clinic, programme series about cholesterol, etc.	62	40	102
Total		626	492	1118

In the period from 1 January 2009 to 31 May 2011, a total of 1,118 programmes for the elderly were broadcast, and the total number of participants was 11,569. The average number of clients per programme was 10.34. Some programmes

were produced as longer series which included five to ten programmes on the same theme. Some examples of these were the weight management clinic coordinated by health care students, chairrobics sessions provided by physiotherapy students, the "Armchair travellers" series produced by social science students, and various programmes about health and wellbeing.

The expert meetings of CaringTV were produced by the Ateneum Art Museum, the Finnish Federation of the Visually Impaired, and the Oodi cafe for senior citizens. Ateneum (the National Gallery of Finland) promoted the knowledge of fine arts and cultural heritage among the elderly via CaringTV. The museum's curators, including the educational curator, produced programmes about the works of famous artists. Pictures from different collections were shown to clients on the CaringTV screens. The participants discussed the background and contents of the exhibition. The experts told interesting facts about the artists and their work. The clients felt that the arts programmes provided by Ateneum were meaningful and rewarding cultural sessions:

"These have been so good. I have never been to the Ateneum Art Museum, and now I can enjoy fine paintings here at home from my own sofa."

The decision-makers from the partner cities' services for the elderly visited the programmes to discuss plans related to aging policies, and the current state of services for the elderly. CaringTV participants were visited by Finnish president Tarja Halonen who greeted the clients virtually on the Finland Day of the Shanghai World Expo. The meetings were memorable moments to the elderly.

The interactive CaringTV programming can be examined from the point of view of social support. Social support is one form of intercommunication and a characteristic of a social network which has been found to have many positive effects on people's wellbeing, quality of life and ability to overcome difficulties (Gothoni 1990, Hokkanen & Astikainen 2001, Kumpusalo 1991).

Kumpusalo (1991) defines social support as interaction in which people give and receive spiritual, emotional, functional, informational and material support. According to Nutbeam in Kumpusalo (1991) social support includes emotional, informational and material support and services. A common feature of both definitions is the interactive nature of social support which does not exclude the possibility of direct support from one person to another or indirect support provided through a system. Interactive support is aimed at responding to the needs of each individual or group (Vilen, Leppämäki & Ekström 2002). If support is specified by content, the forms of support in the context of the programmes of

the Safe Home project are emotional support, spiritual support, informative support, and functional support.

In the context of Safe Home programmes designed for the elderly, emotional support refers to support such as encouraging feedback received and provided by the clients, listening, recognition and communality. Spiritual support was provided by the pastors and deaconesses of St. Henry's and Tapiola parishes. The contents of spiritual sessions included events of the religious calendar, discussions, Bible reading, prayers and singing familiar hymns. In addition, the deaconesses of the Tapiola Parish offered support in the form of personal discussion via the CaringTV "point to point" connection to the elderly clients in the Ehyenä subproject.

Informative support in the programming for the elderly included information and instructions related to health promotion and home treatment of illnesses, everyday information, information about services, benefits and different events, and advice about legal matters and other similar issues. Informative support was provided by representatives of different fields, including professionals, students, project workers and the participants themselves. In this context, functional support includes chairobics sessions, chair dance workouts, quizzes and various game programmes.

In the following table, the forms of social support and the direct/indirect source and programmes are identified through examples. Indirect support refers to support provided by experts, students or project workers, and indirect support refers to support provided by elderly participants to one another. (Table 4).

Table 4. Examples of forms of social support and the sources in the programmes of the Safe Home project

Form of support	Indirect source of support	Direct source of support	Programme example
Emotional support	Students, experts, project workers	Peer support between participants	Discussion & reminiscence programmes, Saturday coffee meetings
Spiritual support	Pastor, deaconess	Sharing of experiences	Spiritual sessions and discussions
Informative support	Students, experts, project workers	Sharing of common or expert knowledge within peer groups	Various health clinics, nutritional advice, safety at home
Functional support	Students, service house staff, dance instructor	Sharing of experiences	Chairobics, word games, quizzes, chair dance workouts.

Case - Aamun ajatuksia ("Early Morning Thoughts")

The development of a new kind of eService for the elderly began in spring 2010. It was based on the needs and wishes of home-based clients of CaringTV and the Aamukorva ("Morning Ear") telephone service developed by HelsinkiMissio which offers listening support to senior citizens in the Helsinki metropolitan area in the lonely hours of early morning (HelsinkiMissio 2010). The purpose of developing the Aamun ajatuksia eService was to produce and evaluate a new kind of service to the elderly clients of the Safe Home project via the interactive CaringTV. The aim was to establish the concept as a morning routine to begin the week with. The programme was developed as part of Laurea's eService Education Course as a development task.

In the practical implementation, the focus was on discussing the events of the past weekend, Monday morning feelings, and the name days and events of the coming week. Participants also discussed the Thought For the Week. Each session opened with morning music in the background and pictures related to the season and time of day displayed on the screen. The Aamun ajatuksia eService was broadcast on every Monday (excluding bank holidays) starting from autumn 2010.

According to the results, social support consisted of emotional and informative support. Emotional support comprised communality, reciprocity and peer support. Some interviewees referred to the group as "family" which describes its meaning very well. It is natural that emotional support was prevalent in a group who participants felt closeness to one another. The presence of emotional

support and the strong, positive sense of communality amongst the participants promoted the social wellbeing of interviewees.

"We are all one family."

"We discuss many things. It is wonderful; it is one of the most important [things]."

In addition to emotional support, the data demonstrated informative support, including the sharing of common knowledge, reminding each other about important matters, and learning new things. The reminders about important things were seen as a significant form of informative support. The respondents explained how they would be reminded of many forgotten things or tasks during the early morning discussions, and these things or tasks could then be performed or written down after the session.

"It sure does give ideas, you get confirmation of some ideas, and other things are like 'I suppose it could be like that'."

"I have often written things down, do this, remember this."

The objective relating to establishing the eService as an early week routine did not succeed with regard to the userdriven approach. This is explained by the fact that participants have other discussion sessions alongside the programmes, and by the important role of the coordinators as instigators and discussion leaders. There has been a clear demand for a dedicated service such as the one provided by the project workers. Cooperation stretching back a number of years, familiarity, and support based on emotional caring (see Hokkanen & Astikainen 2001) explain why the role of the coordinators was perceived important, even surprisingly so.

Case eClub

The participants of CaringTV eClub included two elderly groups which met simultaneously at two separate centres in Espoo. The club was coordinated and directed by a project worker, but programmes were also coordinated by many other people from students to peer instructors and experts. The eClub was produced both at Laurea and at the service houses a total of 30 times in autumn 2010 and spring 2011. One volunteer from each group was in charge of the equipment and technical operation during the broadcasts.

Two different elder groups who met at different day centres were chosen as eClub members. One group (N=12) had been meeting once a week at the day

centre for a long time and took part in CaringTV broadcasts, usually twice a day. This group included elderly people with slightly impaired functional abilities who lived in their own homes. They were assisted and accompanied by volunteers at the day centre. The other group (N=11) consisted of members of a senior citizens' group in Espoo that had its own meetings at the day centre once a week. The members of this group were mobile and active elders.

The programme structure for the club's meetings was based on the requests of the club members. The average number of participants in eClub meetings was 17. Programme requests included topics such as travel reports, literature, quizzes, nature programmes, and factual programmes. During eClub meetings, the members went on an interactive trip together to the island of Santorini and on a virtual vineyard visit to the Rhine and Mosel valleys, they listened to the thoughts of an Espoo-based author about writing and the backgrounds to two of the author's books, and competed together in quizzes. The participants also produced some of the programming themselves. This included the presentation of spring-themed songs and poems to two groups of service house residents.

Club members received ageing-related information in a programme produced by nursing students about living wills and advance decisions, and programmes of the senior citizens' advisor and the home rehabilitation physiotherapist of the City of Espoo. The oral hygienists of the City of Espoo produced a programme about caring for dry mouth, and a speech therapist provided information about the effects of ageing on swallowing.

The club members expressed hope that these types of club activity could continue in the future.

"One always leaves here refreshed to go to the club upstairs."

"It is nicer to 'fly as part of a flock' (than taking part in the eClub from home, if the opportunity existed)."

Summary

The participation of the elderly in interactive programme production was generally viewed as very positive. Participation in CaringTV activated, invigorated and inspired the elderly. Targeted programme contents, such as exercise programmes, maintained and even improved the participants' physical health. Many interviewees highlighted the role of CaringTV in reducing loneliness and providing new contacts. Independent programme production by

elderly peers was also seen as valuable. The evaluations are summarised in the following table. (Table 5).

Table 5. Summary of assessment

PROGRAMME THEMES	OUTCOMES	TECHNOLOGY
++++ Programmes to maintain and promote physical health and mobility ++++ Activating programmes: Willingness to participate in the discussion, including after the programme Meaningful company in everyday lives Cultural and recreational programmes (music, calming and relaxing) ++++ Reminiscence programmes, quizzes: Refreshment of memory Positive competition within the group +++ Factual and informative programmes: Information ++++ Independent communication: Saturday café	Targeted and tailored programmes Participation Interaction Empowerment New relationships, friends: groupification, "big family" THE WILL TO LIVE AND COPE AT HOME At its best, CaringTV is a fixed part of group activities at the service house Discussions after programmes Requests: Uniformity in content between the CaringTV programmes and the thematic weeks at the service house CaringTV etiquette (code of conduct)	CaringTV faults: Sound problems
+ Satisfactory ++ Good +++ Great ++++ Excellent		

4.2 CaringTV as a Support for Family Caregivers

Elina Vuorio & Kaisa Jokela

Family/informal care refers to the care of an elderly person, disabled person or person suffering from an illness in the home environment by a family member or other close person. In Finland, informal carers' support is a statutory social service which municipalities must provide from allocated funds. Informal carers'

support refers to a package comprising the necessary services provided to the cared-for person and the compensation, breaks and carers' support services provided to family caregivers as determined in the care and service plan. (Informal carers' support, Guide for local authorities 2006.)

CaringTV for family caregivers was developed as part of the previous Coping at Home project of Laurea. In the project, four different user groups of family caregivers were identified: active users, silent users, occasional users, and giver-uppers (Pirainen 2008.) CaringTV as a support for family caregivers was tested in the Omana subproject of the Safe Home project. In Salo, the participants were family caregivers over the age of 65 who lived far from the city centre and support facilities for family caregivers. These aging family caregivers had demanding care situations at home. In the project, the City of Salo aimed to turn CaringTV into another form of service provided to family caregivers. The benefits officer for family care selected the clients for the project. First client selection took place in early 2009. There were 260 potential family caregivers in the focus group, and about half of them lived outside the centre of Salo.

The following sections contain the research results about the elderly family caregivers who used CaringTV as part of the SouthWest Finland subproject and about the experts of the City of Salo. The results are primarily based on interview data collected in 2011 which was analysed by qualitative content analysis. Corresponding data from 2009-2010 was also considered in the summary of outcomes as applicable. For household clients, data was collected in one-to-one interviews in clients' homes. Experts were interviewed in focus groups.

During the project, there were seven CaringTV units in the City of Salo. Due to changing circumstances, the units were in the homes of 11 different clients. Units were passed on due to the death of the carer or the cared-for person, and two carers chose to give the unit back due to a lack of time. Originally, the City of Salo had indicated that the unit should be returned within one month from when the family caring situation comes to an end. However, some carers felt it necessary to continue to have the support of the peer group - which they had found through CaringTV - even after their caring activity had finished. For that reason, two former family caregivers stayed on as clients until the end of the project.

The family caregivers who took part in the project felt that their physical health and wellbeing was satisfactory or good. All clients had illnesses, but none had problems with functional ability which would have affected everyday life in great

deal. The biggest problem of family caregivers was the life change, brought on by the caring duties, which meant giving up hobbies and social relationships. The carers mostly wished for more help with care at home. None of the clients used regular respite care breaks. The main reason cited was that the cared-for persons are in a worse or more confused state when they return home from respite care. Most of the clients did not use municipal home care assistance, nor did they feel the need for it. In two cases, the spouse of the carer received regular help at home.

Clients' experiences - "Mood-improving and psychologically important"

During the project, in addition to the general programming, the Salo-based group of family caregivers had the opportunity to take part in their own peer support group which had virtual meetings once a week. The group gave the carers an opportunity to discuss things that were on their mind. In addition, the group had regular visits from local experts, such as memory nurses, rehabilitation assistants, service coordinators and doctors. The informal care benefits officer was also actively involved in the group's activities. In addition to general programmes, peer support group meetings and one-to-one video calls between clients, the family caregivers could use the system for one-to-one video calls with the benefits officer.

All clients took part in CaringTV programmes several times a week or daily. One client was not an active user and only took part occasionally. With regard to the technology, all family caregivers had some technical problems which affected their participation in programmes and in one-to-one contact with other users.

According to the clients, mutual contact was the most important aspect of the programmes. All felt that interaction was smooth; some were more talkative, but everyone felt they could speak when they wanted to. Favourite programmes included discussion programmes, informative factual programmes, programmes about exercise and health, and programmes about cultural topics, memories and quizzes. The Salo group's own programmes were considered very important. The clients aimed to take part in as many group meetings as possible. With regard to the eServices offered as general programmes, the ePharmacy programmes produced by the Market Square pharmacy (Kauppatorin apteekki) in Turku were the most popular among the clients. The clients also followed other eServices with interest.

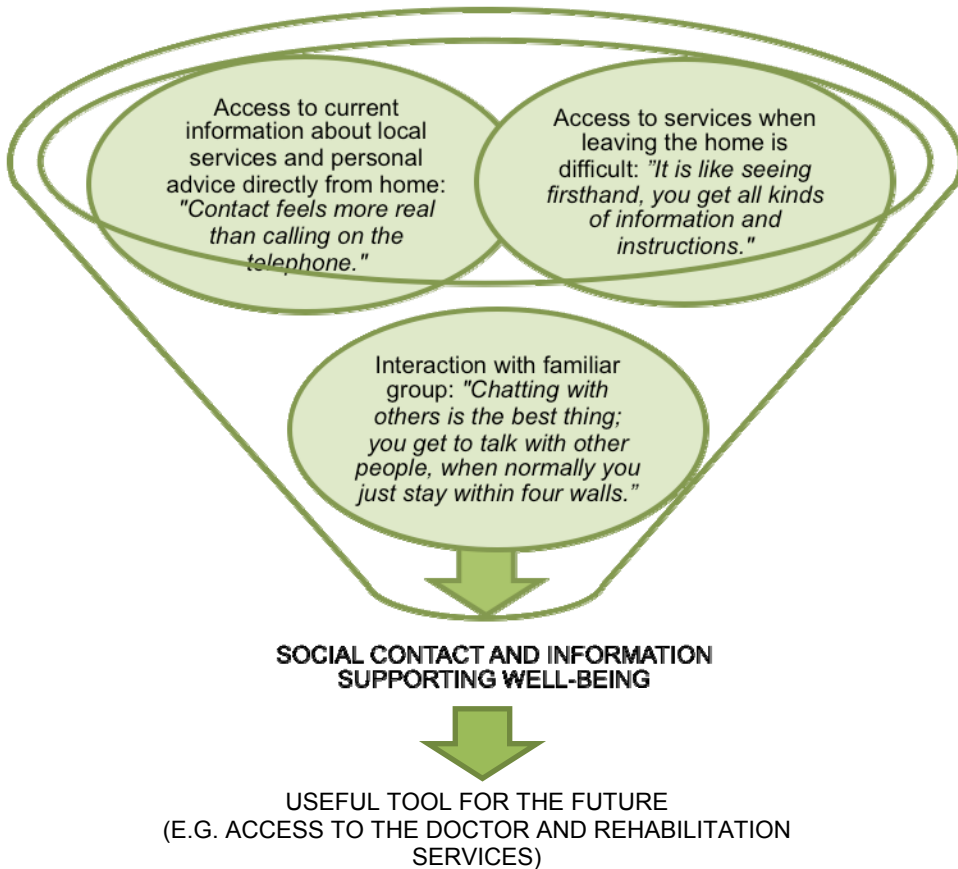


Figure 9. The role of the virtual peer support group

One client who took part in the final stages of the project did not see a personal need for CaringTV, although the client did have a positive opinion about the device and believed that it could benefit lonely family caregivers living in remote areas. Previously, two other clients had also wanted to give the unit back on same grounds. The majority of clients felt that CaringTV was very important and they were satisfied with the wellbeing benefits offered by the system. The carers' life was largely concentrated around their home environments, and they could not interact with their spouses as equal conversation partners. The clients felt that they would have felt lonelier without the system. Some described the system as an emotional outlet or lifeline. CaringTV also offered sense of security: the clients knew each other so well that they saw reason for concern if

one of the others did not come online. One of the clients did not necessarily want to continue accessing CaringTV services after the project, but others wanted to carry on using it. In addition to existing services, the clients were interested in testing other services such as virtual doctor's house calls.

Some clients were in touch with one another outside the programmes in one-to-one video calls. In addition, many stayed online after the programmes to continue discussion about topical issues. Some clients were in touch with the benefits officer in one-to-one video calls. Family caregivers who tested the service found it pleasant, as the combined sound and image made the communication feel more real than a telephone call. The benefits officer also saw the one-to-one video call as a positive option:

"For example, one family caregiver feels that the system gives security and form of communication. This person calls me nearly every day about different issues, so they do opt for the television; they no longer call me on the mobile."

Two family caregivers also had a video call option they could use with their relatives. The connection was not used often. Reasons for the lack of use included connection problems and problems with using the computer programme supplied to the relatives. Nevertheless, the relatives had positive views about the project and they felt that the system benefited their relative in general. The relatives felt that the video call was a useful form of communication. Seeing the picture was a nice bonus and gave more information about the relative's health than just hearing the voice.

Experts' experiences - "We will continue to actively deploy welfare technologies in the future"

The experts at the City of Salo noted that the communication, social networks and participation that took place via CaringTV was very important to the family caregivers. The unit provided opportunities for entirely new kinds of social interaction and social life, and it also provided a tool for mutual caring. According to the experts, the clients clearly liked the general programmes, and the Tuesday meetings of the Salo-based peer group were also fruitful.

The experts felt that family caregivers living in remote areas were the ones to benefit from the system most. The carers who took part in the project had challenging personal circumstances. In most cases, the cared-for person could not be left alone at all, and having contact with other people via the system was

very important. CaringTV was seen as something that promoted support, activeness and wellbeing for housebound people.

"If you consider that this provides a way to support them quite a bit in many issues and to provide stimulus in their everyday lives. All that is required is participation. So, whether it's a physical workout or a quiz, it does support their coping in different ways, that's what I believe."

The experts believed that the system will become a new tool alongside conventional methods. The experts from Salo who visited the programmes were excited about the new tool and method. CaringTV also brought changes to the work of the informal care benefits officer with the one-to-one video call option. The benefits officer believed that welfare technology will facilitate work reorganisation in the future. In addition, when calculating the costs and use of experts' time with regard to family caregivers, costs should be compared between virtual group instruction and (one-to-one) instruction implemented in a physical facility (for example, appointments with doctors).

According to the experts in Salo, CaringTV is a good tool for supporting family caregivers. At the moment, problems cited with regard to its adoption were its high price and technical problems. If unit prices can be made more acceptable and the technology made to work without interruptions, the units could be deployed widely as a support for family caregivers.

"We at the elderly services of the City of Salo have a strong feeling that we will actively deploy welfare technologies in the future [---] Based on this we know that there are client groups for which technology is exactly the right solution. It genuinely frees up more of our working time for those client groups that need additional human resources."

Case: Family Caregiver

The client is a 78-year-old family caregiver who lives in the countryside in Salo. Day to day, the client is coping well with other illnesses, but the cancer which has recurred after a few years worries the client. The spouse suffers from a memory-related illness and doesn't understand the severity of the illness and therefore cannot give support. The client does not use home care services; a cleaner visits every once in a while. The client is able to run errands in town once a week by travelling to the centre on the mobile supermarket bus. The client's children live nearby and they come and help when necessary.

The client's days are spent at home alone with the spouse. The spouse goes to a day group for sufferers of memory related illnesses twice a week. This gives the client momentary respite from the everyday duties. The client occasionally plays pétanque, although it has not been possible lately due to poor transport links. The client has been advised to regularly take the spouse to respite care in order to cope. The client has so far refused it as the spouse is more confused for an extended period of time after respite care.

The client participates in CaringTV programmes weekly, nearly every day. In particular, the client tries to take part in the local virtual peer support group whenever possible. Music programmes and quizzes are the client's favourite programmes. Factual programmes produced by students and experts have provided good information. With regard to the programmes provided by the Salo group, the client especially likes the doctor's programmes, programmes about memory, and free group discussions. According to the client, all services provided through CaringTV work well: "it is like seeing directly, and it provides all kinds of information and instructions". In the beginning the client had technical problems with the unit that were not anything to do with the client. The client nearly gave it up, thinking that s/he would never learn to use it. Now s/he would not give it away. "If it were now taken away, I would be sad". The client believes that CaringTV has had a positive effect on his/her mood. The client feels that it helps to make up for the lack of real company and socialising.

