A TV Platform to improve older people's quality of life: Lessons learned from the evaluation of the VITAL project with Spanish Elderly Users

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ABSTRACT

The User Centered Design allows the technical developers to know specific characteristics about the potential end users. In the specific case of elderly users, consideration of their needs in areas like communication, family and social relationships, social support and leisure, is a key point, which should guide the development of technological applications. The sample recruited for the last evaluation of VITAL in Spain was composed of 83 participants, 19 male and 64 female, with an age ranging from 52 to 91 (x=73,68, sd=7,86). All targeted users were attending elder associations in their respective cities, which implies an existing minimum social interaction for all for them. This paper gathers the literature about elderly needs in the areas of communication with family, social relationships and leisure, and examines what elderly users think about how VITAL Platform can help them in improving their quality of life in those addressed areas.

Categories and Subject Descriptors

H.5.2 [**Information Interfaces and Presentation**], D.2.2 [**D.2 Software Engineering**], H.1.2 [**Models and Principles**]; J.7 [**Computers in other Systems**].

General Terms

Documentation, Performance, Design, Reliability, Experimentation, Human Factors.

Keywords

VITAL, Elderly, iTV, Accessible TV, User-Centered Design.

1. INTRODUCTION

Ageing process is developed in a context where beliefs, personal values, attitudes, thoughts, etc. have a strong influence on people's behavior and adaptation processes. The most relevant psychological conditions in the elderly are the need to be listened, the feeling of loneliness and the lack of social roles, isolation, the lack of adaptation and/or the fear to retirement, and the concern about personal loss of relatives and friends [1]. On the contrary, social issues such as social communication needs, architectonic barriers and family dynamics must be taken into account. A study with a sample of 854 people older than 50 in the United Kingdom [2], found that for the elderly it is of relevance, the preservation of a good health and functioning, but linked to other needs, such as personal gains, financial security, living in a good neighborhood and still contributing to life (including volunteering activities).

In an attempt to fulfill to some extent this range of needs, the VITAL project, which is a European Community 6th Framework Program financed project, has developed a set of technologies, platforms and applications with the aim to provide remote assistance to elderly users and increase their quality of life, considering important demands such as the need for information, communication, entertainment, self-education, etc.

One of the main strengths of VITAL project is the consideration of elderly people's social needs, and their view about what successful aging means for them. In other words, the VITAL project follows a User Centered Design, a view that allows the technical developers to be in touch with the end users (i.e. elderly people), with their opinions, attitudes and values, in order to create a technology which keeps in mind the end users (versus a product centered design, which develops the possibilities of the latest technology to a limit that may be too much complicated when faced with the technological abilities of the potential end users).

In this paper, we will introduce the needs identified in the literature in the areas of communication with family, social relationships and leisure, and examine what elderly users think about how VITAL Platform can help them in improving their quality of life in those addressed areas.

2. BACKGROUND. ELDERLY USERS: COMMUNICATION WITH FAMILY, FRIENDS AND LEISURE

Ageing transforms the role of an individual person within his/her family environment. Within the family, there seems to be an agreement on the fact that the existence of a high amount of social contacts with plenty of affective content, contributes in a high extent to the happiness of elderly people [3]. Some researchers have argued that elderly people with low indexes of social support report a higher presence of negative affects, a greater level of loneliness, more depression and less satisfaction with life [4]. To some extent, visits to friends and relatives, or the reception of phone calls, for example, are very useful in order to reinforce social support networks and to facilitate familial and social integration [3]. Despite a daily face-to-face contact, the sense of perceived support from the family, and the continuation of a fluid communication with them, constitutes a decisive resource against loneliness and in favor of health maintenance. In terms of friends, it is a unique kind of relation, because it is the person itself who chooses his/her friends; the sense of control over the choice of friends can be especially relevant for the elderly, since they feel that they can lose control over other areas in their lives. According to a meta-analysis of 286 studies of subjective wellbeing in the elderly, [5], frequency of contacts with friends (i.e. quantity) was the most important factor, while intimacy (i.e. quality of contacts) was the main factor in family relationships.

