

New technology in health and social services - ethics and ergonomics in videotelephone use among workers and clients

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The idea of the Multi Media Home Aid Communication system -project is to develop for homes (especially for the elderly and the disabled) and for the public and private serviceproviders new products and services based on the latest telephone technologies, wireless transfer of information, webs, multimedia, telemedicine, videotelephone technologies and so on. Project is heavily concerned on user and usability studies, which means paying attention to needs and wishes of the different kind of user groups (elderly in their homes, home aid workers e.g.) in the process of developing a new system.

1.Introduction

mmHACS –project is developing for homes and service producers new ways to communicate and contact. The project is based on the trend of rapidly increasing number of elderly people who will need more and more communication services and care. One goal of the project is to help people live in their own homes as long as they like, especially aged and disabled, and to improve people's physic, psychic and social quality of life. Other goal is to help people at the work, e.g. home-aid workers. At homes new technology and service-system can give persons more autonomy, security, activities, social contacts, choices, privacy and possibilities to influence and participate. In the area of home aid and services new technology can help to direct action in most needed fields, e.g. with the help of new technology person can do the shopping or bank affairs by oneself and the fieldworker can spend more time with the customer. New technology can also speed up the flow of true information and thus give more security both to the workers and customers.

A large consortium consisting of multidisciplinary research groups, technology and service companies as well as non-profit charitable organisations are participating in the project. The usability of the products and concepts is studied and

tested repeatedly during the project. Our aim is to build a communication network passing multimedia information between the clients of the network: the elderly, the disabled, the service providers, workers and the surrounding society. In this case multimedia communication is strongly based on videotelephone supported by voice and data. Project is also examining robotics as one part of the whole communication system. The idea is based on mobile robot, which could help e.g. emergency duty to check and act at a distance from residence. In some cases robot could also be as a reminder, alarm or keep a company.

Laboratory of Work science in Oulu has a strong emphasis on ergonomics and gerontechnology. Ergonomics is an important basis of gerontechnology. It can be described as an approach to make design user-centred. Recent trends in design include understanding of the needs of the users and the context, in which the users work or live, or even involvement of the users in the design or R & D process (participation). "Understanding" can be obtained through a user study, which helps designers to design technology that supports the users' work or other activity. (Väyrynen, Tornberg, Kirvesoja 1999)

The major idea in the mmHACS-project is to bring together the users, developers, designers, researchers and enterprises of different areas to share the

knowledge and develop the concepts. In this way the service system and equipment will immediately respond to the needs and requirements of the participants. In conceptual level we can distinguish three different goals:

1. Technical goal: to apply and develop new technology especially in the field of wireless transfer of information.
2. Economic goal: to create opportunities to save both economic and intellectual resources in developing new products and offering services.
3. Ethical goal: to offer for the different kind of groups new possibilities to act and improve this way their quality of life.

Cultural and ethical perspectives have to be taken seriously when applying new technology and services to the lives of elderly people and to the work environment. Obviously the ambition behind producing technology is to improve conditions in both environments. However, the question is whether this understanding of the processes are the results of what elderly and workers themselves express, or if its the conclusion and decision of younger people and developers of new technology.

2. Ergonomics of videotelephone use - first experiences of user-trials in laboratory and field

The method of gathering material for the study is based on user and usability studies. There has been also more general interviewing, discussing and observation with both aged and their caretakers and some of the conclusions is based also in this analysis. (Wiklund 1995)

We organised with the help of staff in residential houses and day centres four events which we would like to call group discussions. There were 44 aged in these events. Their age mean value was 78 years (57-92) and they functional status, both physique and mental, vary very much. More than half of the group researched were persons living in their own private homes and their functional status were of course much higher than the other part of the group. There were 14 male and 30 female and in general one could say that the women were

more willing to talk in these discussion groups. In three events there were also staff included in discussions. They did not direct or influence the conversation although they told us also their opinions about the system.

For the stuff we organised two group discussion sessions. In these sessions were approximately twenty persons only one being male. Their age varied from twenty to sixty years, majority being over forty years old persons. In these group discussions first we talked about the situation people were at present. Then we show the project's future vision video to give idea of the solution of new technology and robotics in everyday life. After that we discuss about the feelings and opinions based on video.

There has also been several videotelephone usability rounds for elderly users during the project. For the stuff there has been two usability studies in using videotelephone and mobile multimedia equipment called communicator. There has been also possibility for the stuff use videotelephone regularly because two of project's videotelephones are situated in the working offices. Also some elderly users are having videotelephones in their homes at the moment. By this kind of field-study we are getting user-opinions of the system in the natural environment of both workers and inhabitants.

Interface of videotelephone has been modified by user-requirements of elderly people. The latest version of interface has been commented very easy to use and this is also supported by the observations in field-studies. Stuff has also found in the usability-testing and on the whole the interface of videotelephone easy to use. Problems in using the system have been mainly on the software of patient-register-call-system and usability of mobile communicator. Using touchscreen as a main control-instrument has been intuitive and mainly positively commented, but for the long-term-use by workers it needs more studies to ensure it's superiority among other controls.