4.3 CaringTV as an Everyday Support for Elderly Clients of Home Care and Service houses in SouthWest Finland

Elina Vuorio

As part of the Safe Home project, five home care clients from Laitila took part in the OMANA subproject. The clients were born between 1922 and 1934. Two men and three women took part in the CaringTV® activities. The clients' personal circumstances varied quite a lot, and they changed during the time that the clients were involved in the CaringTV pilot. Most clients had long-term illnesses (e.g. diabetes, coronary disease, hypertension, osteoarthritis), and some had varying degrees of hearing problems. All participants were sociable and talkative, although it was manifested in different ways in CaringTV programmes depending on the individual. Some had mentioned in earlier initial interviews or feedback interviews that they had occasional bouts of depression, and some felt lonely. All home care clients in Laitila received regular home care (either home help or home nursing, on average 2-3 times/day), but most of them also received help with cleaning, bathing, shopping and for running various errands on a weekly basis. In addition, some received help from neighbours in their errands. The home care clients in Laitila had different hobbies based on personal preferences and time. These included reading, handicraft, watching TV, and keeping in touch with relatives and close friends. Some of the elderly people who took part in CaringTV activities were already familiar with new technologies. Some had actively used mobile phones and a few had used computers before the project.

In addition to the home care clients in Laitila, the SouthWest Finland subproject had elderly participants from service houses in the Turku region, including the following facilities: Kotikunnas, Lehmusvalkama, Portsakoti, Auralan Setlementti, and Laitilan Terveyskoti. A total of 29 service house clients and 17 reference group clients (Aurala) took part in the subproject and in the action research process. Compared to home care clients, the clients of service houses and Aurala had very different personal circumstances and they comprised a fairly heterogeneous group. On one hand, the participants of CaringTV included elderly people with poor physical functional ability who lived in service houses; on the other hand, there were some participants who were very independent and active senior citizens who participated regularly in activities such as the many senior activities offered at Aurala.

In all, the participation activity varied somewhat from person to person among the home care clients who took part in CaringTV activities in SouthWest Finland. One of the interviewees took part in nearly all programmes. Others tried to participate almost daily, although they were sometimes prevented from taking part due to other activities or illnesses, especially during periods of institutional care. The clients' experiences about the contents of CaringTV also varied somewhat, although certain popular areas could be identified within the group. (Figure 10).

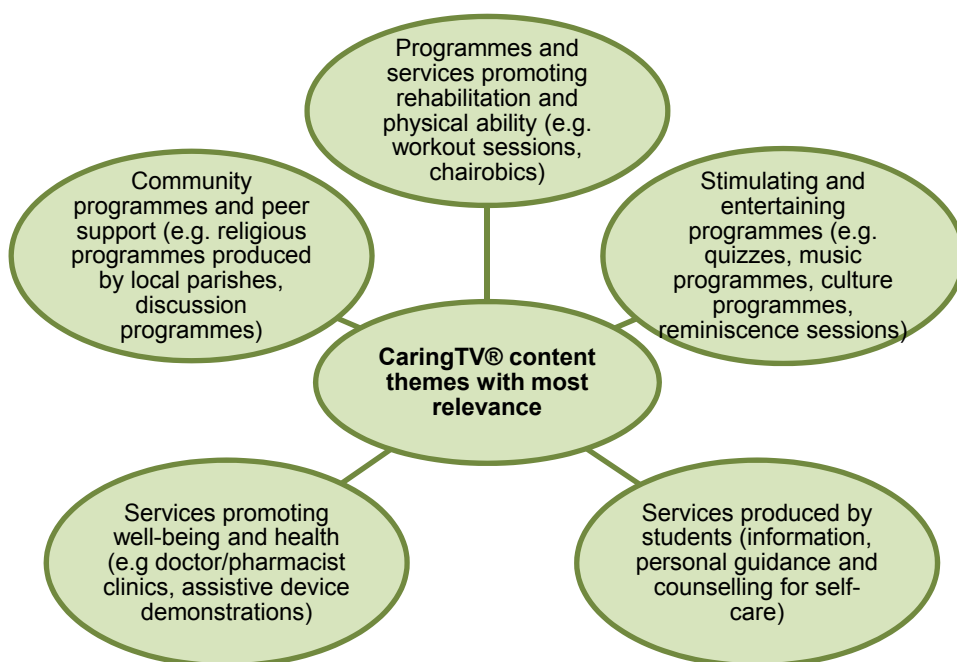


Figure 10. Themes of CaringTV content

The interviewees felt that both the morning programmes and the afternoon programmes generally fitted well in their schedules, although two interviewees noted that the morning programmes overlapped with the lunch delivery which interfered with their participation in the programme. All clients had recently had technical problems with the unit. When the unit was functioning properly, the interviewees felt it worked well both in terms of use and video/audio quality. All interviewed home care clients felt that CaringTV was a useful tool which provided variety, information and social contacts for lonely elderly people who spent a lot of time at home. Three clients have had the family connection feature

for keeping contact with relatives since spring 2010. The connection has worked well, it has been used weekly, and it is well liked despite technical problems which have been common at times.

The research results produced by analysing the experiences of service house clients somewhat deviated from the experiences of home care clients described above. The clients of Laitilan Terveyskoti (a group nicknamed "ukkokööri", which roughly translates as "the old codgers' group") took part in programmes on average once a week. The group mostly participated in the programmes of the TUPA channel which broadcasts in service houses in the Turku region. They also produced content for programmes. The interviewees felt that mornings were better broadcasting times from their personal point of view and in terms of the activities organised at Terveyskoti. According to the interviewees, the picture quality was good. The level of volume had improved, but it was still mostly too quiet due to the hearing problems of the client group. The hearing problems also meant that a member of the service house's staff had to be present to "interpret" the programmes. The interviewees felt that CaringTV is useful, as regular clients do not have rehabilitation sessions all the time, which means that they occasionally have spare time. The clients of Lehmusvalkama and Portsakoti participated in the programmes occasionally. It was difficult to find a weekday that suited everyone, as the service houses have a lot of other activities. According to the service house clients, activity programmes and those that stimulate the mind were their favourites.

Case: Home Care Client

The client is a diabetic who is on regular medication. He has suffered a left-side stroke which affects his coping at home with everyday tasks. The client starts the day with a newspaper and a cup of coffee. Due to his diabetes, he measures his blood glucose level 7-9 times a day. The client's daily routine normally includes a lot of outdoors. The CaringTV programmes have a significant influence on the client's daily life. In terms of social relations, the client mentions that his niece and great-niece are important people in his life. The client is in telephone contact with them every week. The client also talks to his brother regularly on the telephone. The client has close friends who live in the neighbourhood and meet regularly with him. The client has made new friends with some of the users of CaringTV. Currently, the client is coping well with living at home with some assistance. In the interview, the client emphasised the importance of the help he receives from neighbours. Without the neighbours'

help, the client would require new services, for example in running errands. At the moment, the client uses the meals and cleaning service, a safety bracelet, and a daily check by home care services. In addition, the neighbours do his grocery shopping and pharmacy errands.

The client has been a very active user of CaringTV from the start. He takes part in programmes whenever possible, practically every day. In terms of content, the client highlighted ePharmacy programmes and the programmes of Lahja Isotupa as most interesting. He also added that with the exception of workout sessions, he likes all the programmes. The broadcast times have fitted well with the client's daily rhythm. In his opinion, interaction in the programmes has worked well. With regard to eServices, the client was familiar with the programmes of the pharmacy, parish, assistive device clinic, nurse, police and lawyer. According to the client, the eService programmes provide a lot of information and the opportunity to ask questions. The client has had active contact with other CaringTV users outside the programme times. An important factor to him is the fact that the picture makes the contact more intimate. The fact that the connection doesn't cost anything has also increased the frequency of contact. The client considers the unit to be very easy to use. There have been occasional technical problems.

Based on his experience, the client considers CaringTV an invaluable help. He strongly believes that he would have to rely on psychiatric medication again if the unit were taken away from him. The client hopes that he can continue to have access to the current types of programmes in the future. Furthermore, he definitely wants to carry on watching the programmes after the project has ended. In the interview, the client said that the experiment had made a huge positive change in his life. His visits to the doctor have become less frequent during the trial. The client has made new friends via CaringTV, and he is in regular contact with them. During the interview, the client stressed that he does not believe he would cope as well without CaringTV. His experiences are corroborated by similar comments from the representatives of home care services:

"Yes I can say that the client has changed since he got this device. His general health has improved and it may be that we have avoided institutional care thanks to this."

"From the municipality's point of view, the initial thought was that the units would be passed around more. But the reality proved different, since the units could not be taken away from clients just

like that. Therefore, the units have been passed around naturally based on the clients' personal circumstances and needs, rather than concentrating on increasing the quantity of trials."

Case: HyMy Group at the Kotikunnas Day Centre

The HyMy group at the Kotikunnas day centre is a group of people born between 1921 and 1939 who take part in CaringTV activities. The group includes six women. All interviewees had been diagnosed with a long-term illness or disability. These included musculoskeletal disorders, asthma, diabetes, cancer, coronary and cerebrovascular disorders, cardiac failure, spinal tumour, hypothyroidism, sleep problems and chronic depression. One had been diagnosed with incipient memory disorder.

Four interviewees received help from the home care services of the City of Turku. Three of them received one daily visit. One elderly person received three visits per day. The content of the visits varies slightly between clients, but most include assistance with dosing and/or taking medication, heating up food, bathing, laundry and grocery shopping. Five interviewees get help with cleaning (on average twice per month) - the majority from relatives, husbands or private service providers, with the exception of one interviewee who receives help via the Disabled War Veterans' Association. Three of the six elderly interviewees said they performed their errands (banking, insurance, etc.) independently; others received help from relatives. The limited mobility of the interviewees had forced many of them to give up hobbies in which they had been active previously.

The HyMy pilot group at Kotikunnas participated in CaringTV programmes once a week. The group met regularly every Tuesday morning since its launch in October 2009. The group members saw themselves as likeminded, lonely people who were helped by the presence and support of others in order to cope with their everyday lives at home. The Kotikunnas HyMy members have actively participated in various programmes broadcast on Tuesdays. In particular, programmes that support physical activity have been well liked. The group was particularly fond of the balance exercises coordinated by physiotherapy students. The representative of Kotikunnas confirmed this. Group discussions have also been interesting. Quizzes, riddles, singing and music programmes were also liked. The group members were less interested in expert programmes,

such as those discussing different illnesses and self-care. The programmes worked well, although technical problems interrupted discussions at times. Picture quality was seen to have improved during the trial. The interviewees felt that they had benefited both from spending time together and from various physical workout programmes. The following are direct quotes from group members (A 1 – A 4) about how useful they found the participation in CaringTV activities:

"10+, I have liked coming here and will continue to come. You will not be misunderstood in this company."

"Spending time together and chatting is good for the mental health."

"This activity is the best thing in my life at the moment. It gives substance in life, we share things."

"The activity is important to me as my relatives live far away."

4.4 CaringTV Programmes in the Disabled Group

Paula Lehto & Riitta Matero

According to estimates, approximately 250,000 people in Finland - five percent of the population - have a significant handicap or disability. The number of people who need various services to support their day to day lives due to disabilities is estimated at 20,000-40,000, which equates to 0.4%-0.8% of the population. Adequate services and support functions to ensure appropriate living arrangements for disabled people are very important to all service users and their relatives. (Quality Recommendation for Housing Services for People With Disabilities 2003.) In the case of people with severe disabilities, the concept of housing is very close to the concept of living. Living arrangements dictate to what extent the person can control his or her own life and take part in societal activities. (Kotiranta 2008.)

The lives of disabled people can be full of challenges which can have an effect on many areas or only impede certain functionalities. In addition to high-quality health care services and other support services, various technological solutions have emerged which can help and facilitate the everyday lives of disabled people and bring the quality of life to a level that corresponds with the individual's personal needs. The UN convention on the promotion of equal

opportunities for disabled people includes the principle of equal opportunities which states that all societal and environmental systems should be made accessible to all, and especially disabled people (The National Council on Disability VANE).

CaringTV and other technological solutions as tools to support the everyday lives of people with developmental disabilities were piloted in the Ehyenä subproject of the Safe Home project. Lyhty ry, a Helsinki-based organisation providing living and work activities for disabled people, and the housing unit of the Kuusankoski-based Aspa Housing Services Foundation took part in the project.

The focus group of the Safe Home project included people with developmental disabilities (N=12) and experts (N=14) from two different units that provide round-the-clock support and care. Research data was collected from the disabled people and the experts caring for them. The data collection methods were one-to-one and group interviews (three in total). Focus groups interviews were used for collecting data from the experts. Research data was analysed by qualitative content analysis and using Glaser's (1976) Six C's model. The aim was to gain understanding of the circumstances and everyday coping of disabled people. Based on the data, the overall structure and themes were formulated for the development of CaringTV to meet the needs and expectations of disabled people.

The first stage of data collection provided a general picture of the everyday lives of disabled people and a structure for programme themes to support their independent living. The challenges and difficulties faced by people with disabilities usually involve loneliness, lack of initiative, dependency, and strong attachment to everyday routines and habits. Frustration, unclear communication and unpredictability can come out as angry behaviour in some participants. On the other hand, positivity, cheerfulness and the courage to approach another person promote enthusiasm and activity.

Based on the data, the following themes were identified as the structures and subjects for interactive programming and services (Figure 11):

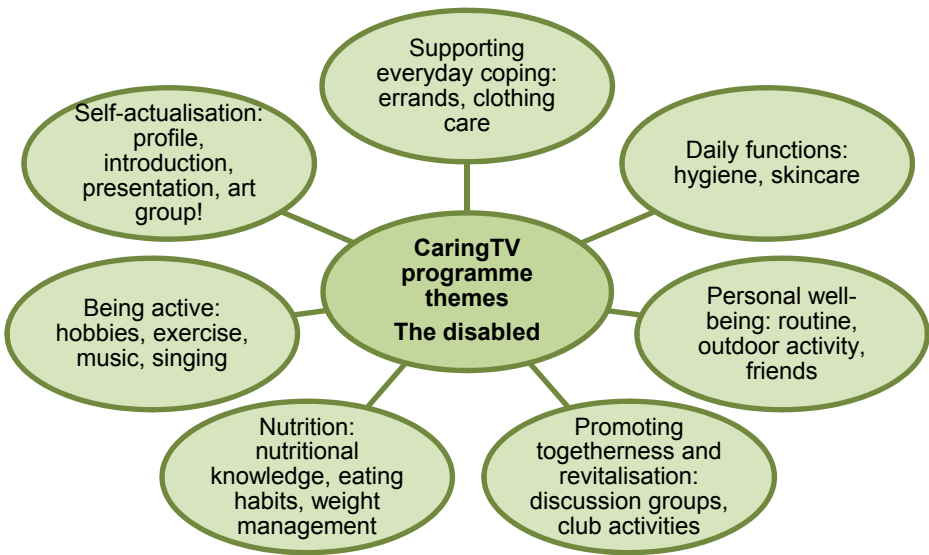


Figure 11. Programme themes for people with developmental disabilities

The disabled participated in programmes produced on CaringTV either as a group or from their own homes using personal monitors. Interactive programmes to support the wellbeing and everyday lives of the clients were produced from Laurea twice a week, on Mondays and Thursdays from 4.00 PM until 4.30 PM. The programmes were produced by Laurea UAS students and experts representing different fields. The empowerment of the clients was supported by offering them the opportunity to take part in programme production.

Table 6. CaringTV programming

Theme	Example of content	Total no. of programmes
Activation	"Balance and body control exercises"	80
Self-expression	"Story hour"	11
Coping with the everyday	"Me and My Life"	4
Daily activities	"Cleanliness is next to godliness"	3
Personal wellbeing	"Great emotions"	4
Togetherness and revitalisation	"Music Quiz"	43
Nutritional knowledge	"What and when do you eat"	7
		Total: 152

A total of 152 individual CaringTV programmes were produced between 7 September 2009 and 30 May 2011. The "Activation" category had the highest number of programmes. There were 80 programmes related to exercise. The "Togetherness and Revitalisation" category had the second highest number of programmes (43). The total number of programme participants was 1,108. The average number of participants per programme was 7.2 clients.

Participation in CaringTV programmes quickly became an important shared activity for the participants. Clients took part in all programmes, personal circumstances permitting. Some residents quickly learnt to use the CaringTV units independently, and some needed assistance from staff members. The aim was to take everyone into account in the programmes. One challenge with regard to interaction concerned those clients who had speech impairments. They needed help from other participants to communicate with the group. It is important for the clients' self-esteem that they are heard and understood as much as possible. Brain stimulation and activation can be supported through interactive programmes on CaringTV. Programme themes that are based on dialogue and conversation promote an elderly person's ability to communicate and interact. Reminiscence, newspaper reviews, quizzes and proverbs are good

examples of programmes that support interaction and communication. (MacKenzie 2000.)

Implemented eServices

In accordance with the project objectives, a number of eServices were implemented and piloted with the disabled participants. FysioSporttis Ltd, one of the project partners, produced virtual one-to-one consultations with three clients via CaringTV on 14 separate occasions. In these sessions, a physiotherapist reviewed the client's health history and current health and provided help, support and guidance with identified issues. Personal, written and illustrated exercise instructions were drawn up for each client to enable them to do the agreed exercises and look after their personal wellbeing. Consultations by sexual therapists were also piloted with three clients on six occasions.

eChats between clients and project workers (n=139) which were instigated by a request from the clients themselves were implemented and piloted in the project. The request was noted, and the eChat sessions continued almost weekly with three clients until spring 2011. The sessions quickly became important meetings both to the clients and the project workers, providing an opportunity to exchange thoughts about topical issues, to reminisce about past events, and to ponder the future.

Case Description: Welfare technology as an enabler of independent living

The Safe Home project and Lyhty ry, an organisation providing living and work activities for the disabled, implemented a pilot programme to test how welfare technologies could be used to help disabled people to live independently.

The pilot client selected by Lyhty was a female whose living arrangements had been a subject of discussion at the unit for some time. The occasionally impulsive and aggressive behaviour of the woman posed challenges to the staff and caused fear among the other residents of her unit. It was for these reasons, among others, that the staff had begun to consider finding the woman her own apartment near the Lyhty House. Around that time, Lyhty ry became involved in the Safe Home project and saw that independent living arrangements for the woman could become a reality with the help of the technologies and staff support offered by the project.

After a long search, an apartment was found for the woman in the vicinity of Lyhty House. To support her independent living, the client was provided with a CaringTV touch screen and a Vega safety bracelet. The woman practiced using the CTV touch screen device with the staff before moving to live on her own. Although CTV's operating system was designed to be as easy to use as possible, a number of challenges arose during its use. Due to the client's poor cognitive skills, features such as the design of the CTV operating system's touch buttons was implemented with symbols. This change and frequent practice with staff members helped the client to understand the buttons, and daily calls with the personnel of Lyhty began to go smoothly. Using the video connection, the staff were in touch with the client day and night.

The client's living arrangements were also made safer by the Vega safety bracelet from Everon which provided fast voice contact with Lyhty nurses with a touch of the emergency button. The staff would assess the situation during the call and decide whether further action was needed. The safety bracelet also had a GPS locator which could be used to track the client in the event that she got lost.

For the Safe Home project team, one particular benefit of testing the equipment with the Lyhty client was that the suitability of the technology was tested with a genuine client with genuine needs, in a genuine user environment. The user experiences that were gained from using technologies supporting independent living have been an important part of development in the Safe Home project, while at the same time the technology has enabled the client to live independently in her own apartment instead of an institution.

A userdriven DVD about the case was produced in the project. The DVD explains how the use of welfare technologies has enabled the client to live on her own.

The meaning of CaringTV as perceived by the disabled participants and the experts is analysed in the following figure. (Figure 12).

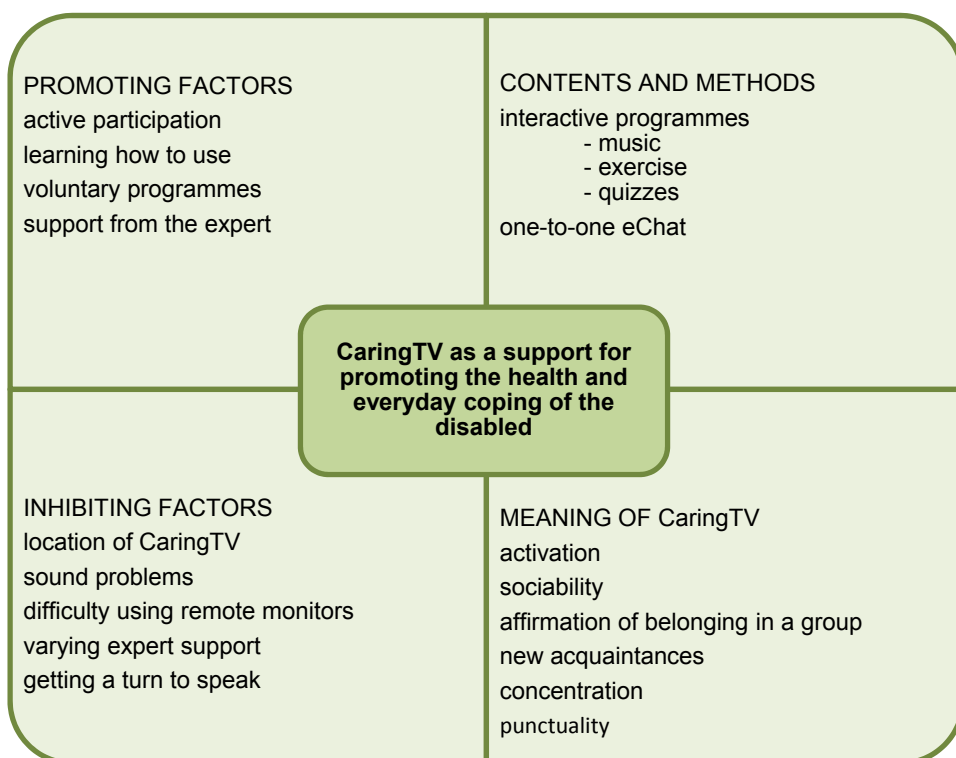


Figure 12. CaringTV with and for disabled persons.