In terms of leisure, any option of leisure that is brought up for this population must be open to the fact that elderly people need to gain control over the way and the activities they want to use their leisure time for. Research in this area has shown that the perception of not having control over their lives and environment may have serious physical and psychological impacts over the wellbeing of the elderly. Thus, studies show that elderly people perceiving themselves as having relevant activities under control may age in a more satisfactory way (with a decrease of mortality, morbidity and physical disability), than those feeling unable to control their environment [6].

Figure 1 VITAL Main Menu

After having described some of the relevant literature on elderly users' needs for the communication and leisure areas, the following section will describe the VITAL Platform in its final stage, which will allow the reader a better understanding of the platform being evaluated.

3. BRIEF DESCRIPTION OF THE VITAL PLATFORM

From the perspective of VITAL project, communication can take many forms: a videoconferencing with a relative or friend, a chess game with a colleague or simply sharing a cooking receipt with a foreigner. VITAL provides a TV set with a simple remote control to access to the following catalogue of services:
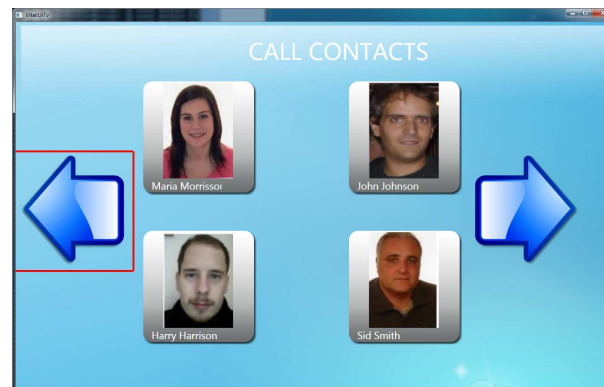

Figure 2 Videoconference Application – Contacts screen

Videoconferencing Service: offers to the end users an on-line two-way point to point communication with a remote person; i.e. other users, family, friends or social services. TV and remote control are the interface, and Ekiga is the underlying open-source software running in this application.

Figure 3 – Quiz Categories

Peer-to-peer gaming: VITAL offers a number of gaming titles for the use by the elderly in the TV environment. The basic idea is that the user must find somebody to play with and must share with him the gaming experience. The system includes classic games such as the chess game as well as less traditional ones such as the Quiz games. The user may request the help of the "friends' searcher" functionality for this purpose. A game can be also suggested by the system automatically. The objective is to entertain and encourage social contact with other users.

Audio books: VITAL empowers elderly users to get access to audio books from the TV interface. A simple user interface allows the elderly user to select a book and the system will read it for her. Reading sessions can be interrupted at any time and restarted at a later point in time, from the point it was suspended. The audio contents can be downloaded dynamically from a server on demand. Books are organized in chapters respecting the usual content division in the original book. The application also helps elderly users to overcome the physical barrier associated to short-sighting.
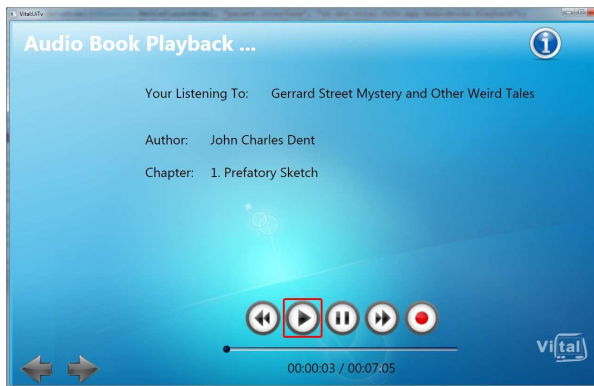

Figure 4 – Audio Books

Information Service and Personal Newspaper: it is an intelligent personal assistant, being its mission to provide improved access to information present on the Internet, for people who do not have computer skills or are reluctant to use computers. The main objective of this application is to ease the access to the information present in the Web, by designing a very simple browsing tool and by providing the means to personalize the information topics, so that the long searching sessions that the traditional web browsers typically require, are avoided.
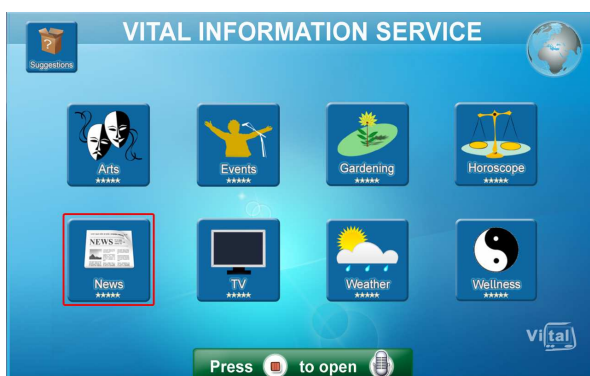

