Review: Roles and Functions of User-oriented Gerontechnology: mStick and hStick

Satu Pekkarinen¹,²  Päivi Kuosmanen²  Helinä Melkas¹  Antti Karisto³
Raisa Valve²  Kari Kempas¹

¹Lahti School of Innovation, Lappeenranta University of Technology, Lappeenranta 53851, Finland
²Palmenia Centre for Continuing Education, University of Helsinki, Helsinki 00310, Finland
³Department of Social Research, University of Helsinki, Helsinki 00100, Finland

Received 5 Sep 2012; Accepted 3 Dec 2012; doi: 10.5405/jmbe.1291

Abstract
This study focuses on the role of user-oriented gerontechnology in elderly care services. The memory and reminiscence stick (mStick) and health stick (hStick) concepts have been developed to increase user involvement in services and to make the service chains smoother, which has been the focus of the health and social policies in many countries. The mStick is a biographical memory store where personal documents, like family photographs, texts, and audio and video clips, are stored. The hStick is used for storing health-related data, needed in the case of emergency or in self care, especially in health promotion. Eighteen pilot cases were investigated throughout their implementation to assess the roles and functions of the sticks. Qualitative data were collected in the years 2010 to 2012 via interviews, learning diaries, photographs, memos, and participatory observation diaries. Qualitative content analysis was conducted. In the analysis, ten roles and functions of the sticks were found at three levels, namely the organizational and societal level, “the meso-level” (relationships between an individual and the social environment), and the individual level. The simplicity and versatility of the sticks has facilitated acceptance of these kinds of concepts.

Keywords: Gerontechnology, Elderly care, Reminiscence, Health promotion, User-driven approach

1. Introduction

New approaches and innovations in the field of elderly care are sought in order to respond to the challenges brought about by the changes in the age structure of the population. A lot of hopes are set on technology, but technology designed for the elderly too often replaces human work, and therefore, also human contact. In recent years, a more customer-oriented approach has been applied in gerontechnology and related health and social policies. Health policies across industrialized countries have sought to promote opportunities for users to be included in novel ways in health care, from treatment decision-making to service evaluation and development, called, for instance, patient-centered care or patient and public involvement (PPI) [1]. Customers are also encouraged to focus on self-care and to take more responsibility for their health [2]. However, misunderstandings occur and a lot of extra work is done because of insufficient knowledge about the customers: their medical history, their life history, as well as their preferences. A problem in promoting smooth customer-centered service processes is that patient information is usually not transferred between service providers [1]. Patient involvement, e.g. access to their health records has been seen a way to improve patients’ relationships with health professionals and their understanding of their health and healthcare. [3,4]. A topical challenge is to combine a human and user-centered approach with the possibilities of technology when developing elderly care.

The field of gerontechnology emphasizes that the environment where older people live includes the social and living environment, but also, essentially, the technological environment. In gerontechnology, a system approach is applied between a human being and her/his technological environment, and the user interface in between. Both the system and the user are dynamic, being in constant change [5]. Despite this slowly growing theoretical understanding, in practice, technology is still often poorly implemented, often as a separate ‘island’ [6]. A central question is: what is achieved with technology and what are its impacts [7]. Technology in elderly care services has an impact on the customers as well as care workers [6].

This paper focuses on the development process of two gerontechnological concepts, the health stick (‘hStick’) and the memory and reminiscence stick (‘mStick’) [8-10]. They are
developed for enhancing the well-being of senior citizens and enriching the quality of care work. The stick concepts are based on existing technology, namely ordinary USB sticks and similar gadgets, which function as devices for information storage.