Based on the evaluation data, the promoting factors for the suitability of CaringTV to promote the wellbeing of disabled people and to support their independent living include: active participation, learning to use the CaringTV equipment, self-motivated programme content, and expert support. Inhibiting factors include the physical location of the CaringTV unit, sound problems during the programme, difficult-to-use remote monitors, varying degrees of expert support, and getting a turn to speak during the programme. CaringTV contents such as music, exercise and quiz programmes were suitable and popular. The continuity of eChat and the personal nature of content made it an important eService to the disabled. The evaluation and meaning of CaringTV was linked to activation, sociability, and a strengthened sense of belonging to a group. The ability to make new contacts via CaringTV was also important. Other significant feedback relates to the promoting influence of the ability to focus and punctuality.

4.5 CaringTV as a Support in Group Activity For Mental Health Rehabilitation Patients

Annika Isaksson, Paula Lehto & Johanna Leskelä

In mental health rehabilitation, the objective is to promote the patient's ability to cope as independently as possible in taking part in the society (Finnish Ministry of Social Affairs and Health, 2001). A long-term mental illness can impair the skills that a person needs in order to live independently. Initiative and interest in one's own life are reduced, while the ability to engage in activity that requires longer attention span diminishes. The need for external help and dependency on others increase. Examples of problems related to living arrangements include the inability to cope with domestic chores independently, the fear of living alone, and other types of need of supervision. (Finnish Central Association for Mental Health 2011).

Mental health problems and treatment have changed considerably over the last few decades. New knowledge has led to new challenges with regard to what is expected from rehabilitation. A key aspect of rehabilitation is the individual's right to have a good life. The basic question is how to secure rehabilitation services of high ethical standards that are aimed at promoting the individual's welfare while ensuring social benefits. (Koskisu 2004.)

Rehabilitation requires space, time and support to allow the patient to process the information and to find ways to bring clarity to his or her personal situation. The value given to the patients' own experiences, mutual support, and equality of interaction are key objectives of rehabilitation. (Finnish Central Association for Mental Health 2011, Koskisu 2004.) For mental health patients, peer support means systematic support activity on a one-to-one basis or in a group. In peer support activity, the participants are equal and they usually both give and receive help. Peer support is based on equality between people with similar experiences and phases of life, the opportunity to be heard and understood, togetherness and mutual support.

In recent years, the objective at society-level has been to ensure that people could live at home as long as possible. Support for independent living and coping with everyday life has been provided by various means, for example, by developing technologies that promote independence and participation. According to Suhonen & Siikanen (2007), welfare technology refers to a positive solution that promotes welfare. However, in social and health care, technology does not have purely positive connotations - it can be understood as a reference

to a world of technical devices where caring and human interaction disappear as technology becomes more widespread. (Suhonen & Siikanen 2007.)

The mental health patients who took part in the project were clients who participated in group activities (N=4). The purpose of CaringTV was to provide guidance and tips for coping with the everyday life, and uplifting ideas to support rehabilitation. The activities were designed to support and complement the versatile services provided to the mental health patients. The patients who took part in the project lived in their own homes with some support and took part in group activities designed to support and monitor the patients' independent living, to promote their self-initiative, and to provide opportunities for social interaction and peer support. The patients took part in CaringTV programmes in groups twice a month. The group size was small from the beginning of the pilot. Some group members left and were replaced during the course of the project. The group requested that another group of mental health patients be introduced to CaringTV programmes to make the interaction and peer support more versatile. In early 2011, a second group of mental health patients was recruited, and the members took part in CaringTV programmes once a month. However, no suitable time for both groups could be found, as the two groups met on different days.

The programme themes that emerged out of the interviews were recreation, self-care, coping with the everyday life, and a healthy lifestyle. (Figure 13).

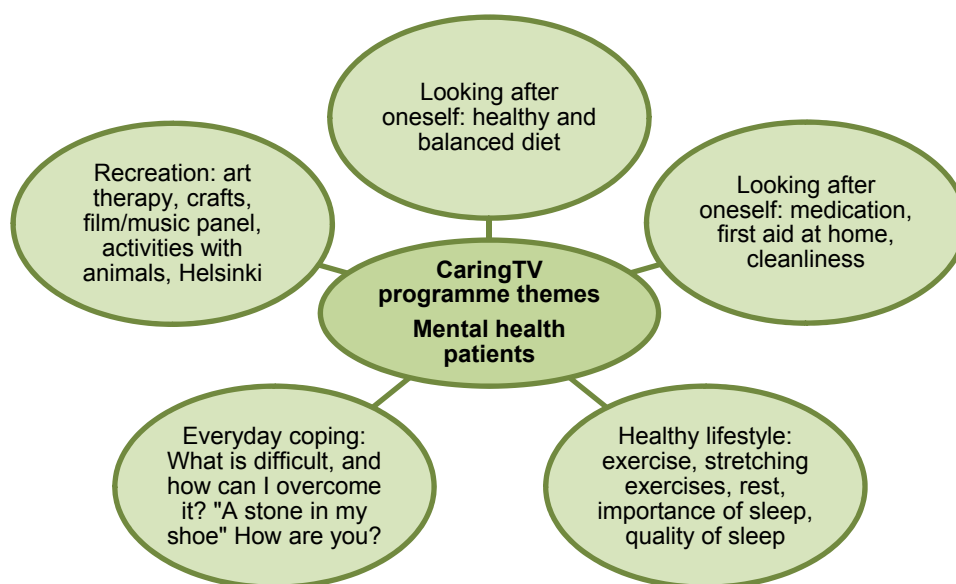


Figure 13. CaringTV themes for mental health patients

Participatory programmes about these themes included nutrition, exercise, self-esteem, etc. A total of 31 programmes were broadcast to mental health patients during the project. (Table 7).

Table 7. Programmes for mental health patients

Theme	Example of content	Total no. of programmes
Recreation	"Music Panel"	8
Self-care	"Healthy nutrition and exercise" "First aid at home"	5
Coping with the everyday	"Using money" "Good self-esteem"	5
Healthy lifestyle	"Importance and quality of sleep"	13
		Total: 31

Case: Mental Health Rehabilitation Patient

Students and experts produced interactive programmes for young mental health patients in a group format. The programmes included themes such as good self-esteem and health lifestyle. Two programmes about self-esteem were produced by a nursing student. Interaction during programmes was pleasant due to the presenter's ability to consider the needs of the sensitive target group and to engage with the situation. During the programmes, participants found the courage to discuss issues such as bullying at school, which all participants had experienced. Discussions continued long after the programmes both on CaringTV and with local therapists.

Nursing students produce a series entitled "Terveen elämän reseptejä mieleninterveyskuntoutujille" (Recipes for healthy life to mental health patients) designed to improve the patients' awareness about nutrition and to help them choose healthier options in their daily diets. In the programmes, the participants discussed issues such as their eating habits in relation with weight management. Healthy food options were presented, and the participants were sent recipes to try out.

In spring 2011, a group-based discussion group led by an ePhysiotherapist was piloted with mental health patients. The physiotherapist was studying to become a psychotherapist, which gave rise to the programmes' theme, "the role of exercise in personal wellbeing". During the programmes, the participants and the coordinator discussed questions related to exercise, diet and wellbeing. The calm and confidential atmosphere of the programmes encouraged the participants to openly discuss their experiences and feelings about exercise. The participants were able to discuss even the most sensitive topics, thanks to the familiarity of the coordinator who led the programmes throughout the entire series. On the other hand, some patients needed encouragement to go forward with some of their issues.

One of the programmes focused on hobbies and the role of exercise in the patients' lives. The clients were encouraged to proactively look into continuing their old hobbies. As a result, one patient found an amateur football team online which he could join to carry on with his old hobby. The programme and discussion on CaringTV encouraged and supported the patient's own motivation to find information about teams and to return to football. One patient received instructions and encouragement for going to the gym. The mental health patients

saw these co-participatory programmes and discussions as some of the most important parts of the CaringTV offering.

The following figure provides a summary of evaluations about the implementation of CaringTV based on data collected during the assessment stage. The mental health patients' participation in CaringTV programming is examined from the point of view of promoting factors, inhibiting factors, contents and methods of Caring TV, and its meaning. (Figure 14).

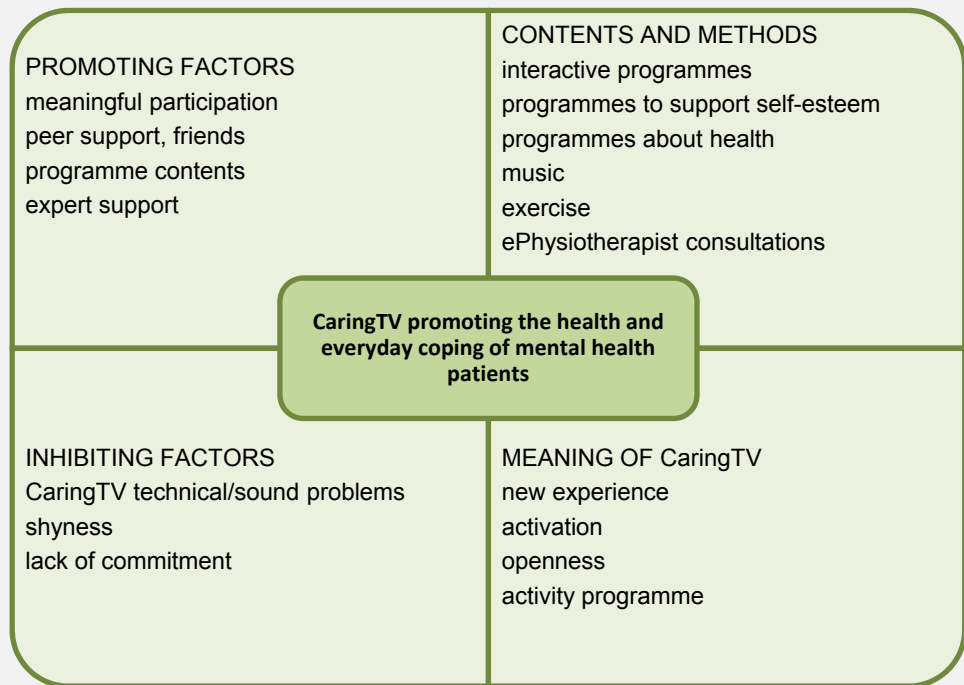


Figure 14. Conceptual model: CaringTV with and for mental health patients.

Promoting factors of CaringTV for the health promotion and everyday coping of mental health patients included the meaningfulness of participation, peer support/support from friends, programme contents and the support of a professional. The appeal of programme contents significantly promoted the enthusiasm and participation of the small group of mental health patients. Inhibiting factors were technological problems related to CaringTV. Technical problems were specifically important as inhibiting factors, since the mental health patient group participated in the programme only once in every three

weeks. The vulnerability of the client group and the fluctuating personal circumstances were projected as timidity and lack of commitment. In terms of content, the most successful interactive programmes were about topics such as supporting self-esteem, health-related topics, music and exercise. The meaning of CaringTV rose out of the participants' interest in trying something new, activation, and openness. Activity programmes in which clients were themselves involved made their participation in CaringTV meaningful.

4.6 Interactive CaringTV as a Support For Young People

Paula Lehto, Johanna Leskelä & Riitta Matero

Promoting the engagement of young people is an important aspect of youth policy. The objective of engagement is to prevent isolation and to promote co-activity, socialisation, and social integration. Many indicators suggest that the wellbeing of children, young people and young families has deteriorated since the previous recession in the 1990s. Problems related to substance abuse, behavioural problems and mental health problems have become more common, and as a result, the need for welfare services has increased and their availability has even decreased in some cases. (Hämäläinen 2008.) According to the statistics of the National Institute for Health and Welfare, in 2009 a total of 709 young people and their families were supported by child welfare services in Espoo. Of these, 616 children were 0-17 years of age, and 93 were 18–21-year-old clients of after-care services. (Kuoppala & Säkkinen 2010.)

Young people's engagement should ideally be promoted through a preventive and future-orientated approach. Engagement as a goal is a positive state. Especially the sense of belonging to a group promotes young people's wellbeing, quality of life, and life management. Engagement is usually examined on two levels: functional and social inclusion. Functional inclusion refers to the person's participation in society, which is a progressive growth process for a young person. Another level is social inclusion, which refers to the person's social identity. According to Hämäläinen (2007), the engagement of young people can be examined through the three dimensions of welfare inclusion: financial, social and educational. In a young person's life, the social dimension develops based on education, transition into working life, and the culture.

One of the client groups included in the Safe Home project consisted of adolescent clients of child welfare services (N=28). Six of these were after-care

clients, and 17 lived in a family support unit or in a home environment. The average age was 15.6 in family support centres and 18.4 in after-care. Nearly all were currently in or had left comprehensive school or vocational education.

Social care professionals were also included in the study (N=27). The professionals were social workers from social services or other units providing services to the young clients. The average age of the experts was 43.8 years. Over half of them had a higher university degree (professional title of social worker) and others had lower degrees (e.g. social instructor) or a vocational qualification (coordinator). Over half of the experts had over 10 years of work experience.

The research data was collected in one-to-one interviews with the adolescents in the beginning of the project and at the time of the individual leaving social services. Data was collected from the experts mainly in focus group interviews which were carried out in three different stages. The research data indicated that the difficulties of the adolescents were mostly related to their relationships with parents and family, school, chaotic or irregular lifestyles, or psychological problems. In some cases, the situation had led to substance abuse, loneliness or even the lack of will to live.

CaringTV programmes were transmitted from Laurea once a week at 5 PM - 5.30 PM. The programmes were mostly produced by students completing advanced studies in child welfare, and other professionals. Some of the youth also produced their own programmes. Based on the combined data, the following topics were identified as themes for interactive programming to the adolescents.

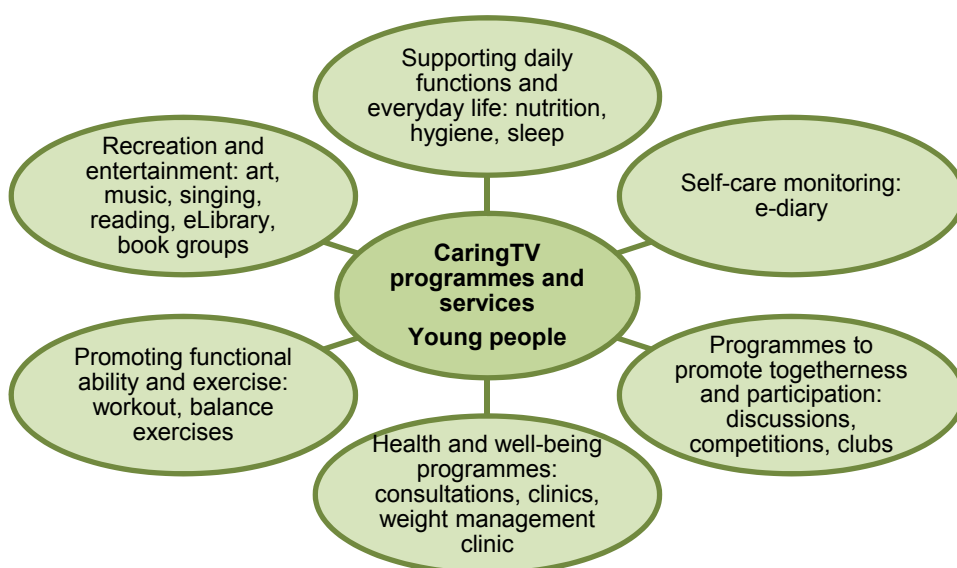


Figure 15. Programme themes for the young people

Table 7. Programming for young people, Autumn 2009 – Spring 2011

Theme	Example of content	Total no. of programmes
Supporting identity in young people	"My friends are pressuring me - what should I do?"	22
Supporting schooling and studies	"What am I going to be when I grow up?"	4
Supporting hobbies	"All about music - music as a hobby"	28
Supporting social relationships	"Friendship"	10
Supporting health and wellbeing	"Health, lifestyle, alcohol and drugs"	15
		Total: 79

Out of all programme themes, activity programmes and those produced by the young people themselves were seen as most rewarding and interesting. Sensitive topics proved challenging both to the young people and the programme producers. The project parties were aware of programme contents in advance - in the future, sensitive topics will require active roles and responsiveness from the workers. According to the experts' views, it is important to ensure that discussion about the topic continues with the young people after the programme. Furthermore, if a young person has thoughts or concerns related to a topic, it should be discussed further in one-to-one meetings with the personal therapist. From the point of view of young people, cooperation between the young person and a professional (e.g. a personal therapist) is important in programme production.

The following figure summarises the evaluations of how well the themes were implemented both in terms of content and technology. The adolescents' participation in CaringTV programming was examined from the point of view of promoting factors, inhibiting factors, contents and methods of Caring TV, and its meaning. (Figure 16).

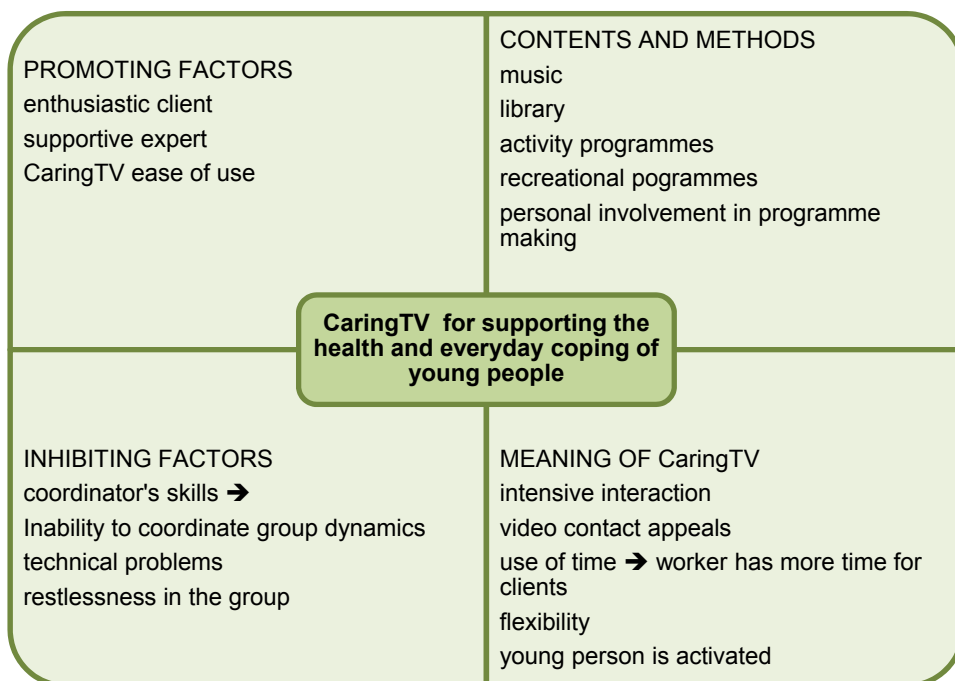


Figure 16. Conceptual model: CaringTV with and for young people

Promoting factors included the enthusiasm of the young client or the expert. Coordinators and personal therapists had an important role in encouraging the young people to participate in the programme. An interesting fact was that the young people saw the possibility of using technology - such as cameras - and their ease of use as a promoting factor. On the other hand, inhibiting factors included the programme producer's limited - even insufficient - skills in group dynamics or group coordination. Restlessness within the youth group was also seen as an inhibiting factor. This was especially the case when two groups from different units participated in the programme. Technical faults were also an occasional inhibiting factor. With regard to the contents and methods of interactive programmes, the group mentioned programmes about music, library and hobbies. Functional programmes and those produced by the youth themselves were particularly interesting. The meaning of CaringTV included the intensiveness and closeness of interaction, the enthusiasm of the video contact video connection, and the youth's own activeness. From the workers' point of view, the relevance of CaringTV was related to the use of time and the

opportunity to spend more time with youngsters who have special needs. Flexibility was also highlighted as significant. Feedback about the participation in interactive programmes and its influence in the everyday life of the young people is difficult to evaluate. One active and enthusiastic professional noted the following about the effectiveness of CaringTV:

"Little things to support young people for life"

With regard to the youngsters' point of view and feedback, the following quote is from the milestone assessment data:

"Are they actually making programmes for us..."

5 PROJECT ASSESSMENT AND EFFECTIVENESS

Paula Lehto & Johanna Leskelä

5.1 Assessment of CaringTV From the Users' Point of View

The evaluation research of the Safe Home project consisted of a review of the processes and their effectiveness, and the feedback of the project participants. Evaluation data was collected with focus on evaluating wellbeing as perceived by the client, economic efficiency, technologies, competence and the environment. Wellbeing was examined from the client's point of view, which meant examining the client's experience of participating in CaringTV programmes and eServices, and their influence on the client's everyday life. The professionals' views about client wellbeing were also examined based on feedback data. The economic aspect of the study refers to the production of models and process descriptions for selected eWellbeing services, which included establishing the costs both for current and new practices.

The environment and technology aspect was examined with focus on the integrability and suitability of technologies. Functionally impaired elderly people as a user group have special requirements with regard to the usability and accessibility of equipment (Topo 2008). These requirements also apply to the interfaces piloted in the Safe Home project, such as the CaringTV and telecare interfaces. The main objective of this project and service concept was a high level of satisfaction amongst the users, which meant that satisfaction with equipment and the interaction opportunities related to the services were significant. Usability comprises the learnability, accuracy, memorability, efficiency and comfort of use. (Sinkkonen, Kuoppala, Parkkinen & Vastamäki 2002.) In practice, this includes factors such as how fast the user learns to use the equipment and feels that he or she understands how the equipment works. The operating logic must be simple and allow errors. (Saalasto 2009.)