Figure 5 – Information Service – Main Menu

Ideas and Courses: VITAL provides a tele-education platform, which allows the presentation of multimedia courses specifically designed for the elderly: cooking, household activities, etc. As opposed to existing practice in the iTV world, the platform is generic and will allow the presentation of multiple titles within the same application. The client application consists of a sort of multimedia blackboard that can be commanded using the remote controller and that supports resizable fonts according to the user

preferences, and provides the option of having the text with audio feedback. This application lacked contents in Spanish at the Final Evaluation, so it was not evaluated in Spain.

Figure 6 – Ideas and Courses. Categories (English version)

4. EVALUATION METHODOLOGY

4.1 Participants

The sample recruited for the final evaluation of VITAL platform was composed of 83 participants, 19 male and 64 female, with an age ranging from 52 to 91 (x=73,68, sd=7,86) from the cities of Zarautz and San Sebastian, in the North of Spain. All the users were attending elder associations in their respective cities. They had been living in their current location a mean of 46.88 years (sd=18.40), which identifies them as stable participants in their respective communities. Only 31.1% had no studies, while 45.9% had completed primary studies, 8.2% secondary studies, 11.5% had technical studies and a small 3.3% had completed university studies. They had been active workers throughout their lives, with a mean working life of 36.21 years (sd=13.03). 44.2% of the people from the sample were married, while 45.5% were widows.

4.2 Instruments and procedures

Two laptops with two Weemotes (simplified remote control), and their corresponding signal receptors were set in a room where the demonstration would take place on a group basis, connecting the main computer with the VITAL Platform to a slide projector. Two staff members from INGEMA (one evaluator and one observer) explained the whole procedure to the users in each testing site, gathered as a group in the room. They were administered a consent form, thus showing their acceptance to participate in the evaluation session. Afterwards, they were given the VITAL Questionnaire, which included the following sections: 1) sociodemographical data; 2) quality of family and social contacts; 3) leisure activities; 4) satisfaction with life, and 5) Specific evaluation of VITAL Platform services (here, questions about the system in general and individual applications in particular were asked).

After an approximate time of 30 minutes to fulfill sections 1 to 4 from the questionnaire, the main menu of VITAL was presented, and a brief explanation of its usage was given to the participants. Users were required to give written answers to questions related to the main menu, as well as to provide specific verbal feedback to what they were seeing on the screen, asking for consultations or doubts to the staff at any time. The same procedure was followed for each application (from videoconference to broadcast news),

thus showing the interface and the functioning (via Weemote) of each application. After all the services were presented, users were asked to discuss aloud any additional comments or feedback they would like to add. Then, the questionnaires were collected and users were thanked for their participation.

5. RESULTS

Next, the participants' opinions in relation to the VITAL Questionnaire are summarized.

5.1 Results for quality of family and social contacts, leisure and SWLS

5.1.1 Quality of family contacts

Most of the users stated that they could either easily (35.3%) or very easily (52.9%) meet their relatives face to face. 53.1% of the sample had them at a walking distance, while the rest needed either urban (15.6%) or interurban transportation (25%) to go and meet them, and a small percentage (6.3%) needed more than one day to do the distance between them and their relatives. Those living married rated their relationship with their couples from good (32.8%), to very good (23.9%) or to excellent (29.9%). Up to half of the sample visited relatives once a week or more for daily life activities, while more structured activities (trips, holidays, other planned leisure activities) appeared to be less frequent (only 24.6% performed them once a week or more). A great part of the sample (69.2%) felt happy because they could meet their relatives as many times as they wanted. Only 6.2% felt bad because they did not receive visits from them very often. 52.3% of the sample spoke to them by phone once a day or more, while the rest did it from once to twice a week (there were only 3 persons never talking to relatives by phone).