The mStick is a memory and reminiscence stick that supports memory and tests it. It is a biographical memory store; personal documents, like family photographs, texts, and audio and video clips, as well as materials linked to the owner’s hobbies and interests, are stored on a USB stick. The stick can also be based on ‘generalized memories’ that are related to a certain period of time, or a certain generation. The mStick provides meaningful entertainment to independent elderly people and also those living in residential care or long-term care and suffering from memory and communication problems. Human beings are biographical creatures, and age is seen as cumulative rather than cross-sectional. Knowing about a person’s life history helps to see the older person as a whole human being, not just a patient. The contents of the sticks can be produced, shared, and used either privately or in reminiscence sessions or similar activities.

The hStick (health stick) is a modernized version of the so-called SOS Passport, on which various health-related data may be saved: personal information, blood group, illnesses, vaccinations, medication, living will, etc. It functions as a safety device in the case of acute illnesses or injuries. First and foremost, however, the hStick functions as a means for self care as well as the promotion of one’s own health, because a comprehensive selection of information on health and health behavior are saved on the stick: results of various measurements with reference values; i.e., blood pressure, diaries on exercise, nutrition, sleep, etc. The philosophy behind the hStick is that a human being is interested in her/his own health and well-being. It may stimulate people to monitor and promote their own health more systematically than more limited concepts or tools. Therefore, it may postpone and reduce the need for institutional living and enable people to live at home even in their old age, either independently or with assistance.

The sticks take an interactive and ‘hybrid’ perspective to the smart living concept. From this perspective, smart living is not seen as a question of technology only, for instance, home automation or assistive technology, but rather a combination of service and product [8]. Smartness of homes is not seen to be within a home or in objects taking action on behalf of people, but the smartness is in networks and in interaction [11,12]. From the perspective of the sticks, smart living thus means connecting technologies and services fitting and embedding into real user contexts in a socially sustainable manner. With regard to developments in gerontechnology, the sticks are at their forefront: they represent user-driven, personalized technology that empowers rather than labels; they imply proactive and tailor-made rather than reactive and standardized solutions; and their focus is on quality of life rather than on health alone [8].

The focus of this study is to examine the experiences related to the mStick and hStick. The aim is to investigate the impacts of the sticks by defining the different roles the sticks play in customers and care personnel’s experiences. Another aim is to evaluate the success of the customer participation during the process. The contribution of this study is to concretize what the interactive and hybrid perspective to the smart living concept means in practice, and to give insights into the implementation of the novel concepts in elderly care as well as the impacts of technology. It also gives a basis for rethinking present ways and work methods in elderly care.

2. Methods

The data for the study were collected in eighteen pilot cases that were launched in Lahti Region, Finland, in 2010-2012. All the pilot cases applied, more or less explicitly or implicitly, a Living Lab approach, where the users and other stakeholders (e.g., care workers, social and health care students, and teachers) were equal partners and sources of information in the development process. In a Living Lab, members do not simply participate, but they are actively contributing to the whole innovation process [13].

The pilot cases were examined with an explorative approach and with the Living Lab techniques, where the question is about a process of co-creation of the innovative concepts [13], and collective knowledge creation from different perspectives. The Living Lab approach was considered suitable for this kind of a process where no technology or concept that should be put under test existed, but where the concept is still under development. This creation process is the focus of the study.

The hStick and mStick pilot cases consisted of communities or organizations which represented public, private, and third sectors. The pilot cases were selected at the start-up event, where the idea was presented to health care and elderly care organizations in Lahti Region, Finland. The participants were asked and encouraged to define their actual needs with regard to developing and using the sticks, e.g., whether the mStick or the hStick would be used, and which customer groups they wished to involve. As a result of this, and through the networks of the involved organizations, six hStick pilot cases and 12 mStick pilot cases were launched.

The customers consisted of independently living active seniors who were members of some activity group, older people living in care homes, as well as some special groups, like immigrants. Table 1 briefly describes the pilot cases.