Accessibility poses challenges with regard to interface design: the physical appearance and workings of user equipment must be designed to provide access to people with poor vision and varying degrees of mobility issues and cognitive problems (e.g. poor memory). (Nielsen 2000.) The availability of hardware and software used in the solution provides an indication of reliability (errors do not prevent operation) and whether the service is available at all

times. Availability and reliability are closely linked, which indicates the equipment's ability to provide the required functions without errors. The concept of reliability also includes the product life of the solution, i.e. how long it can be used before it becomes obsolete. The use of the hardware and software at another level - for example in communications between elderly people and their relatives, or between young people - requires that the software is compatible with common PC systems and internet technologies. (Saalasto 2009.)

In the Safe Home evaluation research, technological functionality was evaluated with regard to usability and other criteria. The telecare system is presented in a case study. In addition to client groups, it was important that the equipment was tested by social and health care professionals who were actively involved in the production of eServices and regularly used the equipment.

With regard to the competence/professional aspect, the evaluation focused on the attainment and updating of competence during the project. This kind of optimal combination refers to the ability to repeatedly observe new, analyse, interpret and propose new ways of action in an evolving environment. This concerns the expert's knowledge of the task, problem-solving skills, networking, situational sensitivity, flexibility, and the ability to adapt to new kinds of environments (e.g. Eteläpelto & Tynjälä 2005; Kirjonen, Remes & Eteläpelto 1997).

The field of social and health care has a lot of tacit expert knowledge which needs to be made explicit. In the Safe Home project, the experts' point of view was taken into account in different stages of the project process, for example in the planning and implementation of eService contents. The experts and their feedback have been important in interpreting and making corrections to the data gathered in the action research process. This ensured that the experts' voice and views could be heard and data was interpreted at the local level. By analysing data on a continuum in the action research process, positive/promoting factors and negative/inhibiting factors to clients' wellbeing could be identified in order to evaluate the role of technology from the point of view of clients and experts.

In other words, the effectiveness study of the Safe Home project was based on the effectiveness framework for science, technology and innovation proposed by the Academy of Finland and Tekes. This means that effectiveness is examined from the point of view of 1) the economy and regeneration, 2) the environment, 3) learning and competence, and 4) wellbeing. (Effect of Tekes and Innovation Activities 2011.) The Safe Home project was aimed at investigating how the

video-based interactive eWellbeing services were realised and formed, and what were the costs of implementing the new practice. The project offered an opportunity to expand the idea of the caring environment to the home environment. A virtual environment also facilitates designing and developing different types of facilities.

Evaluations of the implemented technology, programmes, selected eServices and further challenges are presented in the following table. The assessment is based on feedback data collected from participating clients, experts and businesses. (Table 8).

Table 8. Global evaluation

User	CaringTV	Programmes	eServices	Challenge
Elderly people (private individuals)	Touch screen: +++ Easy to use +/- Sound	+++ Content +++ Methods used +++ Interaction +++ Continuity +++ Possibility of independent contact +++ Commuality	eNurse eDoctor eSenior Advice eLawyer - User experience +++ Individualised +++ Availability +++ Content +++ Versatility +++ Access to support and assistance	Virtual health centre
Elderly people (service houses)	CaringTV: ++ Assistance from staff members	Contents ++ Exercise ++ Music + +Programmes of local parish		
Elderly people (clubs)	CaringTV: +++ Easy to use +++Peer usage	++ Content +++ Interaction +++ Independent		Peer production Commuality Responsibility
Family connection	Mobile: +++ Ease of use -- Sound	Contents +++ Exercise +++ Music +++ Quizzes	+++ Conversation with a loved one +++ With family and grandchildren	Online contact with professionals eShop ePharmacy eHome Care
Disabled people	Touch screen: +++ Customised buttons	Contents Hobbies +++ Book recommendations +++ Dedicated programmes for young people + Sexuality Sensitive topics - Own family	+++ eDiscussion +++ ePhysiotherapist	Virtual contact with a loved one and professionals
Young people	CaringTV: Interactive programming	+++ Flexibility +++ Speed + Technology	+++ eLibrary	Programmes produced by the young people Programmes produced with therapists and between units
Young people	Mobile: Contact between the young person and the social worker	Contents +++ Exercise +++ Virtual city tour +++ First aid	+++ Remote contact with social worker	Virtual contact with friends, school and family
Mental health rehabilitation patients	Touch screen		ePhysiotherapist	Virtual contact with a relative and professionals
- negative		+ satisfactory	++ good	+++ excellent

5.2 Customer Survey Results

Evaluations from the elderly participants (N=52) of the Safe Home projects were collected by a questionnaire. The survey was conducted in late 2010 and in spring 2011. The evaluation survey was carried out with the elderly clients in conjunction with the final interviews. The questionnaire was based on the form developed previously for the Kotiin project (Puoskari 2008.) Clients from both the Ehyenä and the Omana subproject were surveyed. The questionnaire included the client's background information (age, gender, form of living, education, closest person), and the effects of CaringTV, the technology and its use. The respondents included service house residents, day centre group members, and elderly people living at home.

56.9% of respondents were women and 43.1% were men. The average age of respondents was 78.2 years. 21.2% of respondents lived in service houses, 78.8% lived in their own homes (detached, terraced, apartment block). 30% of the elderly respondents said that their closest person was their spouse, and 60% said that a child was their closest person. 53.1% of the respondents had completed elementary school, middle school or comprehensive school. 22.4 % had a degree in higher education, and 12.2% had a vocational qualification (n=49). 25.5% of respondents use CaringTV daily, 55.3% weekly, 12.8% monthly, and 6.4% used it less often (n=47) (Table 9).

Table 9. Use of CaringTV

I have used CaringTV		
	n	%
Daily	12	25.5
Weekly	26	55.3
Monthly	6	12.8
Less often	3	6.4
Total	47	100.0

The respondents were asked about the effects CaringTV has had in different areas of their lives. The response options were: completely agree, somewhat agree, don't know, somewhat disagree, completely disagree. The number of

statements was 20. In some cases, the "completely agree" and "somewhat agree" were merged in the result analysis stage.

According to 40.4% of respondents, CaringTV has promoted the safety of living at home (completely agree or somewhat agree). 42.6% chose the "don't know" option. 40% of respondents completely agreed and 20% somewhat agreed with the statement that CaringTV had reduced the feeling of loneliness (Table 10). In terms of making the respondents' daily lives more active, 26% completely agreed and 42.2% somewhat agreed. 62.8% had received help with health-related questions from CaringTV (completely agree or somewhat agree), and 69.8% had received information about nutrition.

Table 10. Feelings of loneliness

Has reduced the feelings of loneliness		
	n	%
Completely disagree	1	2.2
Don't know	13	28.9
Somewhat agree	9	20.0
Completely agree	18	40.0
Total	45	100,0

80% of respondents said that CaringTV had improved their mood (completely agree or somewhat agree) (Table 11). The broadcasting times had been completely or somewhat suitable for 53.5%. Nearly half of the respondents felt that the technology had been easy to use (48.9%) (completely agree or somewhat agree) 19.1% of respondents disagreed completely or somewhat.

Table 11. Effect of CaringTV on the mood

Has improved the mood		
	n	%
Somewhat disagree	3	6.7
Don't know	6	13.3
Somewhat agree	12	26.7
Completely agree	24	53.3
Total	45	100.0

71.1% of respondents had made new acquaintances via CaringTV, and 62.5% had used the equipment to talk to other people in addition to programme makers (completely agree or somewhat agree). 56.1% of respondents said that CaringTV made it easier for them to live at home.

86% felt that the programme presenters had been good, and 74.5% felt that the presenters were easy to see. 83.3% of respondents did not mind being seen by other people in their homes. Only 2.4% of respondents said that it bothered them. 85.7% of respondents would like to continue to have access to the programmes. Only 2.4% disagreed completely. (Table 12)

Table 12. Continued programme availability

I would like to continue to have access to the programmes		
	n	%
Completely disagree	1	2,4
Don't know	5	11,9
Somewhat agree	8	19,0
Completely agree	28	66,7
Total	42	100,0

9.8% felt that the touch screen was difficult to use, while 46.3% disagreed with the statement. 43.9 % chose the "don't know" option. Guidance and advice

about CaringTV had been adequate according to 68.3% of respondents; 7.3% disagreed somewhat. 26.8% felt that it was difficult to follow the instructions.

In summary, the elderly respondents were nearly 80 years of age, half of them used CaringTV weekly, and one in three used it daily. The equipment had been easy to use and advice had been adequate. CaringTV had reduced the feeling of loneliness; it had improved the mood and made daily lives more active. Some respondents had received help in health-related and nutritional questions. Nearly all elderly respondents would like to continue using CaringTV and taking part in programmes.

The survey results of the Safe Home project are partly similar to those of the previous KOTIIN project on CaringTV. Daily or weekly use of CaringTV among clients was clearly higher in the spring 2011 survey compared to the survey conducted in the previous KOTIIN project, which indicated daily use by 30% and weekly use by 37% in spring 2008. The clients' willingness to continue participating in CaringTV was higher than in the previous survey.

5.3 Assessment of eServices

The Advisory Committee on Information Management in Public Administration issued recommendations on the use of videoconferencing technology in 2008. The recommendation covers topics such as different types of access to services, client meetings in social welfare services, and various meeting practices. According to the recommendation, the use of videoconferencing and other e-services supports the objective of bringing public services as close to citizens and clients as possible regardless of their geographical location. The sufficient coverage and high quality of communications networks is a prerequisite for broader user of videoconferencing and other teleservices. Teleservices complement other public service channels, such as face-to-face service, telephone service, and various electronic service channels. Videoconferencing can save both time and costs. A major argument for the use of videoconferencing is the environmental benefit of reduced travel. (The Advisory Committee on Information Management in Public Administration 2008.)

Teleconsultations based on video calls have been trialled and in some cases deployed in many places in Finland, including in radiological, neurological and dental consultations, especially in situations where distances are great. According to a report by Windblad et al. (2008), the primary form of

teleconsultations using videocalls involves a setup where the doctor has one device and the other one is used by a healthcare professional and the client. According to the report, teleconsultations involving direct contact between a healthcare professional and a client have not been used in Finland. (Windblad 2008.)

According to research, telehealth technologies can improve the quality of care and the performance of the care process. The availability of services and the competence of staff also improve, and travel costs are reduced. There are many factors related to technology, staff and social systems that need to be considered in the deployment of teleconsultations. (Vuononvirta et al. 2009.)

New practices require open and enthusiastic approaches to new work methods and tools from clients and experts alike. While virtual contact can never replace the actual, it does provide a good and needed addition to other ways of communication and contact, both in terms of time saving and cost-efficiency.

5.3.1 eConsultations

Welfare technologies promote the welfare of clients while also allowing for and marketing the attractiveness of the welfare sector as a future employer (e.g. An, Hayman, Panniers, Carty 2007). The concept of telemedicine is now used as a basis for the development of electronic and digital services. Telemedicine refers to exchanges and transfers of care and health data from place to place using electronic transmission methods. Experts can monitor and respond to changes in patients' states of health without the patients having to visit a doctor's surgery (Koiranen 2006). With electronic data transfer systems, the health and wellbeing of patients can be monitored at any time and from any place. eHealth (electronic health) refers to the digital transfer, storage and reuse of health care data in electronic format. It enables both experts and clients to have remote access and online contact. According to Koiranen (2006), eHealth covers all aspects of combining health care with information technology. eHealth can be divided into three areas: systems related to patient care provided by health care professionals, including hospital and health centre systems and systems related to home care; systems intended for teaching and for disseminating health-related information and knowledge, which can be used for consultations, education and information, and systems designed for the sale of health-related products. (Koiranen 2006).

The first eHealth services were implemented for health care professionals and decision-makers. Currently the trend is increasingly directed at health care clients, to support self-care or the monitoring of health or illness. (Koiranen 2006). Telehealth differs from telemedicine in that it provides assistance and support to people who are far away from health care services. They may not necessarily be ill but just wish to maintain or improve their wellbeing and healthy lifestyles. Telehealth was designed particularly for monitoring health care in the home environment.

Digital data and webs allow for networking, which makes it possible to combine different services with the client in mind. This client-oriented process is made easier thanks to the availability, ease of use and speed of information. However, turning information into people's wellbeing and activities requires access to diverse support and consulting services, regardless of time or place. As the welfare sector becomes virtualised, ethical questions grow in significance and require systematic research. The use of information technology places new requirements on staff and experts, related for instance to skills in using IT to help clients, to update their own knowledge and to promote the wellbeing of the population.

The purpose of this study was to produce new virtual solutions for eWellbeing services that can be directly translated into operating models to support the independent living of the client groups in question. For example, the client's wellbeing and health can be monitored using the remote monitors and wireless safety circuits tested in the project.

eNurse and eDoctor

Virtual eNurse and eDoctor clinics were implemented as part of the Ehyenä subproject of Safe Home. eNurse clinics were provided once a week, and eDoctor clinics were provided once a month. The eClinics were provided at agreed times via video connection on CaringTV to elderly clients living at home. The connection is a secure point-to-point connection which cannot be accessed by others at the same time, which protects ethical and confidential conversations.

Three clients had the CaringTV unit and remote health monitors at home. The clients took readings of blood pressure and weight independently and evaluated their overall wellbeing using the pain/wellbeing scale. The blood pressure and weight readings were transferred wirelessly via the server to the CaringTV Clinic

monitor application using the Bluetooth connection of the monitoring devices and the client's mobile phone. Clients were able to view their personal readings from CaringTV Clinic monitor where they could manually input their own assessments using a pain/wellbeing scale. The eNurse and eDoctor were able to view the results of the eClinic clients from their own computers using personal login details. For example, during the eClinic, the client can show the doctor a skin condition or sore by using the moving camera. The doctor can then examine the problem on the screen. The video connection can also be used for showing documents, medicine bottles, etc.

The eNurse clinic was aimed at providing guidance and support to elderly people living at home to maintain their health and wellbeing. The elderly were able to contact the eNurse using the CaringTV touch screen at agreed times once a week. The eClinic was based on interaction. Clients took personal responsibility for their own health and wellbeing. The discussions were always voluntary and based on the client's own initiative.



Figure 4. eNurse clinic

The following are some of the topics discussed at eNurse clinics:

- the client's overall wellbeing
- daily activities
- social relations
- feelings, concerns and worries
- remote monitoring results.

The clients took blood pressure and weight readings independently at home and evaluated their overall wellbeing using a pain/wellbeing scale. The data was transferred wirelessly to the CaringTV service platform where the results could be viewed by the eNurse and eDoctor. The eNurse pilot programme started in spring 2010. In 2010, a total of 78 eNurse clinics and 38 eDoctor clinics were provided to seven clients. The collected data indicates that the virtual clinics were a natural part of the participants' everyday activities and that they became active in monitoring and maintaining their personal health. As technological solutions, both the CaringTV touch screen and the remote monitoring devices were user-friendly and well suited for remote monitoring purposes to improve the safety of elderly people in their home environments.

The Clinic monitor interface enables data to be transferred and logged by experts during the eClinic. The doctor and the nurse were in contact via the Clinic monitor interface where they could leave messages and read each other's notes. The interface also provided the option to send text message reminders to clients about appointment times etc. In this project, no client database was maintained, and the clients' health history was not provided. The doctor and the nurse had access to information and medical histories provided by the clients themselves. The duty of care was not at any point transferred to the project; the client's regular doctor continued to be responsible for the total care, medicines and other issues related to the patient's health.

The experiences from both the eDoctor and the eNurse clinics were encouraging with regard to future development. Virtual contact provided genuine interaction in spite of geographical distance. Clients were able to carry out certain tasks from their own homes, and the expert was able to see more clients than in a conventional clinic setting. Although the virtual clinic cannot completely replace visits to the doctor or nurse, the eClinic nevertheless provides efficiency and versatility benefits to certain types of medical examinations and assessment visits both from the service providers' and the clients' point of view.

During the Safe Home project, eNurse consultations were also tested between members of service house staff. The nurse of a service house provided regular weekly consultations to the staff of another service house when the resident nurse of that home was not present. Practical nurses received direct advice on issues related to clients. The video connection made the consultation a richer experience compared to a telephone call: the nurse had access to visual information, and clients could be involved in the consultation.

From the research point of view, the evaluation data describes the guidance, counselling and new information provided by the eNurse to practical nurses working in service houses in matters related to the health and overall wellbeing of elderly clients. The content of teleconsultations focused on the health, everyday coping, mental health and physical symptoms of elderly clients. The eNurse provided regular consultations to support the care staff in helping an anxious resident, who was aggressive and occasionally had no will to live, to continue living in the service house. Providing support to the staff members themselves was also important. A confidential relationship between the eNurse and other care staff is important to their ability to help the client. The eNurse's evaluation also highlights the virtual consultations with the doctor, contact with relatives, and up-to-date knowledge and competence. The challenges of virtual consultation include electronic documentation, the compatibility of data systems, and the monitoring of readings and measurements sent remotely. The eNurse's evaluation clearly emphasised content, the care relationship and safety. The content of virtual consultations was based on the client's circumstances, expectations, questions and problems. All individuals who participated in eNurse or eDoctor consultations were very satisfied with the discussions and the in-depth examination and interaction that took place during eConsultations. (Figure 17)

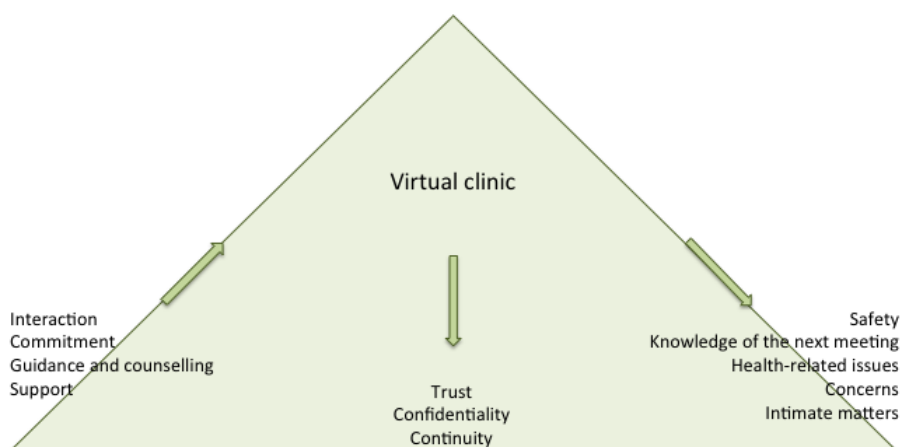


Figure 17. eNurse consultation

Based on the evaluation data from the eNurse consultations, the following recommendations can be made with regard to virtual consultations. (Figure 18).

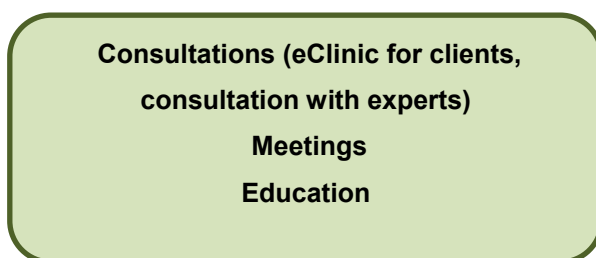


Figure 18. eClinic recommendations

The e24h Service was another service piloted during the Safe Home project. For a limited time, clients had 24/7 access to care staff via an eService on CaringTV. Clients could open a direct video connection to the service provider by pushing a single button on the touch screen. The trial had to be terminated in autumn 2010 when the business ran into financial difficulties. The experience was nevertheless useful, especially from the client's point of view. Help was always at hand if clients had any concerns. This kind of service could help elderly people living on their own by providing easier contact. It could reduce the number of visits to regular clinics with regard to problems that can be assessed and advice given in a virtual setting.

Elderly people living in their own homes saw the e24h service as an important new way of supporting independent living. According to the participants, the knowledge of being able to access help any time of the day increased their sense of security. In terms of content, the e24h service was regarded as professional and trustworthy. One elderly person described the e24h service as follows:

"I wouldn't have coped with last summer's hot weather without this CaringTV and access to help. I was often restless and called the nurse via the touch screen to ask for help..."

The project has provided useful experiences about different types of consultation both from the clients' and the experts' point of view. In Finland, these types of consultations have been trialled primarily between experts. (Vuononvirta et al. 2009). Fewer trials have been conducted in situations where the client receives services or consultation directly at home. On one hand, this poses challenges related to the consultation setting in terms of issues such as equipment compatibility and usability, while on the other hand, it could facilitate the provision of fast, cost-efficient and client-friendly services directly to clients' homes.

The evaluations of the elderly clients particularly emphasise the meaning of eClinics. According to the users, a sound confidential relationship with the eNurse and the eDoctor is a prerequisite. Continuity and knowledge of the next eClinic promoted the sense of security and the elder's integrity and emotional resources. The participants considered it particularly important that the experts concentrate intensively and engage with the situation and the client's issues. The participants were also able to discuss intimate and sensitive issues via the video connection. A significant aspect of the eClinic is that when the elders prepare for the consultation ahead, it provides meaning to their day and energises them. In the case of one participant, the relative also appreciated and emphasised the usefulness and meaning of the eNurse and eDoctor consultations for the parent's coping and ability to live independently.