5.1.2 Quality of the social relationship

79.4% of the sample organized their social life outside home, and a little higher percentage (81.8%) met different people that were not their relatives once a week or more. Up to 76.7% of the sample had at least 3 friends with whom they felt confident enough to visit them at their homes

The frequency of speaking to friends by phone was once a week for 41.7% of the sample, followed by 30% who spoke once a day or more, and 26.7% who spoke less than once a week (only one person did not speak to any friend). 43.6% of the sample received visits from friends once a week, while half of those (21.8%) received them twice a week. Only 22.2.% felt confident enough in the idea that they would have somebody available as long as needed in case of feeling ill or disabled, reporting not very strong ties with relatives and friends in case of need. However, a majority (68.3%) considered that they had at least five real friends, and 72.6% reported having made more than five new friends after retirement.

In comparison to when they were younger, the opinion of the sample about their social relationships was divided. 43.9% thought they were quite similar, while 47.4% considered they were either slightly or significantly better. A great part of the sample performed activities outside home (57.1%), while the others performed mainly active tasks at home (31.7%), like reading or craftwork. 61.8% of the sample met people at more structured places, but 36.4% of the sample just went out on the street and met people "there and then").

A great majority (87.2%) is fine with the time they have to meet people they know, and 88.9% would appreciate the involvement of technology in their lives to improve contact with people they know. More specifically, the most desired ways to communicate would be by phone (76.5% use it); only 6.7% would use videoconference; email would be used by 8.9% of the sample, and SMS by 2.2%. Hence, we are facing a priori a very none technologically oriented sample.

5.1.3 Leisure activities

Half of the people from the sample (51.1%) were fine with their leisure time, while 28.9% would like to have more and 8.9% reported not having any leisure time. Divided their time in different activities, the following frequencies were reported, showing a great heterogeneity in leisure habits. The most frequently performed leisure activities were cooking (66.7% of the sample did it often), listening to music (56.1%), physical activity (52.2%), watching TV (51.1% of the sample), watching films (51.1%), reading newspapers (50.1%), and travelling (39.2%). In terms of leisure related to technology, 81.8% have never used email, 83.7% never used social networks, and 84.1% have never played PC or console videogames before.

5.1.4 Satisfaction with Life Scale (SWLS)

In the SWLS scale, ranging from 5 to 35, the sample ranged from 11 to 35 points (x=26.40; sd=5.92); in general, though some people showed a slight disappointment with their lives, it can be said that this was a sample of users quite satisfied with the way they had lived their lives, and would not make significant changes if they had the possibility to do it.

5.2 Results for VITAL Platform and individual services

5.2.1 Overall impression about the system and main menu

The opinions were very divided among those not having a clear statement, those thinking that it was a good application, and those reporting from the beginning that "*this application may isolate people… it might make them isolate at their homes*". However, a majority of 68% thought it would be helpful in improving their social relationships, 72% thought it would help them to keep closer contact to their relatives, 75% thought it would help them to get closer with friends and 83.3% were confident in the idea that it would improve their quality of life.

5.2.2 Videoconference Service

The layout of the videoconference was described as pleasant by 45.7% of the sample (45.7% said it was neutral, neither pleasant nor unpleasant). When they saw the way it worked on the demonstration session, 86.4% thought it was a useful application, and 43.4% would regularly use it (the others would rather continue with the regular phone). 62.5% would use it to talk to family, and 31.3% to both family and friends. It was a very well rated application ("it helps you keep in touch easier… it brings you closer to your relatives… in this way, I can see them"). Among the features they would criticize, they said that "*it may be difficult for older people, it can be confusing for them… it may prevent you from going out*". Again, the fear of losing autonomy and control over the environment, as has been reported in the literature [6], was an issue raised up by the elderly.

5.2.3 Quiz

The layout was rated as neutral and pleasant by the same percentage of people (43.5% each). After being shown how it worked, 88.9% of the sample thought it was very useful, and 87.5% would use it regularly. They would not change anything on it. "*Challenging*" and "*useful*" were the main reported descriptors of this application.