The pilot cases were investigated throughout their implementation to assess the roles and functions of the sticks. Qualitative data were collected from 2010 until early 2012 by means of group interviews and other meetings (47 end users, 42 workers with either management or employee position, or students or teachers), learning diaries, photographs, memos, and participatory observation diaries. As a novel concept was explored, there were no readily available theoretical categories. Instead, the data were analyzed according to the principles of inductive content analysis with open coding, creating categories, and abstraction. The pilot cases were not analyzed as separate cases, but together. The expressions related to the roles and
functions of the sticks in the whole data were coded according to their contents. These content codes were categorized into subcategories, and finally, into the ten main categories that are presented in Section 3. Table 2 shows an example of the coding process and phases of analysis.

Table 1. Pilot cases.

<table>
<thead>
<tr>
<th>Case</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>An hStick for independently living, active seniors</td>
</tr>
<tr>
<td>Case 2</td>
<td>An hStick for customers of a health kiosk</td>
</tr>
<tr>
<td>Case 3</td>
<td>An hStick for home care customers</td>
</tr>
<tr>
<td>Case 4</td>
<td>An hStick for customers of exercise counseling</td>
</tr>
<tr>
<td>Case 5</td>
<td>An hStick for travel agency customers</td>
</tr>
<tr>
<td>Case 6</td>
<td>An hStick for a bank’s employees and customers</td>
</tr>
<tr>
<td>Case 7</td>
<td>A personal mStick for immigrants</td>
</tr>
<tr>
<td>Case 8</td>
<td>A personal mStick for independently living older women</td>
</tr>
<tr>
<td>Case 9</td>
<td>A personal mStick for independently living older people</td>
</tr>
<tr>
<td>Case 10</td>
<td>A personal mStick for Parkinson’s patients</td>
</tr>
<tr>
<td>Case 11</td>
<td>A personal mStick for a group of men with early stages of dementia</td>
</tr>
<tr>
<td>Case 12</td>
<td>A collective mStick about the history and activities of a handicraft hobby group</td>
</tr>
<tr>
<td>Case 13</td>
<td>A personal mStick for the customers of an activity center</td>
</tr>
<tr>
<td>Case 14</td>
<td>A personal mStick for customers of senior residential services</td>
</tr>
<tr>
<td>Case 15</td>
<td>A collective activity mStick for the customers of an activity center</td>
</tr>
<tr>
<td>Case 16</td>
<td>A collective activity mStick for the customers of an activity center</td>
</tr>
<tr>
<td>Case 17</td>
<td>A personal mStick for people with communication problems</td>
</tr>
<tr>
<td>Case 18</td>
<td>An mStick course for older people with basic IT skills</td>
</tr>
</tbody>
</table>

Table 2. An example of how the data were analyzed.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Content</th>
<th>Sub-theme</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>“That was the reason why I got so enthusiastic, as it will be left for the grandchildren.”</td>
<td>It is important that the life stories will be left for future generations</td>
<td>Feeling of continuity</td>
<td>Intergenerational relationships</td>
</tr>
</tbody>
</table>

3. Results

Based on an inductive content analysis of the data, ten categories were found concerning the roles and functions of the sticks. They are located at different levels: the first three categories are located at the organizational or societal level; the following three categories describe the relationships between an individual and the wider community (the meso-level) and the last four categories describe the individual-level impacts of the sticks. The categories are presented below.

3.1 A critical information package

The hStick contains the basic health information needed in case of an acute illness or emergency, when the person may not be able to express himself, or when the identity of the person is uncertain. The hStick may facilitate the flows of information at the interfaces of different organizations:

In the worst case, if a private doctor has prescribed medicine X, and the older person with dementia doesn’t remember that, the information should be on the stick. If another doctor prescribes medicine Y which is incompatible with medicine X, it may cause a dangerous situation (a home care instructor, an hStick case).

The hStick has also proven to be useful when travelling abroad, for instance, in cases of language problems between the patient and doctor.

3.2 Care work support and renewing the caring culture

The role of the mStick is not as a replacement of human workforce in care work, but rather as an enrichment of the work. The benefits are especially great if a person has communication problems which easily lead to misunderstanding.