As the population ages and the number of clients in elderly services rises, different types of eServices and eClinics are the future. One way to respond to this challenge is to develop technologies that allow for caring for greater numbers of clients. From the client's point of view, ease of use and user-friendliness are the key to making new services and operating models a part of everyday lives. On the other hand, cost-efficiency and improved availability of services is important in order for municipalities to be able to respond to these

challenges in the future. However, making changes to service structures and practices is not a fast process. The operators must reform their thought models and practices, and all parties must accept the idea that technology brings benefits. Different types of operating models and practices must be tested without prejudice in order to create something new. However, development cannot be led by technology; instead, everyone should consider how technology could help and facilitate their own work with clients.

Case: virtual contact as a support for an elderly person in home care

An experiment on providing virtual support to a home care client began in March 2011 as part of the Safe Home project. The objective was to determine the possibilities and suitability of welfare technologies - in this case, interactive CaringTV - for communication between a home care client and the experts. The idea was to replace conventional home visits with virtual visits and to provide night-time support to a demanding home care client by a night nurse of a service house. Due to these objectives, the duty of care had to be shared in a completely new way between different operators from the beginning of the trial.

A 61-year-old male who lived on his own and needed a lot of help and support from home care was chosen for the trial. The man had few social contacts. He had several long-term illnesses which meant that he spent a lot of time at home on his own. Before the trial, the man had often sought help for his pains from the Emergency unit. The client consumed large amounts of alcohol frequently, and he was affected by a lack of company and stimulation. The home care services had known the client for a long time, and he had been supported with conventional home visits, which had become more frequent over time. In addition, the client had started to visit the local day activities for the elderly once a week. There had been a previous attempt to find him a place in a service house due to his inability to cope independently. The easy-to-use CaringTV touch screen unit was installed for the client in March 2011. The client was now able to participate in interactive CaringTV programmes twice a day. The client began to participate in the programmes as soon as the equipment was installed, and he quickly became a part of the CaringTV community with other elders.

One home care team, which consisted of a supervisor and seven workers, took part in the project. The team is responsible for approximately 50 clients in a large geographical area with long distances. A mobile version of CaringTV was installed on one of the team's workstations in March 2011. The carer who was in charge of the client in question was among the first who trained to use

CaringTV. Other members of the home care team learnt to use the equipment under this person's guidance. The carers had access to a real-time virtual video connection with the client from the office of the home care service. The client was also able to open the video connection with the office if required. After a short trial period, it was decided that one afternoon visit by the home care team could be replaced with a virtual visit, and this started in mid-May 2011.

Since April 2011, the home care client has had night-time support from the night nurses of a service house located in a different region each night at around 10 PM. The night nurse contacts the client, asks him about his day and wishes him good night. The purpose is to promote the client's sense of security when he is at home. During these contacts, the nurse and the client discuss his health, and the client gets instructions related to self-care. If necessary, the client is also able to contact the night nurse during the night. The night staff of the service house log the nightly events in the home care programme of the client database, where the home care worker can then read them in the morning.

The trial has succeeded well both from the client's and the experts' point of view. Based on the evaluation data, the client has been very enthusiastic and interested in participating in CaringTV programmes. He has made new acquaintances and often stays to continue discussion with other participants after programmes. According to the experts' assessments, the client is more active and upbeat, and he has clearly cut down on his alcohol consumption. The fact that he had made hardly any visits to the Emergency unit in the previous month was significant.

The home care experts have been enthusiastic about their participation in the trial. They have suggested new ideas about continuing the trial and about wider deployment of welfare technologies. The experts' views about the use of welfare technologies in home care have been future-orientated. For example, a home care nurse can use the virtual video connection to consult a doctor or to quickly contact other professionals providing services to the client, such as social workers. The experts have also discussed and made plans for a centralised online service to support elderly home care clients. In the future, the client's social network, such as contact with relatives, could be supported via the video connection.



Figure 5. Video connection provided via CaringTV

ePhysiotherapist

The ePhysiotherapist services were piloted in the Safe Home project both as one-to-one and group consultations. The clients were able to participate from their own homes or as part of a group in service houses. The programmes had specific themes which were discussed and instructions were given. In addition, the clients had access to personal virtual consultations with the physiotherapist. This service was used by a number of elders and one disabled client.

The challenge of this service is the lack of physical contact and the difficulty of examination. This has been recognised in earlier trials and studies on virtual physiotherapy using videoconferencing or other video technologies (e.g. Kairy et al. 2009). On the other hand, similar physical and functional objectives have been achieved in studies compared with conventional physiotherapy sessions (Russell et al. 2003, Russell 2004).

The project evaluations - especially the experts' evaluations - highlighted the need for development in the operation and content of ePhysiotherapist consultations. If this succeeds, consultations could be provided virtually with focus on one specific topic. After a one-to-one consultation, the client could continue exercising independently. ePhysiotherapist consultations could

continue in small groups, where the agreed topics could be discussed further, and the self-directed exercises could be reviewed.

Another challenge involves carrying out mobility tests and measurements in a virtual setting. A physical meeting is needed first in order to carry out the necessary tests. That could be followed by a virtual, progressive exercise and guidance programme, first alone and then in small groups using the video connection.

According to previous studies, telerehabilitation can help to improve the clients' physical, functional, and psychosocial abilities. Rehabilitation results have been as good as those from conventional face-to-face therapy, and client satisfaction in telerehabilitation has been high (Russell 2009, Kairy et al. 2009). Both the clients and the therapists have been satisfied with telerehabilitation. (Russell et al. 2009.) Clients have found telerehabilitation useful and even easier compared to attending a clinic (Hoening et al. 2006). What is important is that the operating model is well planned in advance and that the eConsultations are directed at clients who can benefit from them. If the client has physical, cognitive or speech-related problems, organising rehabilitation via a video connection may be difficult. (Theodoros & Russell 2008.)

Based on the project's experiences, the video connection can be used to support the client's coping and functional ability. Some clients will need support from an assistant to facilitate communication or for other reasons. The consultations cannot be occasional: the physiotherapy programme must be well planned and systematically progressive in order to achieve results in improving the client's functional ability.

5.3.2 ePharmacy services

Jaana Ylitalo

As the Finnish population ages, age-related illnesses become more common and the use of medicines increases. In 2001, the total cost of drugs subsidised by Kela (Social Insurance Institution of Finland) was €1.218 billion. 39% of the costs were for the over 65s, even though this age group represents only 15% of the population. Medicine costs have increased significantly since the baby boomers have started retiring. Based on previous years, it is estimated that a 1% increase in the size of the elderly population results in a 2.6% increase in the costs of medical care. (Kaitsaari 2007.)

Key issues of elderly medical care are comorbidity, high volumes of medicines, elderly patients' difficulty to understand dosage instructions, and the potentially minimal - even harmful - effect of indicated medication. Problems related to medical care increase as the patient gets older and the body undergoes changes which can influence the effect of medicines. For that reason, elderly people are more prone to adverse reactions than the middle-aged. (Kaitsaari 2007.) The provision of appropriate medical care is the most important task of pharmacies. Professional guidance and advice is as important as providing the medicine. Especially in the case of prescription clients, the pharmacy continues the information process started by the doctor.

A thesis completed as part of the Safe Home project examined the current state of pharmacy services and the possibilities of using virtual technologies as part of eWellbeing services. The thesis was based on process descriptions drawn up for conventional pharmacy services and ePharmacy services to facilitate parallel comparison of the effectiveness and quality of each service model.

In the conventional pharmacy service model, the service takes place in physical pharmacy premises during personal visits by clients unless they are unable to visit in person. At the pharmacy, clients are given advice on the use of the purchased medicines and the staff aim to establish whether the client needs other products. The client's details are entered in a database to provide information about side effects and other issues. If the client is unable to visit the pharmacy in person, the visit is usually made by a home care worker or a relative. When the pharmacy visit is made by home care services, the product order and the related information and prescriptions can be sent to the pharmacy in advance, in which case the worker can collect the medicines packaged and ready for collection. If collection has not been agreed in advance with the pharmacy, the service process is the same as with other clients: prescription medicines are collected from the prescriptions desk, and non-prescription products are collected from the shelf locations. The process is the same for pharmacy visits made by relatives. (Ylitalo & Backlund 2010.)

Examination of the processes revealed that when the pharmacy visit is made by a home care worker or relative, the service cannot be provided to the same standard as when the pharmacy has direct contact with the client. The main reason for the reduced quality of service is that without direct interaction, pharmacists are unable to provide a sufficient level of guidance and advice about safe use of medicines to the client. On the other hand, the pharmacy staff are also unable to determine the client's other needs for non-prescription products, if direct interaction is not possible. The study also found that home

care clients have an equal right to choose their preferred pharmacy as the clients who visit the pharmacy in person. However, in practice, the choice of pharmacy is often determined by the location of the home care unit or a contract between the local authority and the pharmacy. Some municipal home care services use multiple pharmacies for collecting clients' medicines. If prescription and non-prescription products for the same client are ordered and collected from different pharmacies, it can pose risks such as insufficient consideration of the combined effects of different medicines. (Ylitalo & Backlund 2010.)

Group programmes produced by pharmacists were piloted in 2010 and 2011 as part of the Safe Home project. The programmes were directed at elderly users of CaringTV in SouthWest Finland and Uusimaa. The programmes were based on predetermined topics. Clients were also given the opportunity to suggest topics. During the programme, the pharmacist provided professional information about the subject. The clients had the opportunity to ask questions and discuss the topic. The programmes were popular and well regarded among the regular elderly clients. The clients had active interaction with the pharmacists during the programmes. The guidance and advice sessions, which lasted 45-60 minutes, provided clients with new, clear information about the safe use of medicines in their daily lives. (Ylitalo & Backlund 2010.)

The ePharmacy service included the delivery of prescription medicines and non-prescription products, pharmacy support service, and group and one-to-one advice. The use of virtual technologies in services directed to the elderly caused some clear difference in opinion between the elderly and the representatives of home care services. Elders who were previously unfamiliar with virtual solutions were interested in using the service as their physical health deteriorated. The elders felt that using the equipment and the service would be easy for them even without previous technical knowledge. The elders who tested the CaringTV service concept also found the service easy to use and personally useful. However, in their responses, the representatives of home care services implied that virtual technologies are not suitable for the care of the current elderly population due to their weak technical abilities. This suggests that people working in eldercare need more information about the usability of existing virtual technologies and about the experiences of clients who have tested the solutions. (Ylitalo & Backlund 2010.)

It was noted that the implementation of ePharmacy services requires that virtual technologies be adopted by municipalities in their standard range of assisting devices. ePharmacy service would then be one service among many virtual content-based services. Contrary to what is presumed by the representatives of

municipal eldercare, elderly people have a very positive attitude to the use of virtual services. The clients who tested CaringTV noted that the service had provided a highly useful "lifeline". In addition to the psychosocial effects, the use of technology in services would also improve the quality of service to clients with limited access, provided that the service is developed with a userdriven approach from start to finish. (Ylitalo & Backlund 2010.)

5.3.3 *Virtual contact: new tool for social work with young people*

One of the objectives of the Safe Home project was to develop new work forms for social and health care using videoconferencing via CaringTV. Examples of this include the eNurse consultation and the virtual contact between a young client and the social worker, both of which are described below.

Municipalities have a legal duty to provide after-care to children or young people who are clients of child welfare services after they come out of foster care. The duty to provide after-care ceases by the time the person reaches the age of 21. (Section 75 of the child welfare act 2007 (*lastensuojelulaki*).) After-care is provided to support a child or young person who has been in foster care, the person's parents and guardians, and the person providing the foster care (Lastensuojelun käsikirja (handbook for child welfare services). After-care services are voluntary to the client. Virtual contact between social workers and young clients began in autumn 2009 at the youth welfare/after-care unit of the family and social services of the City of Espoo.

Some welfare meetings can be organised via videoconferencing, which saves travel time for social workers and gives more time to handle the client's matters. Furthermore, videoconferences can be arranged at a short notice, as travel times do not need to be taken into account in schedules. (The Advisory Committee on Information Management in Public Administration 2008.)

After-care clients live in different parts of the country either independently or in institutional facilities. In this case, the City of Espoo provides after-care regardless of the person's domicile. Social workers meet the clients regularly either in the client's home town or at the social service offices in Espoo. Telephone contact can also be used if necessary. Virtual contact facilitates more frequent meetings, less travel, and better engagement in the young person's life.

The after-care social workers in Espoo (N=5) had CaringTV software installed on their computer which enabled them to have contact with young people living

outside Espoo (N=6) by using a small camera and a microphone. The same software was installed on the young person's laptop. Meeting times were agreed upon in advance.

Both the young people and the experts considered the experiment successful and an even surprisingly encouraging experience. Trust and openness between the young person and the expert is a prerequisite for communication. The evaluations highlighted the intensity and situational sensitivity of communications. On the other hand, the vulnerability of the technology hindered communications from time to time, as did the older computer type used by the young person. The following recommendations have been drawn up based on the collected data (Figure 19).

Virtual guidance and counselling (eClinic, eMonitoring)
Consultations (e.g. medical care, psychiatry)
Contact with the young person's network (e.g. school)
Contact with the family
Programme production with young people from different units

Figure 19. Virtual contact - recommendations

Case:

"Maiju" (not her real name) is a young woman and a client of Espoo after-care service. Encouraged by her social worker, she took part in the Safe Home project to test the new communication model using video connection. Maiju lives and works in a town approximately 250 kilometres from Espoo. Maiju lives independently. Before she got involved in the project, she had stayed in touch with her social worker mainly via telephone and in a few meetings held at the Espoo office and in Maiju's home town.

The situation changed when the Vidyo software - the operating system for CaringTV - was downloaded onto Maiju's personal computer. Using the secure real-time video connection provided by the software, Maiju began to have contact and manage her affairs with the social worker, who was using the office computer in Espoo. The long geographical distance became insignificant, and the video connection created a sense that matters were discussed "around the same table". Thanks to the video connection, Maiju could show her documents

to the social worker, who was then able to approve her expenses and submit them for payment. This saved Maiju the hassle of sending the receipts by post and made the processing quicker. Another benefit of the video connection was that contact became more frequent compared to the old method. Discussions lasted longer than phone calls previously. Maiju and the social worker got to know each other better through these meetings. The social services' duties came to an end when Maiju turned 21 and left care. This also ended her participation in the project, but it gave her good experiences about the benefits of videoconferencing.

The following is Maiju's comment about the benefits of her participation.

"I have been very happy with the programme of the Safe Home project. It has worked very well for me, and there have been no problems. Thank you for letting me take part, it makes it easier for me to take care of my affairs when I don't have to go all the way to Espoo to attend meetings"

5.3.4 Examples of eService process descriptions

Process descriptions are practical steps that provide a systematic view of an operation. They are especially important in quality work and in operational development. A process is based on the idea that there is something permanent that can be repeated, agreed upon, and modelled and developed. Process orientation usually supports client orientation. Processes are analysed and described by identifying the actions, contents and factors of one process at a time. The basis is client processes and improving their performance and flexibility (Lillrank & Parvinen 2004, Laamanen 2009).

Lillrank et al. (2004) define the process as follows: "A process refers to a series of actions designed and implemented by a production organisation, and the control procedures and information flows that link the actions together. Processes can describe designs, plans, protocols, the grouping of resources, and operating criteria." Processes are created and described so that similar actions could be carried out in the same way every time (Lillrank et al. 2004).

A process description is usually a part of a broader concept. Processes are divided into core processes and supporting processes. The core process produces the primary value of the activity. Supporting processes produce various output components for the core process and thus enable and support

the core process. Identification and description of processes facilitates development of the work process or activity. (Lillrank et al.2004). After the process has been described, it is possible to systematically evaluate, develop and improve the activity. A process description can also help to identify critical stages of the activity (Laamanen 2009).

The purpose of process descriptions is to analyse, identify and model the main activities and critical activities, and their interdependencies and roles. The process description provides a model of the actions and responsibilities of different operators in different stages of the process. Responsibility refers to justified and purposeful action and activity (Laamanen 2009). In terms of content, processes are normally described for similar groups. The aim is to describe processes for a specific client group, which means that they cannot be transferred or applied to a different type of client group in a meaningful way. It is important and essential that the client group be selected carefully. (Lillrank et al. 2004.) The process description can focus on current operations or on the desired development outcome.

Two eWellbeing services and their process descriptions are presented below. The processes of the eNurse clinic for home care clients and the child welfare/after-care eSocial Worker were chosen as the subjects for modelling. Both in the eNurse and the eSocial Worker, the new form of virtual consultation was based on userdriven ideas.

The process descriptions were drawn up on the basis of collected data which included interviews with two nurses and four social workers. All had experience from giving virtual consultations and from related management tasks during the project. In terms of content, the process descriptions were based on genuine real-life activities.

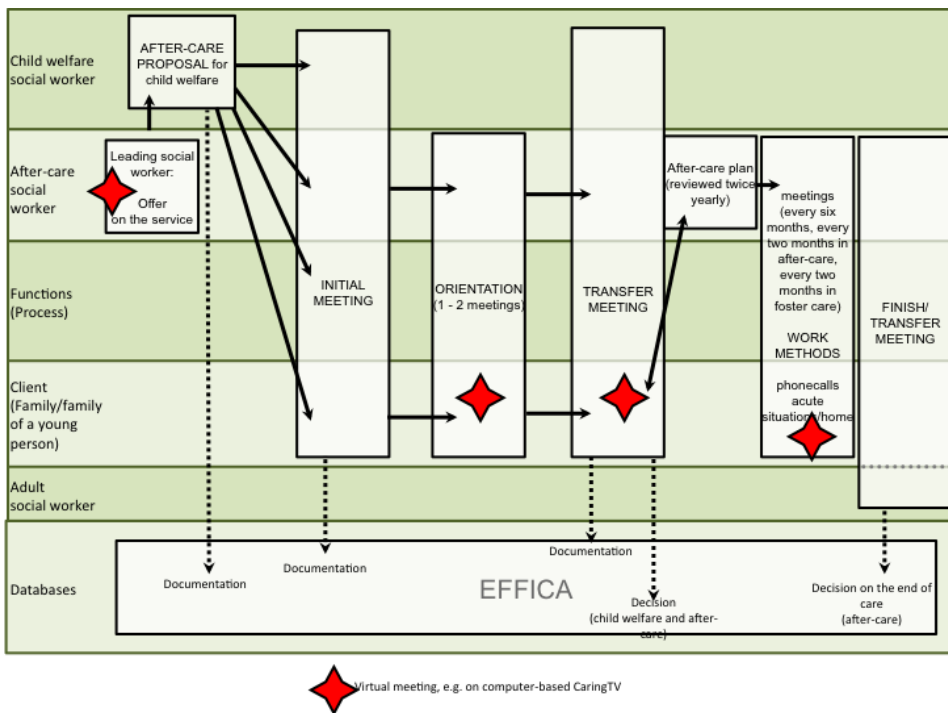


Figure 20. Process description for eNurse as part of home care

The costs were based on the price list of the City of Espoo Social and Health Care Services as of 1 April 2010. (Director, Social Service and Health Department, Financial Administration, 14 April 2010 § 14).

Although the cost examples are based on a single client case, significant savings can be identified in working hours and costs when using virtual contact.

Table 13. Example calculation of home care costs

Example costs Home care: Client case	Costs	Existing practice *	Virtual home care visit E.g. computer-based CaringTV **	Savings
Working hours	Client hour €92.79 / h	Home visit 30min/visit x 3/day = 90 min/day 90 min x 4 x 4 = 24 h/mth	Virtual consultation: 15min/consultation = 15 min/day 15min x 4 x 4= 4h /mth = €371.16	
Home care visits / month / worker	-	24 h x €92.79 = €2,226.96	Home care visit 30 min/visit x 2/day = 60 min /day 60 min x 4 x 4 =16 h /mth = €1,484.64	Working time savings 4h/mth
Travel	Included in the client working hours	Travel costs: The client lives close to the home care office	-	
Emergency unit/Health centre visit	Visit to the doctor / Emergency unit €132.41	E.g. Emergency unit/Health centre visit 4 x/mth 4 x 132.41 = €529.64	-	
Equipment costs	Software: €49/mth Touch screen: €149/mth	-	1 x software 1 x touch screen	
Total costs/ mth		€2,226.96 + €529.64 = €2,756.60	€371.16 +€1,484.64 + €49 + €149 (software) = €2,053.80	Savings: €702.80 /mth
* Home care visits: three times a day on four days a week ** 1 home visit per day replaced with a virtual visit				

eContact between a young person and a social worker was modelled as a process description and costs were calculated using genuine client cases. The process description, and particularly the cost calculation, show significant savings in costs based on a single worker and journey, compared with the current practice. The cost savings could be used to purchase more equipment to partially replace the existing practices, for example in communications between young people and social workers. The same equipment could be used for

internal meetings, negotiations and training events. eConsultations and contact with other parties of the client's support network could also be implemented virtually. The services needed by the client - in this case, a young person and her family - could be made more efficient and flexible, and their availability and quality could also be improved by using new virtual work forms.