5.2.4 Audio books

65.2% of the sample described the layout of the audio books as pleasant. When being shown the way it worked, the whole sample thought it was a very useful application, and 87.5% reported that they would use it on a regular basis. Among the reasons they liked it, they said "*you can listen to this and stayed relaxed… it gives you another option for accessing culture… they are very practical*". In terms of dislikes, some participants stated it "*might be hard for older people… it may isolate you…*"

5.2.5 Information Service

62.5% described the layout as pleasant. After being exposed to its use, 100% considered it was useful, but only half of them would use it regularly. Many stated that they would continue with regular newspaper, and this kind of technologies may be good "*for younger people*". Some complained that the layout contrast was no good and that fonts should be made bigger, but they were told that this may be adjusted when using it on a TV set (a feature not shown in the demonstration session).

5.2.6 Personal Newspaper

Half of the sample described the layout as pleasant but argued that the lack of pictures and the sole appearance of text in the screen made it boring and difficult to follow the lines through the text. For this reason, most of them would rather continue using a regular newspaper (and the more technologically oriented ones, which were not many in the Spanish sample, would use internet newspapers).

6. CONCLUSIONS

Overall the VITAL platform was viewed favorably and users agreed that it could make a difference to the quality of a person's life. However, most of the people were not very technologically oriented:

"*This is not for me… maybe for younger people*".

And many of them were insisting in the following idea:

"*An application like this may isolate people in their homes even more…*"

In a previous paper for the ISG Conference in Vancouver, Canada [7] based on the initial evaluations of VITAL project, it was confirmed that:

(1) *Elderly users do not want a technological device to do a specific task if it takes long to learn how to use it than continuing doing it as usual*. This principle may explain the reason why there were such discrepancies between those considering the Information Service useful (100%) and those who would actually be willing to use it regularly (50%). The appearance of the Personal Newspaper was not either considered an advantage over a regular newspaper. On the contrary, the regular use of audio books and quiz is supported by 87.5% of the sample. Why this difference? Maybe the novelty and the added value of these applications for people with sight problems provides more ingredients for a greater engagement than the regular books (for which you need appropriate reading conditions in terms of light, lack of noise and ability to maintain visual attention) or regular quiz games (for which usually more people are needed to be physically present in order to play).

(2) *Elderly users would like to have new applications integrated in those devices they already know and which they naturally use in their daily lives*; in this sense, the integration of VITAL on a TV set with a simple remote control has provided support to the services integrated in the Platform, while other features like the Tourist Audio Guide Service presented in PETRA 2010 [8], which finally was not integrated on the VITAL TV Platform, may not have such an optimistic expectation of success among the elderly due to the need of buying specific cell phones.

(3) *Elderly users do not want devices that perform tasks that make them feel dependent upon technology*. This may explain some of the answers given to the audio books, in terms of "*fear of isolation*". If a service is thought to be a substitution of a regular task (as audio books may be thought to be substitutes of regular books for people who are losing sight), it is possible that its acceptance is less welcome as if it is considered a complementary alternative. In other words, if users consider that the audio books are the solution for people with sight problems, they will be less accepted than if they are presented as an alternative to read books in a different way (i.e. people reading regular books can listen to audio books when they are tired, when they go in the public transportation by means of an mp3, etc.). Of course, this is just a speculation that would require further research.

In summary, the main conclusion that can be extracted is that, for many users, the VITAL was a good idea but they were reluctant of describing themselves as target users for such an application. Moreover, it was felt that the VITAL platform needed more development, and that the layout was completely conditioned by the TV set you may have at home: "*depending on the size of the TV set you have, you don't read the words*". For example, Personal Newspaper was described as "*difficult to follow on a TV screen*".

Unfortunately, there was no room for assessing the whole system in Spanish (Ideas and Courses lacked of Spanish contents), and there would be a need for continuous usage of VITAL for a certain period of time under controlled conditions (i.e. home trials with specification of minimum daily usage per application) to actually verify whether a system like this could actually improve older users' quality of life.

However, the potential of the VITAL Platform was very positively appreciated by most of the users who thought this could be a good option for their future if they happened to be less active and a service that could improve their quality of life and social relationships in case of need, maybe not right now that they were still active, but possibly in a few years

7. ACKNOWLEDGMENTS

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