This is great—here you can really see that this person likes her hair rollers into her hair after the sauna or shower. When you concretely see it, you’ll remember it better (a nurse who was shown the mStick of an elderly woman).

The mStick enables care workers to see the patient as a holistic creature with a biography and a past. It facilitates communication between patients and the care personnel—if names of the relatives are saved on the photographs, for instance.

A resident may not remember the names of relatives or mother or sisters, for example, so if the names have been recorded here, the care worker can utilize them-see, here is Elma (a student, an mStick case).

Even though holistic care is desirable, the way in which healthcare professionals often talk reveals that basic work consists only of medical and practical treatments. Good experiences were found when social and health care students worked as ‘stick tailors’; they found the work very inspiring and useful. The students of health care and their teachers emphasized that stick tailoring and the related biographical approach as part of studies and curricula is an important step towards a change in job descriptions and the care culture. The tailoring of sticks is a job that requires not only information technology (IT) and information-related skills but also a humanistic approach, gerontological knowledge, and social skills. The use of the mStick is a step towards holistic care, where a person is seen as an entity, not just a patient with certain illnesses.

In this way we get to know something very essential about the resident. The life history is very important. It is related to the autonomy of the person, which is an essential part of the care work (a service manager).

There seems to be potential for a cultural change in care practices, highlighting the need for a biographical approach in care work, where getting to know the customer more deeply is not felt as extra work but as an internal part of basic care. The mSticks are concrete tools for applying this kind of holistic approach. A biographical approach may also raise social appreciation of elderly-care work.

The stick can also act as a kind of tool and service product for care workers organizing reminiscence sessions and other joint programmes. The sticks that are produced within one reminiscence group can be shared and used also in some other group, if appropriate. For instance, a group of seniors from an activity center visited a sheep farm, and then participated in the whole process of producing a sweater in the traditional way from wool with several phases (dyeing, spinning, knitting, etc.). In many of the participants, having experiences of living in an agricultural society, memories were evoked from past decades. Visits and conversations were videotaped. The material will be
used in several senior activity centers as part of activity programmes and reminiscence sessions. This is an example of a recreational activity which could be done without an mStick, but, at the same time, it is an example of why it is useful to store these activities on the stick. By storing the materials, these generational memories can easily be shared, and they also reach people who are not capable to go to the sheep farm and spin and knit themselves.

### 3.3 Information society for all

The sticks promote older people’s inclusion in e-services and the information society in a personally touching and meaningful way: utilizing older persons’ resources and by increasing human interaction. [9,10]. The sticks have increased older people’s and care workers’ interest towards new technology. The care workers’ IT skills have developed, and some of the elderly participants have even bought a laptop or some other piece of technology, like a digital photo frame, as they got enthusiastic about the digital life stories.

I have noticed that the fear towards technology has already turned to curiosity (a service consultant, an mStick case).

I hadn’t seen such a stick before. Well, that was... that was a miracle. (a customer, an mStick case)

When developing the mStick, the starting point has been reminiscence, not the technology, but the participants have been curious and also astonished about the possibilities of this ‘little piece of technology’ to store and present the life story in many formats-sounds, photographs, and video.

The mStick offers opportunities for lifelong learning. Preserving the life story and other biographical documents in a digital form and utilizing opportunities offered by IT have evoked a new kind of interest to learn computer skills among older people. The care sector educational organizations have taken an interest in the matter too. One of the case organizations, an adult education center, is arranging a ‘stick course’ for seniors. In this course, the aim is to build illustrated digital life stories and simultaneously to learn IT skills in a personally meaningful way.

The sticks provide an “information society for all” because age cohorts who are not used to using IT may participate. Technology is invisible, and for users, IT skills are not necessarily required. As an example of this, in the cases, there were easy-to-use solutions for presenting the materials, such as digital photo frames and televisions with USB ports.