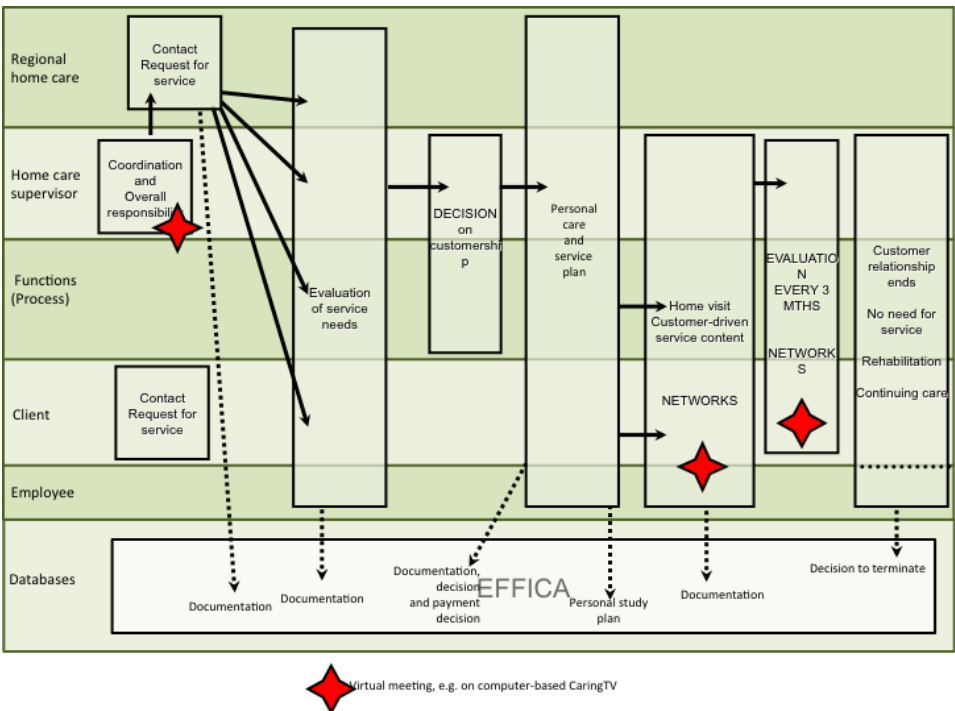


Figure 21. Child welfare process

Table 14. Example calculation of child welfare costs

Example costs: After-care	Costs	Existing practice	Virtual e.g. computer- based CaringTV	
Working hours	hourly pay: €95.14 (soc. work) €108.82 (mgmt) software (€49/mth)	12.5 h includes the meeting: 1-1.5h	0.5-1 h	
Travel	€300 + €100 (rental car) = €400	e.g. trip to Joensuu departure 7 AM return 7.30 PM flight cost: €300 rental car: €100	-	
Subsistence	€36	1	-	
Overtime	hourly pay: €95.14 (soc. work) €108.82 (mgmt)	> 1 h	0	
Trips/ year/ employee		approx. 10 trips	approx. 10 times	
Total costs/ trip		€1,189.25 + €400 + €36 = €1,625.25	€95.14 + €2.33 * 2 (software/day) = €99.80	Cost savings: €1,525.45

5.4 Usability Study Outcomes: Assessment of Telecare System

Päivi Saalasto & Jaana Ylitalo

The usability study is an integral part of the development process of welfare technologies. Usability is a quality that applies to all products. Usability is the user's subjective experience of using the product and how successful it is, and it is always situation-specific. (Riikonen 2006.) According to Wille Kuutti (2007), usability as a product characteristic describes how well the user can use the functions of the product in order to achieve the objective.

Usability is one area of the user experience. The user experience is the user's overall idea of the system. In general terms, there is a correlation between the user experience and usability: the better usability a system has, the better the

user experience. (Ministry of Finance, 2008). When designing welfare technologies, it is necessary to ensure that technological solutions meet the usability criteria, which include the social, functional and emotional dimensions. One of the findings of the ELDER project carried out in the United States in 2000 was that even if end users find a technological solution useful, they will not use it if they don't like it. (Hirsch et al. 2000.)

The design of welfare technologies is based on the userdriven approach where the designers and end-users are in active dialogue throughout the process. To this end, welfare technologies are often developed in a LivingLab research infrastructure. LivingLab is a genuine, real-life environment harnessed for innovation activity. (Rönkä & Orava 2007.) At the core of the LivingLab environment is the end user of the welfare technology and services in a genuine user environment. In user study, the focus is on systematically increasing the end user's personal experience and the user's participation in the product development process (e.g. Hyysalo 2006). The experience-based data collected in a user study provides information about the user experience and the characteristics of the product or service as seen by the end user or group, and the user's wishes and needs related to the product or service. These can be used in the design and development of the concept, interface and service structure, contents and visual appearance. (Ministry of Finance 2008, Hyysalo 2006).

The evaluation research process included the evaluation of the technology as perceived by the end-user. The technology aspect emphasises the comparison and integrability of technologies. For example, a user group consisting of elderly people has special requirements with regard to the usability and accessibility of equipment. These requirements also apply to the interfaces piloted in the Safe Home project, i.e. CaringTV® and the telecare interfaces. In this service concept, the main objective is a high satisfaction rate among users with regard to the use of the equipment and the interaction possibilities of the service provided by the equipment. Usability comprises the learnability, accuracy, memorability, efficiency and comfort of use. (Sinkkonen, Kuoppala, Parkkinen & Vastamäki 2002.) In practice, this includes factors such as how fast the user learns to use the equipment and feels that he or she understands how the equipment works. The operating logic must be simple and allow errors. (Saalasto 2009.)

Accessibility poses challenges with regard to interface design: the physical appearance and workings of user equipment must be designed for use by people with poor vision and varying degrees of mobility issues and cognitive

problems (e.g. poor memory). (Nielsen 2000.) The availability of hardware and software used in the solution is also an indication of its reliability (errors do not prevent operation) and whether the service is available at all times. Availability and reliability are closely linked, which indicates the equipment's ability to provide the required functions without errors. The concept of reliability also includes the product life of the solution, i.e. how long it can be used before it becomes obsolete. Using the hardware and software on another level - for example in communications between elderly people and their relatives, or between young people - requires that the software is compatible with common PC systems and internet technologies. (Saalasto 2009.)

In addition to the usability described above, the developed technology also needs to be (financially) accessible. Accessibility includes the physical, psychological, social and financial accessibility of the product from the end user's point of view. In welfare technologies, this refers to the individual's ability, possibilities and willingness to utilise applications that support everyday life in a best possible way in different stages of personal functional ability. Financial accessibility refers to a person's financial ability to acquire and use welfare technologies. In legislative terms, homeowners are in an unequal position. (Turkka 2008.) In the Safe Home evaluation study, the technological aspect was considered alongside other approaches, such as the client/financial aspect. In this type of project, the functionality of technology has been examined using the usability research approach which takes into account the special needs of the different pilot focus groups of the project.

Case: Assessment of the telecare system

The ArctiCare telecare system is designed to support both social services and health care while providing safety and security in emergencies. The system is specifically aimed at promoting the welfare, coping, functional ability and independence of elderly people living in their own homes. In addition to the home environment, the system can be installed in a service house environment or other eldercare facility. (ArctiCare 2010.)

The ArctiCare telecare system is a comprehensive communications and alarm system consisting of a central unit and client devices. Multiple client devices can be connected to a single system. A videophone can be added to the ArctiCare system for communication between care personnel, elders and their relatives. A key feature of the system is the tracking feature for indoors and immediate surroundings, along with the automatic alarm functions which alert the care staff

about the emergency even if the elder is unable to activate the alarm personally. (ArctiCare 2010.)

The ArctiCare telecare system was piloted as part of the SouthWest Finland subproject in cooperation with the City of Laitila. The telecare system was used as a tool for home safety, rehabilitation and to reduce institutional care. Seven clients of the home care services of the City of Laitila took part in the testing of the telecare system during the Safe Home project.

As part of the evaluation study, usability tests for the telecare system were carried out in autumn 2010. Three clients of the home care services of the City of Laitila who had participated in the project also took part in the testing. Usability tests were carried out in clients' homes, which provided a test environment similar to a real life user environment. The main purpose of the usability test was to examine the users' mental models, which could provide solutions to improve the quality of the product's use during further development.

Thinking aloud was used as the method in usability testing. In this method, the test subjects explain what they are doing during the test. Thinking aloud as a test method helps to understand what kinds of ideas and misconceptions users have about the product. This means that the test not only reveals problems, but it can also expose the reasons behind them. (Riikonen 2006.) In the usability tests, the using process of the system was evaluated based on predetermined tasks. The tasks were related to the user experience of each test subject, and therefore depended on the client's personal needs as a user. The tests were documented on video, and the test facilitator made notes during the test. Based on the usability test, the test facilitator drew up a profile for each test person and identified usability problems in the system and other issues that required improvement or correction.

User A was a 94-year-old woman. Her purpose of using the telecare system was to enable a virtual medication check by home care once a day. The home care service contacted User A as part of the service. User A did not have any other contact or services via the telecare system. In the test situation, User A said that the device was unnecessary as the home help service visited the building in any case, and in her view they could visit her at the same time. In the beginning of the test, the user turned the power on from the socket unit (the user had been instructed not to disconnect the power). When the system started, an error message was displayed on the screen. The user did not know what to do with the error message. During the test situation, it became clear that the user was frustrated and she had not used the unit for a long time. The user said that she

trusted the home care staff to visit her, and that she saw the equipment as unnecessary use of electricity. Electricity consumption was also the reason why she had turned the power off. When the home care office called, the user hesitated for a long time about how to proceed. The user was not familiar with the system interface, and it confused and upset her. "Why is my picture not there?" (The picture was so small that the user could not see it.) After the video call, the user could not remember what she was supposed to do. The user did not respond to the assistant's instructions, and the test facilitator ended the call by pushing the symbol on the touch screen.

The profile of User A in the usability test:

- The appeal of the system: negative
- Attitude towards the system: anti
- Abilities and possibilities to use the system: no hindrances
- Safety: does not create a sense of security
- User activity: hesitant, non-routinised, gives up easily

User B was also a 94-year-old woman, who had used a virtual home care connection such as the one described. In addition to the home care connection, User B's telecare system included contacts with eight relatives; of these, the user was in daily contact with two relatives. During the test, it became apparent that the user had always received the incoming video calls, but she had not made calls herself ("Have no need to.") The home care service had not called the client for a long time. The user said that the equipment was good and it worked well. "Sometimes the picture doesn't start." The relative who was present during the test suggested that the picture is occasionally not activated because the user takes her time to answer the call. This had caused a delay and the video connection been dropped. According to the user, the video connection was the most important feature of the telecare system ("It gives me a chance to visit.") The user was able to answer video calls from relatives and the home care service without any problems. In addition, the user made a call to another relative with the assistance of the relative who was present during the test. The first attempt failed due to the button not being pushed long enough. On the second attempt, the test facilitator helped the user ("You need to count to three.")

The profile of User B in the usability test:

- Appeal of the system: positive
- Attitude towards the system: pro
- Abilities and possibilities to use the system: no hindrances
- Safety: does not create a sense of security, but enables social contacts
- User activity: fluent answering calls, hesitant when making calls.

User C was a 73-year-old engineer. He had contacts with the home care service and with two relatives. User C said that the equipment was not working and that home care staff had not made video calls for a long time. It had also been a long time since the user had been in touch with his relatives via the system. When the test began, the system had power switched on. The user pushed the buttons on the screen (screen saver) and touched the mouse (the user had been instructed not to use the mouse). The user started a video call with the home care office, but the connection did not open and no error message was displayed on the screen. During the test, it became clear that the connection failure was not caused by a fault, but the home care had been in the middle of a video call with another user at that time. The system at the home care office had indicated that User C was trying to call. The user called the home care again and proceeded without hesitation. He also didn't hesitate when the home care service contacted him.

The profile of User C in the usability test:

- Appeal of the system: neutral
- Attitude towards the system: pro
- Abilities and possibilities to use the system: no hindrances
- Safety: does not create a sense of security
- User activity: routinised, brave

The usability test was designed to provide a possibility of recording action stories on video at the same time. However, the users were not able to proceed as planned, which meant that while the test proceeded on the users' terms, the assistant gave a prompt if the user was not able to carry on. Two of the three users were able to use the system well. One of the users gave up, but the

reason was probably the fault in the equipment which had resulted in frustration and aversion towards the equipment.

The following facts were determined in the tests:

- The system is mostly easy to use.
- Good experiences promoted positive attitudes towards the system.
- The system did not promote a sense of security.
- The receiver was a well recognised symbol for starting and finishing a call.
- The length of the ring (when the user's telephone rang) was too short.
- The length (duration) of pushing the button to activate the system was unclear to the users.
- The use of browsing buttons was unclear (in order to view all options when making a call).
- Error messages were not displayed during a fault or in unclear situations.
- A mouse which was attached to the equipment had been left for the users, even though they were instructed not to use it.

Development suggestions:

1. Use of symbols and the touch area

The receivers were red and green; colours which are not suitable for the colour blind. It would be advisable to change the colour and review the size of the receiver symbols at the same time. The majority of the screen is currently empty. The receivers could be made bigger to provide a larger touch area.

The telephone symbol for starting a call could be similar to other symbols currently in use. The "Making a call" text is unnecessary. The touch area, text and symbol could also be bigger in this stage.

2. Feedback, error messages and functions should be designed to prevent making errors.

Each action should be followed by a clear notification of whether the action was successful. A larger touch area would increase the success rate and prevent errors. The notifications could be intelligible voice messages, for example: "Try

again", "Press for longer", "Calling the destination", "The call has finished", "The number is engaged".

The mouse is needed for operating the system, but if the idea is to prevent users from using the mouse, it should not be left in place. System operators could bring the mouse with them when needed.

3. Screen design

The size of the receiver symbols was already mentioned, and the fact that the majority of the screen is unused. The call list design is such that it grows in height, which means that at some stage when the number of call destinations exceeds a certain limit, the user has to scroll the screen with the up and down arrows.



Figure 6. Receiver symbols

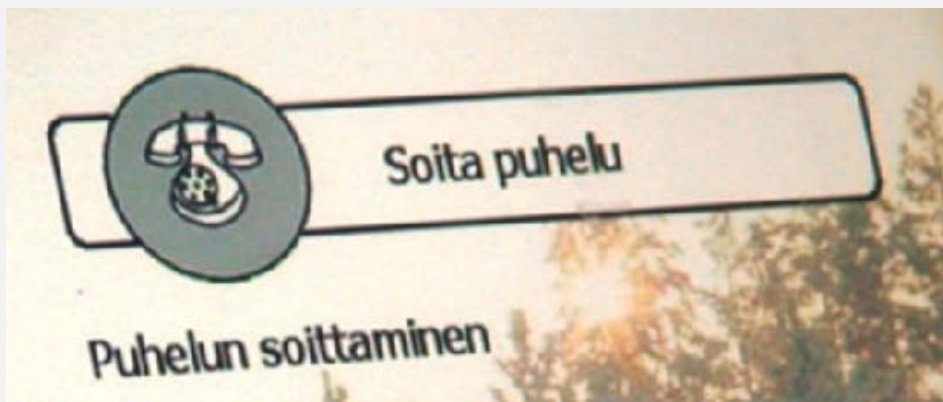


Figure 7. Symbol for starting a call

The down scroll arrow is partly under the "End the call" button. The button is not needed at this stage.

The screen also has a Search option. This function is probably too demanding.

Allowable calls could be located on the screen in rows of two or three, which would reduce the need for scrolling. On the other hand, this could make finding a person on the list more difficult. Users could have different layout options for the screen.

4. User-specific settings

The system should have user-specific settings to determine

- How long the touch has to last to get a response. Hand tremors can make it difficult to push for long.
- How long the call rings if it is not answered. The user may have slow movements and needs time to answer the call.
- How the call list is displayed.
- Whether audio notifications are given and at what volume.

5.5 Assessment of Competence Creation

5.5.1 *Interactive CaringTV as a learning platform*

Päivi Immonen-Orpana

In recent years, service innovations have emerged strong alongside technological innovation. Innovation activity is nearly as common in services as in manufacturing. This is far from the conventional belief that the service industries are primarily consumers and users of service products developed by the manufacturing industry, rather than independent innovators. In research and innovation statistics, service innovation is seen in largely the same way as technological innovation. Service innovation is a new service or a reform of an existing service which has been implemented and benefits the developer. The benefit is usually a result of the added value that the client gains by deploying or utilising the innovation. In addition, the innovation must be new for the business that develops it. (Academy of Finland 2008).

The students of Laurea University of Applied Sciences have participated in the development of welfare service innovations by producing programmes for CaringTV in the Safe Home project as part of their degree studies. The outcomes assessment is divided into inputs, activities, outputs and impacts. The

development of student competence is one of the areas to examine in the project outcomes assessment. (Academy of Finland 2008). The areas considered in the impact framework of the Safe Home project are described in the table below (Table 15)

Table 15. Table. Learning and competence development indicator framework in the evaluation of competence development in the Safe Home project.

1. Inputs	Starting point - existing knowledge and competence
2. Activities	Education/study units implemented partially or fully as part of the CaringTV programme production
3. Outputs	New knowledge and competence, dissemination and use
4. Impacts	Improvement in theoretical and other areas of competence

Indicator framework contents

In the Safe Home project, the students' learning, learning process, and competence development were evaluated using improved Vee heuristics, due to positive reports about their use in previous studies (Immonen-Orpana 2008 a, b, 2009). Heuristic is a universal model which provides a metaphorical estimate of the required problem-solving structure. It is considered a metacognitive tool for high-quality learning due to its ability to guide the student's learning process. A Vee heuristic is defined as a method that provides a fast way of getting sufficiently close to the best possible outcome in a learning process. (Åhlberg 1993.) The improved Vee heuristic contains ten steps (questions) that lead to a high standard of learning, thought and action which comply with the inputs, outputs and impacts of the indicator framework. Åhlberg's (1993) Vee heuristic question 9 was expanded on as follows: "Competence: What are the main knowledge and skill-related outputs of my learning process? "

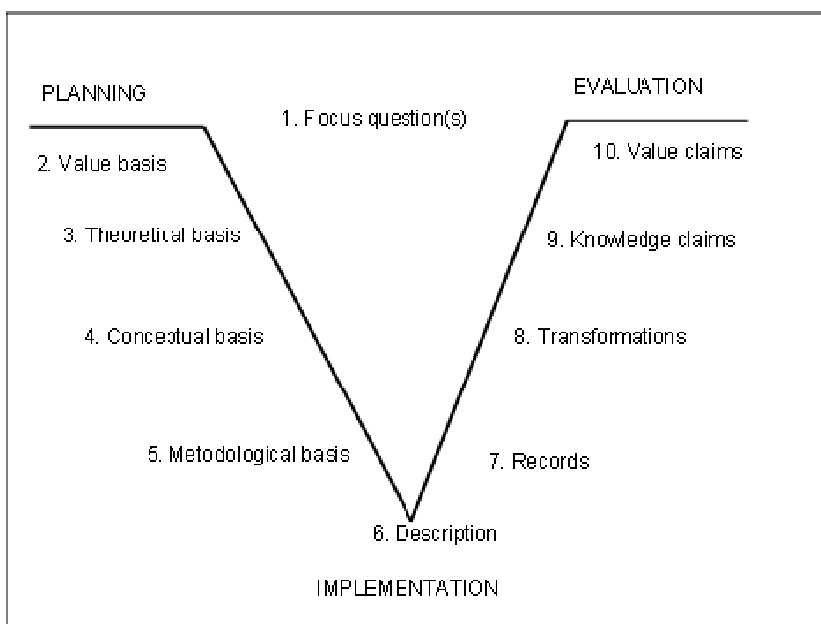


Figure 22. Improved Vee heuristic (Åhlberg 1993).

All students who completed a specific study unit as a group as part of CaringTV programme production monitored their personal learning processes and competence development by using improved Vee heuristics. A total of 133 students participated from the Degree Programme in Physiotherapy (N=66) and the Degree Programme in Nursing (N=67).

INPUTS

Vee heuristic questions 3 and 4 mapped the existing knowledge of students - conceptual and theoretical base - about the programme topic and the focus group before the beginning of the study unit. Nursing students had chosen programme contents of which they had a lot of existing conceptual and theoretical knowledge. Similarly, the physiotherapy students began their programme planning by studying their chosen programme theme or by adapting existing knowledge to the needs of the focus group. Both the client group and the programme themes were new to them, although physiotherapy methods had been discussed in other degree studies, however not in the context of the client group in question.

Examples of nursing students' responses

(3) *"I already knew quite a lot since hypertension and its prevention are an important part of many illnesses, and therefore it has come up a lot."*

(4) *"Reducing salt, lifestyle advice and healthy diet"*

(3) *"The topic was quite familiar because it was recently discussed on another course and [I] had basic knowledge about the topic"*

Examples of physiotherapy students' responses

(3) *"We hardly knew anything about developmental disabilities before the project. We found it interesting for that reason, and that was one of the selection criteria. The learning process was affected by the lack of background information about the group, and the diversity of the group (different types of disabilities), and that is why personal planning was difficult."*

(4) *"Familiar concepts included functional ability, physical, mental and social wellbeing, physical activity for groups. Developmental disabilities and adapted physical activity were not very familiar concepts, and we had to open them out. Opening the concepts made the work easier and helped [us] to design and justify the chosen exercises."*

ACTIVITY

Vee heuristic questions 5, 6, 7 and 8 described the learner's activity as the basis of programme production. Both the nursing students and the physiotherapy students used the CaringTV programme production activity to complete degree studies which focused on the guidance of clients/patients as one of the key objectives. For physiotherapy students, the study units focused on interaction skills, guidance and teaching in physiotherapy, or adapting physiotherapy to different client groups. With nursing students, the focus of the study unit was on guiding, assisting and supporting clients using welfare technologies.

All students found the required background information either from course materials or by searching from different databases. The students' ability to use international databases varied greatly. The majority of nursing students relied on material handed out in class. Physiotherapy students relied on databases and, if

designing a series of programmes, on feedback received from the clients. The students described their activity as follows:

Examples of nursing students' activity:

"Sources included online sources, medical textbooks. I had to find enough information about the topic and the general principles of the prevention of hypertension. The following sources were used: the medical textbook was a good source, along with reliable online sources such as the Finnish heart association website. Because the most important and practically only factors of prevention are healthy lifestyle and exercise, I emphasised them. Also if the information comes from a reliable source I can assume that it is correct. Because the most important and practically only factors of prevention are healthy lifestyle and exercise, I emphasised them. Also if the information comes from a reliable source I can assume that it is correct."