Attitudes towards new technology in part of everyday life and work varies clearly by different cohorts. Younger cohorts start to use new technology rapidly and for

different kind of purposes. Often latest technology is also more a status symbol for younger persons. One could even say that technological equipment are some kind of ritual instruments for younger cohorts. Taking ritual as a one of a basic needs of society and individual one must consider how new technology can serve elderly people the best way without diminishing their rituals. Also if there are radical changes in life-course, rituals are usually the means which comfort person's living (Imber-Black and Roberts 1993). Ritual, which is basically social phenomena, could be brought out with the help of the new technology if it is not otherwise possible.

Surely there are also differences between genders in attitudes towards new technology. Men have usually dominated in the area of technology because it has been mainly their creation. In the development of technology the voice of women and aged is needed finally because during the last years their opinions have been left out of this process.

People's, both elderly and workers, attitudes towards solutions of new technology depend mainly on the purpose which new equipment are thought to do. If the purpose is pragmatic, the attitudes are mainly positive. Equipment which helps people in their everyday lives and work, are taken as useful tools in homes and institutions. Equipment which can do better things than a person himself or give better feeling of safety and security and are also easy to use, are considered useful. Particularly older people are not very willing to learn new complicated manuals, and therefore it is most important that the equipment and system used by the elderly are specifically designed for them.

The biggest problems or negative attitudes against new technology are found in following matters: price, difficulties in learning new technology, losing human contacts and the difficulties to match new technology to their present environment. Also the fear of losing jobs was commented by workers in the case of applying new technology.

The aged we have met during the research were not in general much against

new technology. However in some cases they could not see themselves as users of new communication and service systems. One reason to this was that particularly the very old people see themselves as a burden to the society, or they see their future perspective limited. Another reason is that some people were not familiar with information technologies and computers. Elderly persons, also in stuff, who have seen their children or grandchildren using new technology were more interested in the system than others.

3. Ethics of concepts

The meaning of quality of life and well being is different for different individuals. In some cases the feeling of security or possibilities to communicate are easily increased with a help of new instruments. These cases are clear proofs of what new technology could mean to one's well being and quality of life. Nevertheless in many cases the influence of new technology goes far beyond one task or one job. We should carefully examine the past, present and future to predict the possible influences of changes in communication or service and interaction mediums.

Fernando Leal (Leal 1996) has presented five possible fears and threats in using new information, communication and automation technology. First fear is loss of skills which means that through new technology jobs are lost or skills of the profession are lost. Automation creates a new kind of dualism, some people get more interesting work for example in designing new systems whereas other people have to perform the unskilled jobs. This dualism is considered to be bad in itself, because it reinforces old or fosters new divisions in society, which are based on differences of class, race or gender. Secondly new communication technologies are said to have paradoxical effect because they either change the actual process of communication or even destroy it. Third fear is loss of privacy by new technology. This means that we are monitored by different kind of means and we don't even probably know that. Fourth threat is loss of control. The

question is who gains the information and who controls it and who controls new technology. Finally we are losing for the reasons mentioned above our sense of self or self-identity.

mmHACS-project has an ethical regulations or code, which will lie behind all acts of the project. Ethical issues concerning the project are divided into two separate sections: ethics of making the actual research and the ethics of product and service concepts. In both sections we have considered both the threats and possibilities in using new technology.

Ethical guidelines of making research define the way research should be done and how the results of the study should be treated. It also concludes the rights of those who are participating on this project. Main paragraphs of the rights are voluntariness, informed consent, confidentiality, privacy and bilateral convention.

Ethics of the concepts are divided in three paragraphs which are requirements of equipment, requirements of services and communication and security of information. Requirements of equipment are as follows: easy to use, reliability of system (there should be back-up systems), moderate-priced, compatibility with other equipment, fit to the environment (esthetical side of the equipment) and system should be easy to modify for different kind of users.

Requirement of the service-system could be defined in following matter. Service-system should increase and not decrease following things: safety and reliability of services, feeling of security, level of activity, social contacts, expressing oneself, getting information, belonging to the community, possibility of choices, influencing and participating, notifying individual and esthetical needs and privacy. Of course the paradox is that you can't get the maximum security and have maximum privacy at the same time. Between things there has to be always compromises.

However ethical perspective grows even more important when we include people who have some disabilities in their later life (e.g. demented person) to the research. Next questions are essential when

there are plans to use the new technology in the care of elderly
(Marshall 1994):

- * Who have access and control to technology - patients, caretakers or relatives?
- * Who benefits mostly from the technology?
- * How voluntary, competent and informed are persons about the technology used in their environment?
- * Is technology being used without knowing the real problems of user?
- * Is technology being used instead of staff?
- * Is technology being used instead of poor design?
- * Is safety more important than privacy?

Using a new technology in services, health care and communication is a challenge especially when it is concerning oldest old persons. Today we are confronting the questions of further more growing population of oldest old and also the breaking of multigenerational family ties. This means that to ensure the security and the quality of one's life, the society must innovate new ways to do things. Things can be done in many ways and this includes also some new technological applications. To build a new system used in near future it is important to interview, discuss and observe people who might be the future users of the system. This way we can be sure that we are getting closer to his/her idea of quality of life and well being and how it could be improved by technology.

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