### 3.4 Empowerment

An important factor related to an individual’s relationships with society is how the mStick makes a person visible and appreciated in her or his social environment.

It is so wonderful that my life and work history have been noticed in this way and I feel that they are appreciated. This is like an award for my life work! (a customer, an mStick case).

The mStick may highlight the user’s uniqueness and prevent facelessness in an institutional setting. People living in institutions can acquire the status of a recognized individual, not only that of a patient, in the eyes of care personnel and other patients, if excerpts of their biographies are presented in joint recreation sessions or similar activities.

This illness (dementia) makes you somehow more blank, and if at this stage the customer is ‘faceless’, there are many things that the nurse doesn’t understand. But if the customer has a face and a past, he or she is a person and can be regarded in the right way (the responsible nurse of a dementia unit, an mStick case).

The hStick, too, has essentially to do with empowerment in health-related issues: what people could do themselves for their health and how they could prevent problems. Health and social care personnel benefit by acquiring more reliable anamnesis information and a real picture of what a customer has done for his health. The idea of the hStick was actually invented by a retiree who actively participates in a Living Lab group where it was developed. The motivation for him and other co-developers was that an elderly person would take more responsibility for her/his own health. The stick gathers personal health-related information in one concrete place because official health care information systems do not communicate with each other. His experiences about presenting the stick in a health center has been that doctors are not willing to insert the stick in their computers because of fear of viruses, but the idea of having all the essential documents carried by the patient was warmly welcomed by the doctors, because it would help to form a holistic picture of the person’s health.

### 3.5 Medium of communication

The mStick may function as an instrument for telling about one’s background. It offers an instrument to immigrants, who may have problems in getting heard in the society, for telling about their background and storing the official documents needed in the complex process of integration.

The mStick may function as an instrument to express oneself and tell about one’s life and wishes, even if a person is not able to speak. Tools for this are being planned in one case organization. The mStick also helps the communication of those who have memory problems, functioning as a memory support. A group of men suffering from early stages of dementia, together with their group leader, planned the contents of their mStick, with the aim of telling what things are important to them and what they wish when the disease progresses. In acute incidents, the hStick may help to communicate about one’s health condition, when the person has memory or communication problems.

In the woods of our summer cottage I was thinking that “what if something would happen to me here, and I had to be taken into the local hospital. How would the personnel get all the necessary information, if I was not able to speak?” From this point, the thought came to me that a USB stick is a device that could be easily carried (initiator of the idea of the hStick in the Living Lab Group).

### 3.6 Intergenerational relationships

An important factor is that the stick does not replace but rather promotes and enriches human contact and mutual communication. The mStick may build a bridge between...
generations by enhancing intra- and inter-generational interaction and communication.

I have told my own daughter quite a lot about my childhood, but my daughter’s son is only a year and a half, so I am wondering how long I will be here to tell him and I remember who I am. From this viewpoint, the stick seems important (a customer, an mStick case).

One of the participants in the mStick case mentioned that the main reason for why she participated was because she wanted to save the stick for future generations.

That was the reason why I got so enthusiastic, as it will be left for the grandchildren (a customer, an mStick case).

The elderly felt that the stick would help them to “stay alive” in the consciousness and memories of future generations. An old lady (over 80 years old) wanted to record her greetings to her great-grandchildren:

So now this whole life of mine is there on one tape, and then at the end, I gave my regards to that fourth generation-of them, tomorrow, the fifth of the fourth generation turns one year old. So this is left for them, the bigger ones remember me all right, but these little ones will not remember me anymore, so they will see from photos what the grand-grandmother was like and she even gave her regards to them-so that’s a nice thought (a customer, an mStick case).

With the mStick, it is possible to create ‘generational intelligence’ [14], an ability to put oneself in the position of other age groups. The stick offers a possibility to collect generational memories.