Examples of physiotherapy students' activity:

"I had to find theoretical information and use it to design a programme that develops muscle endurance as effectively as possible. The programme had to be sufficiently easy for elderly people. I found a lot of information about exercises for the elderly, but not all information had a scientific basis. I found a lot of "outdated information". Everyone knows that physical activity is good for us all, regardless of age. The effects of physical activity on the functional ability of elderly people have been studied extensively, and the results are mostly similar. Overall, the results suggest that the type of exercise is not so important; what is important is that the person exercises."

OUTPUTS and IMPACTS

Questions 9 and 10 of the Vee heuristic described the learner's conception of the development of his or her competence in the programme production process and, on the other hand, how the learner valued the achieved competence and the learning process. Åhlberg's (1993) Vee heuristic question 9 was expanded on as follows: "Competence: What are the main knowledge and skill-related outputs of my learning process?"

In the beginning of the study, only half of the students felt that they had learnt during programme production. As the project progressed, nearly all students felt

that they had gained valuable competence. The initial expectations were related to professional competence, which explained the students' perceptions. Nursing students did not feel they had gained new knowledge, but they felt they had gained guidance and interaction skills instead. As the project progresses, the importance of interaction skills and competences related to coming face to face with the client were emphasised. CaringTV was conceived as a highly valuable learning environment.

Examples of nursing students' learning experiences:

"CTV was completely new to me, so I did learn about that activity. I did not learn much new about the topic itself as I already had a strong knowledge base about it. Therefore the key issue was to learn more about interaction via a TV screen. In terms of my learning, this topic was not very useful as I already knew a lot about it. However, using the CTV and designing programmes were useful as learning processes. We reinforced our knowledge about these illnesses; we learned interaction and guidance skills and cooperation skills."

SUMMARY

The Vee heuristic proved a versatile method of data collection in the development of both the learning process and perceived competence. During the monitoring period, the students' views about their competence development changed, shifting the focus from professional competences to global competences. The students mostly saw the learning process as valuable. The data collection process and the conclusion reports suggest that the students should be directed more towards critical evaluation and justification of their activities.

As a learning platform and environment, CaringTV was a suitable environment for study units that focus on the guidance of clients. During the project, different focus groups got involved, and the students were able to practice with clients from different age groups. The amount of instruction given by the students in programmes varied. Physiotherapy students mostly produced series of 4-5 programmes, while nursing students produced on average 2 programmes. This partly explains the highly positive learning experiences of physiotherapy students. What's more, producing a number of programmes for the same client group gave opportunities for closer interaction and adapting programmes based on feedback.

While the roughly 600 programme sessions produced by 133 students who took part in the learning process evaluation constitute only a part of the total programming, the results give a good indication of the possibilities of CaringTV as a tool for supporting both vocational and global competences that are part of degree programmes.

5.5.2 Experts' competence development and changes in work

Elina Vuorio

Promoting the individual's wellbeing and personal resources requires a multidisciplinary team of experts. The starting points for this kind of work should be the expectations, needs and personal circumstances of the client and his or her relatives and loved ones (Lehto 2008). The same applies to the use of welfare technology as one of the ways of bringing services to the public. The development of guidance and counselling services is aimed at using new IT knowledge to produce applications that are based on, or promote, interaction. This would facilitate the use of preventive wellbeing services and promote a person's independent living and unrestricted participation in interaction with peers, relatives, etc. The deployment of welfare technologies directed at different target groups requires a lot from the workforce, including the ability to motivate and instruct the users. Therefore, interaction, social support, and the exchange of experiences have a significant role in the deployment of new systems. (E.g. Vuorio 2009.)

One of the areas examined as part of the evaluation study of the Safe Home project was the development of competence and expertise. In particular, it was the focus of the subproject carried out in SouthWest Finland. Competence and expertise are examined with the focus on the change of work and the structures of welfare services. Social changes are linked to the development of expertise. Interdisciplinary education and multidisciplinary competence are highly sought after on today's job markets. The trend is also evident among welfare operators: social and health care experts are expected to have multidisciplinary competences and a developmental approach to their professions. (E.g. Eteläpelto & Tynjälä 2005; Kirjonen, Remes & Eteläpelto 1997.)

The social and health care sectors have a lot of tacit knowledge. One important goal of the Safe Home project was to capture and make this knowledge explicit. The expertise aspect was taken into account in different stages of the project process, for example in the planning of eService contents and in the selection of

focus groups. The experts also had an important role in interpreting the action research data. This ensured that the experts' voice, the local interpretations of the data, were given due consideration in reports. Analysing data on a continuum provides a chance to identify positive and negative developments in clients' wellbeing and to evaluate the role of technology in the everyday lives of clients and the workforce. The interpretation of data requires local expertise: knowledge about the operating environment, resources, and the methods used by municipalities to promote the wellbeing of the residents.

In Finland, very little research has been conducted on the use of welfare technologies in the everyday practice of social and health care workers. Therefore, the outcomes of the Safe Home project may lead to further research on the subject. One of the goals of the Safe Home/OMANA subproject was to examine this question from the point of view of SouthWest Finland.

Experts' views about the role of welfare technologies in everyday practice

In March 2011, as part of the Safe Home/OMANA project, focus group interviews were conducted with local partners from Laitila (N=5), Salo (N=3) and Turku (N=4) who had been actively involved in the project. Corresponding data from 2009-2010 was also considered in the summary of outcomes as applicable. A total of 28 individuals from the social and health care sector took part in the interviews.

According to the experts from Laitila, Salo and Turku, the increased use of technology had not yet brought significant changes within the contents of the workers' everyday practice. In recent years, technological development has been significant, and technologies have become both more reliable and easier to use.

"For example this telecare system is not very complex, at least not to the workers, if only the technology worked all the time, as it is a Skype-based solution. I cannot say much about the PC connections of CaringTV, but the clients at least seem to know how to use the equipment."

On the other hand, the use of new technological devices can still be problematic to some, due to negative attitudes towards anything that is new and the fact that technology is not necessarily seen as a work tool that can provide benefits from the point of view of clients. Changing these attitudes requires a lot of work - it is about conquering the workforce's fears. When this succeeds, the use of technology as a tool in everyday practice is usually seen as positive. In this

regard, some of the social and health care workers who took part in the project have gained improved IT skills, and the pilot has made their work more versatile. In spite of this, in environments such as service houses, the workload and the poor health of clients may prevent and/or hinder the workers' ability to adopt new technologies, even if they could provide new content and help in the everyday practices of eldercare.

"The project has brought new competence in working with technologies. You have more courage to try new things, it makes you proud to be able to do something, and on the other hand, you are more open to learning something new."

"The CaringTV equipment is straightforward to use (good user instructions and helpdesk features). Basically, it has developed group instruction skills, i.e. what is needed in the virtual world. In the future, the device and its functionalities could facilitate many forms of communication within different networks (e.g. relatives, peer groups and worker consultations). From the worker's point of view, it has provided experiences from new type of interaction."

Nevertheless, there has been interest in welfare technologies and, for example, the experts who have taken part in CaringTV programmes and eServices (e.g. the experts who visited the Tuesday group in Salo, and the experts of Laitilan Terveyskoti and Kotikunnas in the so-called general CaringTV programmes and eServices) have been enthusiastic about this form of work. The interviewees saw CaringTV and telecare system as a potential new working tool alongside conventional systems in the future. Even if a lot of time may be spent learning the new things in the early stages of the experiment, it is certain that the lost time will be recovered later."

"This is the future that has to be taken into account in a geographically large municipality, and the benefits of new technology must be used. It is a fact that the taking of medication at night could be supervised remotely ... There could be a night nurse who would oversee the night-time medication of 10 people for example ... The biggest challenge is to get the relatives on board, because we can get the clients on board a lot easier ... [It] should be marketed and turned into a national trend ... Contact with relatives is also an important part of this. It is about

supporting sociability, although that is not part of the statutory municipal services."

The interview results show that it is commonly thought that only the care work is "real" work in the field of eldercare. A cultural change is required to bring about the ability to see and understand the importance of different types of care work. Pilot programmes such as the Safe Home project strengthen the belief that different types of care will be valued more in the future and that help can be provided by other activities (e.g. socio-cultural activities) and not medical care alone.

The local experts felt good about being trailblazers in the use of welfare technologies which will be part of everyday practice in other municipalities in the near future. All in all, participation in the trial has generated new forms of cooperation and good reputation.

"We at the municipal eldercare services now have a strong feeling that we will continue to actively use welfare technologies ... With new technology, we can reach dozens, even hundreds of people, but reaching the masses requires the input of city workers. In other words, even though there may be savings in costs such as travel expenses, the use of this kind of new virtual services requires more human resources. In the end, technology cannot replace people."

"Nevertheless, participation in the project is a good visible example that we are involved in development and that we are interested in cooperation."

5.6 Technological Solutions in the Safe Home Project

Mika Arvola & Ville Nieminen

CaringTV is based on videoconferencing technology, and it works via an internet connection. The CaringTV system includes the CaringTV hardware and software. The system is a closed system and requires an account. Three different types of CaringTV solutions exist. In addition, clients can opt for peripherals which are integrated into the CaringTV system. The basic CaringTV setup includes a computer, a monitor, a camera, and a speaker microphone or an earphone-microphone headset. Peripherals include different monitoring devices and safety bracelets. The CaringTV hardware supplier in the Safe Home

project was Videra Ltd. Peripherals were supplied by Medixine Ltd (remote monitoring devices) and Everon Ltd (safety bracelets).

5.6.1 *CaringTV and other technologies*

This chapter provides an overview of the different hardware configurations of CaringTV. All hardware is operated under the same system. CaringTV is implemented using the Vidyo videoconferencing software. The Vidyo system included server software and client software. Vidyo provides multi-party conferencing using videoconferencing bridges i.e. servers that distribute audio and video to the users. The servers are maintained by Videra Ltd.

The client software is available for different platforms. The Vidyo system can transfer HD quality video and share a desktop between multiple users. However, the sound and video quality depends on the internet connection speed. The Vidyo system uses scalable video coding (H.264 SVC) which can dynamically adapt the video quality based on the connection speed. Vidyo supports nearly all USB video and audio devices.

As the name suggests, CaringTV Broadcasting Centre is designed for transmitting programmes to clients. In addition, Broadcasting Centre units were placed in Espoo service houses where groups can take part in the programmes. The Broadcasting Centres are more robust and versatile than the other configurations. The Broadcasting Centre comprises a processor (codec), a larger TV screen (usually a 40-inch high definition television), a videoconferencing microphone and remote-controlled camera which can be turned and zoomed (Pan-Tilt-Zoom, PTZ). The equipment is controlled with a remote control. The Broadcasting Centre can also share a desktop with other computers via a separate data cable (VGA connection).

The microphone system can be upgraded to include features such as external sound to provide a higher quality of sound to the client, for instance when playing music.

In most cases, clients have a CaringTV with a touch screen. A separate, easy-to-use interface has been developed for the touch screen. Two different touch screen solutions were used in the project. The older touch screen solution comprises a separate processor and a 14-inch touch screen which is usually connected to a larger monitor, such as the client's own television. The more

recent solution is a 22-inch touch screen display with an in-built processor. Both solutions include a webcam and a table microphone.

The client's touch screen has buttons which the client can use to create a direct connection with a relative or a CaringTV programme, etc. In addition, the buttons can be used to access programme listings and the Clinic monitor service platform for personal readings and results. The touch screen view can be customised to the client's individual needs; for example, the locations can be determined based on the client's needs. Similarly, if the client has difficulties with reading, symbols can be used exclusively. The touch screen also provides access to a telephone directory for making point-to-point video calls with other users of CaringTV or with one or more relatives.

The mobile solution includes the CaringTV software only (i.e. Vidyo software). The software is installed on the user's personal computer. The software is available for Windows, Linux and Mac OS X. In addition to the software, the user needs a webcam and a microphone. If required, clients have been provided with the same webcam and table microphone that is used with the touch screen units. However, in many cases the table microphone has been replaced with a headset which makes one-to-one conversations easier. The mobile solutions have been used by clients' relatives and some experts.

Other tested technologies

In addition to CaringTV, remote monitoring devices by Medixine and safety circuit solutions by Everon have been used in the project. These technologies include the hardware and web-based management interfaces.

Remote blood pressure meters and weight scales by Medixine were used in the project. The devices send the readings automatically to the Medixine server via a mobile phone. The readings can be viewed on Medixine's Clinic monitor application which is integrated into CaringTV. The nurse and the doctor also have access to their clients' data for consultation purposes.

The remote monitoring package includes the Clinic monitor application which provides users access to their readings and the ability to input readings manually. During the project, blood pressure and weight readings could be taken with the remote monitoring devices, which then automatically submitted the readings via Medixine's server to the Clinic monitor application. Users could also access the Clinic monitor application to enter blood glucose readings and to assess their personal physical health using a VAS pain and wellbeing scale.

In addition to Clinic monitor, the eNurses and eDoctors who were involved in CaringTV could view their clients' readings using Medixine's client interface. The client interface can be accessed with a web browser from a personal computer. The operators can also enter notes about the client in the interface. The eNurse and eDoctor have been able to communicate with each other about clients' health this way.

Example: A home user has Medixine's remote monitoring devices and a weekly consultation with the eNurse. The user takes blood pressure and weight readings every morning, and the readings are transferred wirelessly to Medixine's server. The readings are discussed during the weekly eNurse consultations. The eNurse can view the readings on his or her own computer using Medixine's client interface. The nurse doesn't have to visit the client - or vice versa - for this purpose.

Two different safety bracelet solutions were provided to the project by Everon Ltd. The Care safety bracelet only works in the vicinity of the client's home. The Care system comprises a receiver installed in the client's home which relays the alarms made on the bracelet and enables the receiver of the alarm to have voice contact with the client. The Vega bracelet has added GPS and GSM features. Vega can be used to issue alarms from any location, including those outside the home. In addition, the alerted party can locate the bracelet user with a web link and map service. The Vega also includes a receiver installed in the user's home. The receiver can be used to charge the bracelet and to reduce the use of the battery.

Everon's safety bracelets also include client interfaces which can be maintained with a PC and a browser. The Care bracelet interface includes client information, details of the client's support network, and configuration data. The configuration data can also be modified via the interface. For example, if the phone number of a contact person in the support network changes, the number can be updated via the interface. The Vega bracelet interface can be used to view the client's information and to see the client's location on a map. Both interfaces are designed to be used by the support network, not by the clients themselves.

5.6.2 *ArctiCare telecare system*

The ArctiCare system is based on a standard PC with a touch screen display, and it works via the internet. The system can be used for video calls and/or tracking & alerting. The ArctiCare telecare solution can be installed in the client's

own home or in a service house or other eldercare environment. The system is a comprehensive communications and alarm system consisting of a central unit and client devices. Multiple client devices can be connected to a single system.

The solution offers various services to elders, care workers and relatives. Senior citizens can use the system for easy video-based communication with relatives and care staff. In addition, various added value e-services can be added to the system, such as games, guided hobbies and contact with different types of events. The ArctiCare system can be upgraded with a tracking facility for indoors and immediate surroundings as well as automatic alarm functions in situations where the user is unable to trigger the alarm personally. ArctiCare also provides security benefits for care staff. The system provides a comprehensive event report which can be archived for later use.

Functions of ArctiCare

The tested functions of ArctiCare include the video call and tracking & alerting. Both functions work together in the same system. The system is based on the Microsoft Windows XP operating system and Skype and/or Java software. Power supply is backed up with a UPS system in all configurations to secure operation during power cuts and other disruptions. The keyboard and mouse have been removed from all client configurations in order to avoid a computer-like appearance.

If the ArctiCare system is used as a videophone, the system automatically boots to the customised touch screen interface that controls the Skype application running in the background. This means that in theory, the user can contact any person who has a Skype account. In practice, the user cannot select the persons directly from the interface; instead, they have to be selected within the Skype application itself. The customised interface is very intuitive, and features such as photographs can be linked to the telephone directory entries. The links and the user list are maintained by the supplier, which also effectively blocks marketing calls and other such messages on Skype.

The hardware is the same processor used in the video call, with the exception that in this feature, the client does not have a display. This means that the client does not need to use any equipment. The client's home or other living environment is divided into separately controlled zones (similar to a floor plan). The system compares the location of the client (or, more specifically, the sensor) to the alarm rules. If any of the rules are breached, an automatic alarm (e.g. via SMS) is sent to the control centre and to predetermined individuals. Alarm calls can be sent to multiple recipients. For example, one of the monitored zones

could be a balcony. In winter, if the client stays on the balcony for longer than 10 minutes, the alarm is triggered. The sensor is usually worn on the wrist; alternatively, it can be sewn onto clothing or hung around the neck. The sensor also has a regular alarm button similar to a traditional safety bracelet. All alerts, acknowledgments etc. along with their descriptions are archived in the system, and reports can be accessed retrospectively to the accuracy of one minute.

All of the above solutions can be used simultaneously, which means that when an alarm is received, a video call can be made to the client to check the situation before taking action. If required, the video connection can be configured to open automatically without the client's response to provide a live audio and video connection to the client's home.

Technical problems

Technical problems have mostly been related to connection failures or the software itself. In terms of the connection, most problems have been solved by resetting the ADSL modem. Alternatively, an optional GSM modem can be installed to provide a back-up connection during faults in the primary connection. The supplier has implemented this option in some of its previous deliveries.

Software-related problems are mostly caused by the operating system. The customised interface is programmed using Java, and the interface itself works well in most cases, but problems were caused by the Microsoft Windows XP operating system when features such as certain update notifications had not been disabled. When the update notification was displayed on the screen, the interface closed down or went to background, causing problems to the user. The system can be maintained remotely, but dynamic IP addresses caused problems. These problems could be avoided by using static IP addresses, dynamic DNS, or a solution such as Logmein.

The tracking & alerting service had fewer problems, and they were mostly related to sensor sensitivity and the customisation of rules. When the sensors had been adjusted for the rooms and the rules were customised to suit the client's needs, there were no more major problems or unnecessary alarms.

During the project, problems were experienced in the computers of home care personnel, for example with Skype and audio settings, which meant that the video connection didn't always work. However, the supplier cannot be blamed for these problems as they are commonplace in many different situations due to multiple users or the way the computer is used. Some relatives had similar problems, while others had no problems at all.

Final assessment of technology

The system concept was highly usable, and with some product development, the system could be made into a highly effective solution. For example, replacing the standard Windows XP with a more integrated or customised operating system would help to eliminate problems such as those caused by updates. Using dynamic DNS would help solve the problems related to remote use. It could be connected at the router-level and a shell connection or similar could be provided for resetting the primary connection.

Replacing the processor with a smaller one would help to hide the hardware. The current version was too large, and the fan noise was somewhat distracting to the clients. In the videophone version, the hardware could be replaced with one that integrates the processor and the display.

The system offered the possibility of adding recreational and stimulating features, such as different types of games (memory games, etc.). These features were not used during the project, but the project team did have the opportunity to try them in the supplier's other systems. These features could be useful in all deliveries, and the added value they provide would certainly appeal to some of the users.

All in all, the system would be highly usable with further productisation and development. In its current form, features such as access to Skype within the TV is certain to provide opportunities for many other uses, not to mention mobile devices (tablet PCs). (Figure 23).

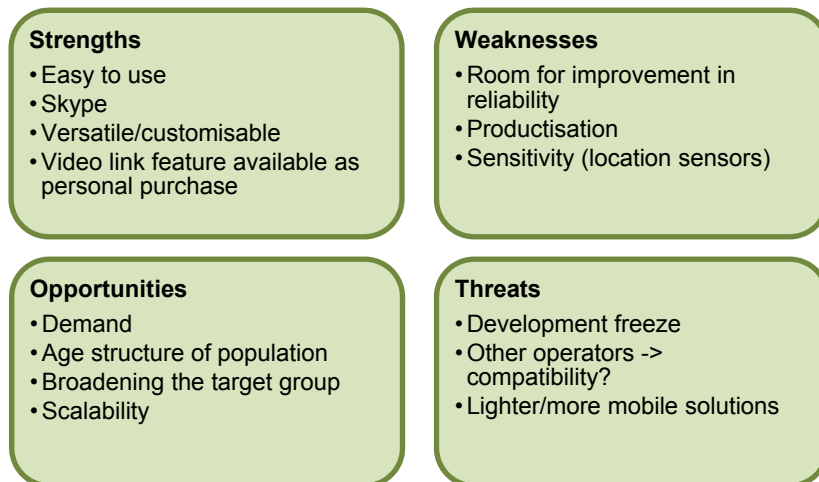


Figure 23. ArctiCare SWOT

5.6.3 Technology assessment

The following is a SWOT analysis of CaringTV identifying its strengths, weaknesses, opportunities and threats. (Figure 24).