The children of that time, compared to the children of today, didn’t play but they got responsibility for the tasks that they were given because they knew that there was no option. That was how I felt (a customer, an mStick case).

Society is changing rapidly, and, for example, stories concerning the everyday rural life a few decades ago are regarded as very important to understand the change.

3.7 Interest in health promotion

At the individual level, storing health-related materials to the hStick (having it all in one package) has been felt to build coherence from the perspective of health, despite the suspicions in the health center concerning the information security related to USB sticks.

Nine years ago I got seriously ill, and I have been having controls and blood tests since then. A couple of weeks ago, when I went to the health centre, I asked them to save the results on the stick, but they refused. I got the results on paper, and I compared the results to the old results. It would be nice if these results were on the stick, maybe to have some graphs of them. It is important to me that I’m aware of my health history (a customer, an hStick case).

The main motivation factor among the elderly people to participate in the development work of the hStick was the willingness to live actively in later life, and to take care of one’s health.

Cars have a service manual, so why don’t human beings? (a customer, an hStick case).

After storing information to the hStick, I got a better picture of my health condition (a customer, an hStick case).

The hStick may also act as a rehabilitation-supporting device, including tailor-made instructions in an illustrated, easy-to-understand way, for example a video on how to get out of bed after hip surgery.

3.8 Memory support

When producing contents for the mStick, one of its functions is the memory exercise function. The simple process of selecting photographs with an elderly person to be stored on the stick may serve as a memory exercise in itself:

Yes, it became a true memory exercise, when we went through these photos and what happened and when (a customer, an mStick case).

In the process of developing the mStick, the cumulative nature of reminiscence was used. One piece of memory provokes several other memories. For instance, when the contents of the personal mStick were shown to a woman with a memory disease, she told more and more and filled the gaps in her life story, as she remembered new things all the time because of the photographs. Sometimes the photo series had to be shown several times before the names of the people in the photographs came to the person’s mind, but when the effort was rewarded, it was an extremely empowering experience.

On the other hand, it was quite time-consuming and sometimes also a little frustrating to work with persons who had memory problems, because the reminiscence work had to be started over again in each session:

The issue has to be introduced each time. You just cannot enter with the folders and the laptop, and just say “let’s continue from where we finished last time” (a student, an mStick case).

3.9 Feeling of coherence in life

The reminiscence work, which is to be done in the process of constructing the mStick, is felt to function as part of a person’s identity work, helping to build a feeling of coherence in life:

Writing the life story helps you find something that maybe indicates that the chosen direction has been a good choice and you can accept the decisions you have made (a customer, an mStick case).

Reminiscence helps to build bridges between the past and the present. Therefore ‘living in the past’ should not be regarded as regression, but as a crucial part of human essence as a biographical creature and as a way to build one’s identity. Memories are an important resource for an older person. Elderly people can perform meaningful ‘identity work’ or accomplish ‘mature imagination’ [15] by reflecting their biographies. Identity work is an everlasting task for a human being, according to modern identity theories [16,17].

3.10 Meaningful entertainment

For the ageing people who participated in the cases, participation was felt as meaningful entertainment and a precious life experience. People have experienced that both the reminiscence and the preserving of memories have brought
novel contents to their lives, the importance of which should not be underestimated.

The reminiscence and storing of the memories as well as social participation during the work method were activating in other ways too.

*It has been fun to share memories with outsiders, as there have been some unusual incidents in my life* (a customer, an mStick case).

*Also my children have noticed that now this grandpa has got some new power* (a customer, an mStick case).

According to the data, looking back at childhood memories has also brought joy to life after widowing and has relieved feeling of loneliness.