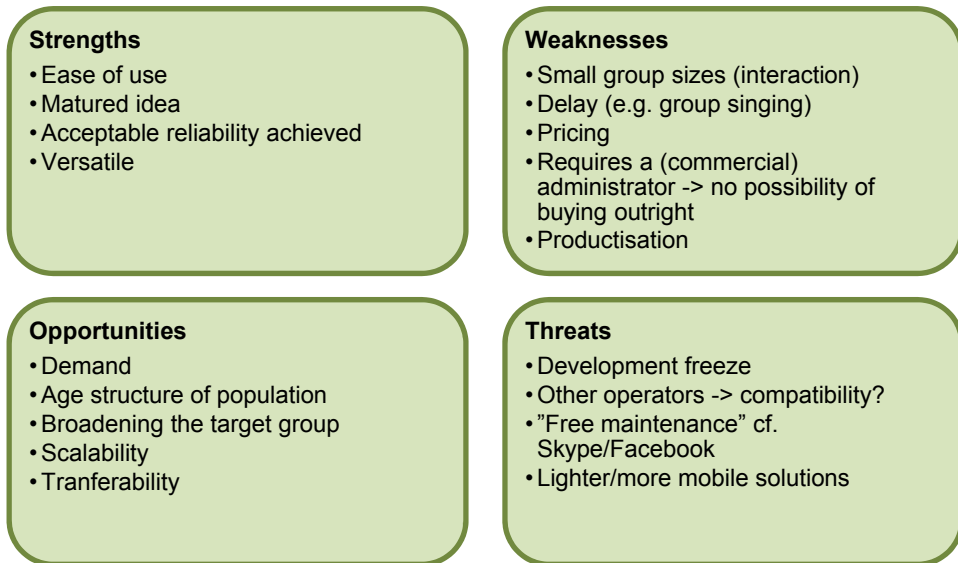


Figure 24. SWOT analysis of CaringTV

The pros and cons of the CaringTV system are presented in the table below. The tables are divided into three categories: CaringTV solutions (Table 16), Medixine's remote monitoring devices and the Clinic monitor application (Table 18) and Everon's safety bracelets (Table 17).

Table 16. Pros and cons of CaringTV systems by user group

CaringTV solution	Pros	Cons
Broadcasting Centre (group/service houses)	Large screen	Sound (background noise, space) Requires a camera user
Broadcasting Centre (presenting programmes)	Moving camera Large screen Desktop can be shared	Only one camera angle Requires its own space
Touch screen (home user)	Easy to use Large screen Versatile	Many cables
Touch screen (expert)	Easy to use	Many cables
Mobile (home user)	Doesn't require huge investment Desktop can be shared	Requires some IT skills
Mobile (expert)	Can be portable if necessary Desktop can be shared	Requires some IT skills Maintenance

Table 17. Pros and cons of Everon safety bracelets

Evaluation of Everon's safety bracelet		
Bracelet:	+	-
Care	Simple Easy to use	Home environment only Requires a separate base station for receiving alarms
Vega	Simple Tracking Voice connection	Requires daily charging No ringtone Ergonomics

Table 18. Pros and cons of Medixine's systems and services

Evaluation of Medixine's services		
System/service	+	-
Blood pressure meter	Easy to use	Uses a lot of batteries Stiff sleeve
Weight scales	Simple Reliable	-
Clinic monitor application	Intuitive Easy to use	Small keys Entering numbers via the touch screen takes a long time
Telephone	Does not require any actions from the client	The software does not stay functional (requires occasional resetting)

Technical problems

The majority of technical problems were related to connection problems or sound. In terms of data connections, most problems have been solved by resetting the ADSL modem.

In most cases, sound problems were related to feedback, since the majority of the environments (e.g. clients' homes) were not acoustically designed for videoconferencing. Other noises (e.g. a doorbell) can sometimes cause a situation where the sound circulates each user at a different time due to different delays in the connection. These problems have been solved by replacing table microphones and changing the practices. Most of the clients are able to close the microphone in certain situations and open it when they wish to speak.

The image quality has been excellent in nearly all cases. The main problem in terms of image quality is the internet connection speed. Low connection speed has meant that the picture has not updated fast enough, or the resolution has suffered considerably. Especially those clients who live far from city centres can be affected by slow connection speeds when the distance to the service provider's node is great.

Videra's servers have worked reasonably well. The system crashed a few times, causing programme cancellations. The time required to solve the problems

varied from some hours to several days. The stability of the system should be improved. The way system problems are communicated could also be improved.

There were some system faults that required a visit by a technician. In most cases, the technician could solve the problem (e.g. problems with software), but defective hardware had to be replaced in some cases. The supplier was able to solve some problems remotely, if the system booted to the operating system and a data connection was available. However, the frequency of these problems is most likely statistically no higher than with regular PCs.

6 Discussion

6.1 Ethical Aspects of the Study

In the Safe Home project, permission for research was sought in accordance with good research practice both from Laurea University of Applied Sciences and the municipalities that participated in the project. Permission was granted by all municipalities. The Ethics Committee of Laurea reviewed and approved the application for research permission. The ethical research guidelines and practices of both universities were complied with during the project.

The research participants included elderly people who lived at home or in service houses or accessed their day centre services, people with developmental disabilities, mental health patients, and families and young people who were clients of child welfare services. Since all participating individuals and groups were ethically challenging, vulnerable and sensitive, the ethical aspects of the study were closely monitored and the participants' rights were vigorously protected. All research participants were requested to provide informed consent. The purpose of the study and the rights of the participants were carefully explained before the participants gave their consent. Particular care and consideration was given to data collection such as interviews. Each person who took part in the project committed to and agreed to be bound by the duty of confidentiality. Each stage of the project paid attention to ethical and legal rights, ensuring that participants were not harmed at any time (cf. Leino-Kilpi & Tuomaala 1989, Bandman & Bandman 1995, Holloway & Wheeler 1996, Vehviläinen-Juntunen 1997, Sarvimäki 2007, Topo 2007.) The research data was carefully stored during the research process and it will be destroyed at the end of the project. The research results are reported with care, documented in the final report and published in the final seminar of the project.

6.2 Reliability Analysis

The project's reliability is reviewed in terms of the action research process, the analysis of data, and the results. The action research process is reviewed with regard to the reliability of different stages of the process, the nature of data collection, and to which extent the participants' authentic voices are present in the study. The action research process has been challenging due to the number of different user groups, experts and other participants. The data was collected in different stages of the action research cycle based on the activity of each

group. The activities were carefully adjusted in different stages of data collection, for example with regard to the timing or content of interactive programmes or the suitability of eServices. Active and intensive cooperation with participating clients, experts and different actors was open and flexible. The reliability of the study may be affected by the challenging nature of some client groups, or their poor health or short participation period. Nevertheless, in such cases, data collected from the experts provided useful and reliable information.

In terms of the qualitative analysis, truthfulness, equivalence and transferability were the key aspects of reliability throughout the project and the action research process. Data analyses are based on recorded and transcribed materials. The results of the analysis have been carefully considered in different stages of the action research process. Authentic quotes have also been used in the presentation of results. (E.g. Burns & Growe 1997, Hollstein & Cubrium 1997, Nieminen 1997.) Research data was analysed by qualitative content analysis and using Glaser's (1978) Six C's model. In client surveys, the indicator piloted in the previous KOTIIN project (Going Home project) was used (cf. Lehto 2008, Puoskari 2008).

The reliability of the content of interactive programmes and virtual eWellbeing services produced as part of the study is supported by the fact that both the participating clients and the experts from different operating environments were actively involved in different stages of the project. Evaluations and feedback were immediately utilised during the project. The programmes and eServices were implemented by students and qualified experts. The transferability to different operating environments and client situations is possible both in terms of content and method without much delay. However, financial factors, procurement aspects and other such issues may delay and even prevent the rapid utilisation of the results of this project.

6.3 Analysis of the Findings

The Safe Home project resulted in the road map for the use of CaringTV as a programme platform, including the contents of interactive programmes, eServices and independent virtual contact. On one hand, the description is a complete concept which can be transferred to implement digital services for different types of user groups. On the other hand, the fact that the description is open also makes way for new and creative solutions for digital services. Based on the feedback, both the interactive programmes and the eServices piloted as part of the project were successfully evaluated both in terms of the client's point

of view and the economic point of view. Action research and userdriven methods promote and facilitate an authentic process between different actors, which means that the voice and role of users in the context of a new product or innovation is strongly highlighted. In their technology report, Heiskanen, Hyvönen, Repo and Saastamoinen (2007) emphasise the role of users in product development. The literature review and four pilots which were part of the report also underline the user's role both in research and in product development. Rask's (2010) report into research policy and its possibilities in the society also highlights the importance of users' requirements and expectations. The Safe Home project was implemented using the LivingLab approach, with different actors working in different operating environments to develop new practices such as virtual contact or eConsultations. Ranti and Kivikangas (2011) describe research activity that is userdriven, takes place in real life situations and within a broad ecosystem of different actors.

The project's outcome is the conceptual model of CaringTV which is based on the concepts of participation, interaction and empowerment. The conceptual model consists of promoting factors, inhibiting factors, contents and methods, and the meaning of CaringTV to its participants. In the project, both the clients and the experts had an important role from the point of view of the project development. The results of their participation, evaluations and joint workshops have been used to take the project forward with a userdriven approach. Participation by users can result in better functionality and usability of services. (Heiskanen et al. (2007) argue that user experiences and feedback can provide improvement ideas with regard to the usefulness and appeal of products, and new product ideas for businesses. One aspect of the userdriven approach is the desirability of the technology. Raappana & Melkas (2009) also argue that if the users find the products and services appealing, they can be used in a more productive way. Clients and all parties should have a clear idea about what need is being fulfilled with the technology. The functionality of technologies and the related services is an important development area from the point of view of the society as a whole. Good planning pays dividends in the future. (Raappana & Melkas 2009.)

The feedback from different users highlighted participation, interaction, empowerment, and the reflection of these concepts as a sense of security and activation. According to earlier studies (cf. Mönkkönen 2007), empowerment is a process that starts from within, but it is also influenced by whether the worker believes in the client's potential. The desire for change requires a sense of continuity and predictability in life, and the feeling that the person can influence

his or her own life. Individuals do not have enough influence - resources for change are sought at the community-level. Empowerment also takes place in a social process, in which case interaction with others is a significant factor of empowerment. Rostila (2001) also argues that the attempt to improve the situation of a client or an underpowered client group must be based on the client's own resources and wishes.

Technology

The CaringTV interface and other technologies were piloted with several different client groups. The evaluation data shows that CaringTV was easy to use according to different users and experts. According to a study on the factors influencing the adoption of telecare solutions, factors related to the operating model include ease of use, benefits and needs. These factors were also evident in the activities and use of technologies in the Safe Home project. Staff-related factors which can influence the adoption of a new telecare solution include attitudes and shortage of time. Other important issues were the possibility of trial use, the availability of technical support, and the workers' technological orientation. Factors related to the ease of use included technical ease of use and the accessibility and functionality of the equipment. Technical problems and distractions impeded the adoption of the technology and resulted in cancellations. Perceived benefits of telecare included better results in care opportunities and results, and the patients' increased access to support in their personal care. (Vuononvirta et al. 2009.) Earlier studies indicate that further development of alternative technological solutions is needed in order to meet different user groups' expectations regarding the availability of virtual services. In a study by Lehto (2008), the evaluations of the CaringTV technology focussed on picture quality and delays in sound. Even a short wait could result in distracting or overlapping speech. The touch screen should also be developed so that the displayed text would be sufficiently large for reading programme information and other texts.

6.4 New Operating Models

Virtual contact between clients and experts was piloted as part of the project. A process description and cost calculations were produced for virtual contact between a young person and a social worker. Remote technologies provide endless possibilities with regard to conferences, meetings and training events. The time otherwise spent on travel can be used for other work, even if meetings are occasionally attended in person. Clearing the personal work schedules and

testing different types of remote solutions releases more time for working with clients. Not everything can be replaced with virtual contact, but it does provide a useful addition, helping to perform tasks more effectively and providing different content. Courage to try out new ways of working is required along with personal consideration of what could be done differently.

The development of various electronic services is a goal in many municipalities. However, virtual contact between clients and experts is rarely used in Finland. This is partially down to the lack of compatible equipment, the lack of ability among client groups, but also the lack of operating models. There is also debate about who should pay for the equipment needed to communicate - the client or the local authority. Not everyone has access to a regular computer to communicate. The issue is how these clients could get involved in new developing services that can be produced directly at clients' homes. New services and operating models were produced in this project. Local authorities should be bolder in adopting new solutions to improve the availability of services and to ensure a high quality of service.

6.5 Competence Creation

The adoption of new technology requires integration into existing work processes and consideration of the different attitudes and abilities of the workforce. Efficient and effective use requires many changes, such as reformed work processes and structures, chaining of services, changes in tasks, and updating the competence of both the management and the workforce. In terms of the workforce, the need for education aimed at new competences is a key issue along with reduced productivity as a result of a lack of competence. Technology can make work easier, for example by facilitating remote working when different service providers can share their patient databases and electronic forms or documents. What is crucial is that all staff members have sufficient competence to be able to use technologies efficiently. (Raappana & Melkas 2009.)

The eConsultations produced in the project provided new operating models for virtual contact between clients and experts which required an enthusiastic approach from the expert. The majority of the project actors had a positive attitude and wanted to learn about the possibilities offered by new technologies. However, as suggested by Raappana & Melkas (2009), the use of technology requires that enough time be reserved for staff orientation. Thorough orientation can reduce aversion to change and prevent the negative impacts of technology.

The key is to provide thorough, continuous orientation that takes into account different competence levels and is directed at the entire workforce with sufficient time resources. New technologies create possibilities for structural reforms, new processes and operating models, new types of networks, and increasing cooperation across traditional organisational borders. According to Kanste (2011), successful leadership is a significant factor for promoting positive work attitudes among nursing staff. Leadership also has a key role in occupational wellbeing. Occupational wellbeing influences work productivity, the quality of health services and care, and client satisfaction. It also has an important role in the deployment of different technologies. The supervisor's commitment, engagement and enthusiasm promote the workforce's willingness to test and use the technology as part of their own work. Furthermore, an agent for change is needed among the workforce to promote the development within the workplace community by providing advice and encouragement to others. This way, new technologies can be adopted as part of the daily practice.

Competence creation among the students has been a key aspect of the project for both universities. In accordance with the LbD model, the students have participated as partners by planning new solutions, producing interactive programmes and eServices, and having active roles together with the project workers. The students have acquired new virtual competences for providing guidance and counselling to clients, while on the other hand, they have gained competence in facing clients in a new environment. This creates further challenges with regard to creating interaction and the planning of personal activities.

Through the project, businesses had access to a genuine operating environment, regular user feedback, the benefits of higher education research, and media visibility. Municipal representatives and third sector operators have gained experience from different technologies both from the clients' and the workers' point of view. Social and health care workers have also been able to broaden their expertise. The testing of different technological platforms and the outcomes of action research have complemented each other in important ways, thanks to the diversity of the client groups, the networks of family members and authorities, and the platforms.

6.6 Future Challenges

The Safe Home project focused on the research, development and implementation of interactive programmes and eServices for different client

groups in the context of CaringTV and alternative technological solutions in cooperation between different partners. Action research and userdriven methods were chosen to enhance the content and methodology of the project. The clear challenge was related to the planning, implementation and assessment of customised, focused and co-participatory programmes and eServices. Promoting and supporting peer production in userdriven programme production also requires additional planning, validation and research. The quality, availability and costing of eServices requires robust planning and investment in the social and health care sector. A particular challenge in eServices is the cost and pricing basis.

Interactive programmes were produced for all user groups. Reducing loneliness and providing peer discussions became important themes, especially in the elderly focus group. In the future, this kind of preventive activity may reduce contact and visits to health care services for non-medical reasons. Reducing the costs for just a handful of clients can help to save the workforce's time and improve the quality of the client's life. What's more, the cost savings exceed the equipment costs in a short time. Measures such as replacing home visits with virtual visits and reducing the number of visits to Emergency Unit are easy ways to bring savings. Virtual club activities were organised as part of the project. In the future, eClubs could be implemented using external service providers or peer/voluntary coordinators. The experiences indicate that groupification can take place in virtual meetings. According to the users, the virtual meetings felt like someone had visited them. Clients could also take part in ePrayer meetings and religious clubs provided by local parishes.

Another future challenge involves systematic research and evaluation of the contents of new eWellbeing services and the availability and effectiveness of services. The process for evaluating the best practices of the CaringTV concept began in cooperation with the National Institute for Health and Welfare in the final stage of the project. The results of the evaluation are expected in late 2011.

Cooperation with different operators, such as libraries and parishes, provides further challenges with regard to the development of new concepts, solutions and userdriven service products. Furthermore, the development of education to correspond with the planning, development and research of digital services and eHealth services is a major challenge to universities and stakeholders both nationally and internationally. The transferability of virtual services, research and further innovation offer great challenges and opportunities.

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Appendices

Appendix 1. Turvallinen Koti -hankkeen näkyvyys ja julkaisut

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- Aurala Senior Citizens' Day, 26 August 2008, Turku
- Senior Citizens' Day 24 October 2008, Turku
- Open day 1 December 2008, Laitila
- Presentation at Aurala Adult Education Centre 24 March 2009, Turku

- Aurala Senior Citizens' Day, 25 August 2009, Turku
- Living Lab seminar 3 November 2009, Helsinki
- Apuvälinemessut (Technical aid fair) 5-7 November 2009, Tampere
- "Hyvinvointiteknologiamahdollisuudet asiakkaan, työntekijän ja läheisen apuna" training event, 12 November 2009, Turku
- Vanhuspalvelujen festarit 18 November 2009, Puolarmetsä Hospital
- Studiebesök, 8 December 2009, Turku
- Vanhustyö2010 fair, 10 February 2010, Espoo Cultural Centre in Tapiola
- Interactive eService coordination 15 February 2010. Tallinn University of Technology
- "Vipuvoimaa EU:lta" project information event, 12 March 2010, Sibelius Hall, Lahti
- Training event at Aurala Adult Education Centre, 18 March 2010
- Finnish Society for Telemedicine and eHealth, XV national seminar 8-10 April 2010, Helsinki-Stockholm-Helsinki
- "Hyvät tietoteknologiakäytännöt sosiaalialalla" workshop 13 April 2010, National Institute for Health and Welfare, Laurea
- Expo 2010 Shanghai, May 2010, China
- Laurea Regional Advisory Board, May 2010, Espoo
- Laurea international audit, June 2010, Espoo
- "Ikääntyneiden taiteiden yö" event at Aurala Adult Education Centre, 12 August 2010, Turku
- Aurala Senior Citizens' Day, 24 August 2010, Turku
- Ajatuspaja e2 Think tank session on peer production, 8 September 2010, Helsinki
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- Turku International Book Fair, 1 October 2010, Turku
- Learning by Developing - New Ways to Learn, 3rd Conference on Future Expertise in Higher Education, preconference 12 October 2010. Laurea, Tikkurila
- Kotonako turvassa? seminar, 13 October 2010, Loimaa
- Gerontologisen hoitotyön päivät 28 October 2010, Turku
- KÄKÄTE project networking event, 3 November 2010, Helsinki
- KÄKÄTE project networking event, 4 November 2010, Turku
- Pieni innovatiivisten tekojen tori 22 January 2011, Lyhty, Helsinki
- Vanhustyö2011 fair, 30 January 2011, Espoo Cultural Centre in Tapiola
- TKI-kampuksilla: student event, 9 February 2011, Turku
- Sairaanhoitajapäivät 2011 fair, 18 March 2011, Helsinki
- Oppimisympäristöt & LbD, day event, 13 April 2011, Laurea Tikkurila
- Benchmarking- ja yhteistyömatka hyvinvointiteknologiayrityksen edustajien luokse, 14-15 April 2011, Stockholm and Copenhagen
- Hyvät tietoteknologiakäytännöt sosiaalialalla Innopaja-workshop 10 May 2011, Helsinki, National Institute for Health and Welfare
- Terve-Sos2011, 18-19 May 2011, Espoo
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- "Hyvinvointiteknologia työntekijän apuna" seminar 5 February 2009, Turku.
- Safe Home project launch seminar, 7 May 2009, Espoo.
- "e-palvelu aamubrunssi" brainstorming seminar 17 November 2009, Espoo.
- "Asiakaslähtöinen teknologia ja e-hyvinvointipalvelut" seminar 3 March 2010, Turku.
- Safe Home e-service seminar, 17 May 2010, Espoo.

- Tulevaisuuden e-palvelut hyvinvoinnin tukena – Safe Home project milestone seminar 30 November 2010, Espoo.
- Virtuaalipalvelut arjen apuvälineenä vanhustenhuollossa – Safe Home / OMANA project, final seminar, 12 May 2011, Turku.
- Virtuaalisuus voimavarana – teknologia mahdollistajana, final seminar, 30 August 2011, Espoo.

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All theses are available at www.theseus.fi.

A further seven theses are currently underway.

The Safe Home project was funded by the European Regional Development Fund (ERDF) and carried out in the regions of Uusimaa, Kymenlaakso and SouthWest Finland between 1 September 2008 and 31 August 2011. Safe Home comprised two main components: the Ehyenä subproject (Laurea University of Applied Sciences) and the Omana subproject (Turku University of Applied Sciences).

The purpose of the Safe Home project was to study, develop, produce and evaluate eWellbeing services which could promote the health and wellbeing of different focus groups and support rehabilitation or independent living. The research methodology included the action research approach and userdriven methods. The eWellbeing concept was developed in cooperation with clients, students, municipalities, businesses and third sector operators using CaringTV® and other suitable technologies.

In this publication, the outcomes of the project are examined from the point of view of action research and different user groups with case examples. The assessment and effectiveness are described from the point of view of clients, experts, competence and technology.

A conceptual model for CaringTV was produced as part of the project along with a range of CaringTV services consisting of interactive programmes and selected eServices.

A further challenge relates to research on the transferability and effectiveness of CaringTV and different types of welfare technologies. Close cooperation with municipalities and different service providers is a prerequisite for the transferability of the CaringTV concept.

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