4. Discussion

How did the customer participation succeed? Plenty of information was acquired about the process of compiling the contents of the sticks. The experiences were positive in many ways, even though in the beginning, many of the elderly people were a little suspicious about new technology and this kind of working method, which was unfamiliar to them. In the end, however, most of them got the feeling that it was more than worthwhile to jump into the unknown, and they even expressed their thankfulness of the participation in many ways. The care workers regarded the mStick as a useful tool in their work and were willing to develop it further in order to implement and adapt it as a permanent practice in their organizations, which would be the desirable end-result of the project. These solutions have ‘a taste of life’, which has made the idea relatively easily accepted and implemented. As the ratio between the mStick and hStick pilot cases launched shows, the mStick seems to have a clearer social demand because of its more straightforward implementation and having less to do with information security issues.

The systemic nature of technology; technology as part of its context-its relationships with users and the service system-is often forgotten in elderly care [18,19]. Smart homes equipped with technology should be real homes [8], where people can live their normal lives. In this study, the case organizations were asked to construct the sticks in order to respond to the needs of the specific organization and its customers. This practice-based and “real life” approach surely contributed to the finding of innovative and practical solutions, like the use of the digital photo frame instead of a computer, in the case.

Some suspicions and barriers have naturally come along. Concerning the hStick, fears of viruses and worries about information security have emerged. The results show that the hStick can be accepted easily and adopted when it functions as a means for monitoring one’s own health, learning self-care, and giving feedback. It may be utilized in storing health information and also in e-services with health care professionals. As to the mStick, it takes time to collect and store the materials on the stick, especially with people suffering from memory diseases. Some active seniors may be able to do it themselves, either independently or in courses and groups, but in most cases, some extra help is needed. The role of close relatives may be crucial here.

The questions of when and how to produce an mStick also have to be considered individually in different situations. For instance, for some persons, it may be inconvenient to do the reminiscence work when she or he is moving from home to a dementia unit, for instance, because the current life situation may be stressing and confusing. In this case, an option could be to use generalized reminiscence materials instead of personal materials. For some other persons, however, looking into the past may build integrative bridges in the phase of change.

Technology-related problems were encountered. Even though the stick is rather simple (sometimes regarded as too simple) technology, its idea may be difficult to understand for persons not familiar with computers, and it may be confused with the internet, for example. Some of the care workers who assisted in producing materials for the sticks also mentioned that, because of their inadequate IT skills, the work has been quite time-consuming. The stick, however, is easier to understand than the alternative of storing personal information in a cloud-based system. Sticks are understandable and rich in semiotic sense. They can, for instance, be designed and personalized, if so desired. Computers are not necessarily needed when using an mStick. Televisions with USB ports may be used as mStick platforms if computers are not available or if they are felt to be aversive. A practical, simple platform is a digital photo frame, which is rather cheap.

However, the concept does not imply that the USB sticks are the only possible type of technology for this purpose; future technological platforms may well be different. The emphasis is not on physical artefacts as such, but on the know-how and ‘gerontological imagination’ related to them [8].

5. Conclusion

The roles and functions of the mStick and the hStick were determined in this study. The organizational and societal level implications concerning the mStick and hStick were a critical information package, care work support and renewing the caring culture, and information society for all. The relationships between an individual and the social environment (the meso-level) were categorized in terms of empowerment, intergenerational relationships, and medium of communication. The individual-level implications concerning the sticks were feeling of coherence in life, interest in health promotion, memory support, and meaningful entertainment.

The experiences gained in the pilot cases have mainly been encouraging. The main reason for why the stick has been so easily accepted lies in its simplicity and versatility. The mStick for preserving personal memories has been broadened to store also collective memories and different kinds of activities as well as wishes concerning every-day life and preferences concerning care activities.

So far, the experiences mainly concern the development phase of the sticks: thinking about the structure, choosing the materials, and producing and storing them on the stick. The concept itself is still under development, and results concerning
the long-term use of the sticks are forthcoming.

Acknowledgments

The authors wish to thank the European Regional Development Fund and the Regional Council of Päijät-Häme for the opportunity of presenting their research in this journal.

References