

CAN WE IMPROVE THE ACCEPTANCE OF E-HEALTHCARE SERVICES BY ELDERLY PEOPLE?

Mariona Estrada, Raquel Navarro-Prieto
Fundació Barcelona Media, Innovation Center, Spain

Elena Parra, Angélica Ñañez
Fundació Barcelona Media, Innovation Center, Spain

Keywords: Elderly people, e-Healthcare services, User Centred Design, Social aspects, Cognitive and psychomotor aspects.

Abstract: The goal of this position paper is to provide a methodological framework for the development of healthcare information and communication technologies for elderly people. This methodological approach is based on three complementary areas: user centred design; variables in the e-healthcare acceptance by elderly people (social, cognitive and psychomotor aspects); and the methodologies that will allow us to gather critical knowledge about all these aspects. In order to gather information about all these aspects we need to use a multidisciplinary approach that will bring together observational studies about user requirements in real context; experimental methodologies that will gather the impact of psychomotor and cognitive aspects that are relevant to elderly people; and technology specialists that will provide input about ideal technological solutions for the needs of this specific group.

1 INTRODUCTION

Many studies have found evidences about how e-healthcare services (electronic medical reports, home telecare, virtual communities and networks of social support, etc.) can be very helpful and positive for elderly people quality of life. Unfortunately, also many studies have shown that the use of ICT by elderly people is still very low in most of the European countries.

In this field there are still many open questions: What are the specific needs of the elderly people concerning healthcare new technologies? Are these technologies adapted to their needs? How can we create personalized e-healthcare systems that allow both security and autonomy for elderly people? And, regarding their autonomy, how we can improve the cross-platform interaction (computers, digital TV, mobile devices, etc.) and the way the users can interact within them?

Previous research has studied very specific applications in specific contexts and therefore at present we do not have a comprehensive view of how to increase elders' acceptance of ICT services.

Recently, some researchers (Harper et al., 2009) had shown the impact of social variables in the acceptance by elderly people of the ICT: how the age or the retirement are crucial factors to understand the use of ICT, for instance. But we need to include also the cognitive and psychomotor aspects of this target group that affect the use and acceptance of the e-healthcare tools.

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2 BACKGROUND

2.1 Elderly People and ICT Use

The incursion of the new ICT in many aspects of our lives has changed the way we work, communicate or take care of our health among a lot of other things. In this paper we will focus only in those processes that affect the interaction between technologically mediated healthcare tools and elderly people.

Nowadays, most of the information about health (medicine, social care, etc) is provided electronically. In this sense, it's very important to guaranty the full access of elderly people to their health information.

Social care is also very important for this group, especially for elderly people with chronically diseases or mobility diseases. Through the new technologies they can keep the contact to their relatives, to health assistance or to virtual communities and networks of social support.

Nevertheless, the age is still an important factor to determine the use of ICT tools in general and e-healthcare tools in particular. For instance, in 2007 in Spain 92% of the population between 16 and 34 years used Internet. In contrast, only 8% of the people between 65 and 74 years used the net (Plan Avanza 2008, Ministerio de Industria, Turismo y Comercio de España).

We can see that elderly people are not using e-healthcare services. In this sense, we need to improve the acceptance of these services from the beginning, knowing their actual technological needs.

2.2 Principal Technological needs for Elderly People

According to the information gathered in previous research (Eggermont et al., 2006), elderly people feel that ICT services could provide them more social support and help them to fight the loneliness. They want to keep the contact with their relatives, friends and associations if their mobility decrease and they have to spend a lot of time at home. However, they don't want to lose face-to-face communication with the doctor or the other medical assistance.

They want accessible technological services, designed according to their physic limitations and previous knowledge. Besides, the accessibility includes more economical services and tools suited to their incomes.

Elderly people also want secure and reliable e-healthcare services to guarantee their intimacy. For

instance, they want to have control over their medical information and they don't feel confident when the information is circulating on Internet. They like to feel safe and informed about their health. The new technologies must guaranty the needed assistance but also intimacy and autonomy.

In spite of this detected needs, the access to e-healthcare systems is still very low. As we can read in the survey "The attitudes, expectations and needs of elderly people in relation to e-health applications: results from a European survey." (Stroetmann et al., 2002): "*older people get, the more they depend on medical and social care, and the more they tend to live alone, without a family member to look after them. Policy measures relating to infrastructure as well as training, education and awareness activities will be required to avoid a medical divide between those senior citizens who have access to advanced medical advice and services and those who do not.*"

Elderly people need e-healthcare services but there are some problems to accept and use them. We claim that we need a methodological framework based in a user centered design to create services widely acceptable by elderly user. Following, we are going to summarize this methodological approach.

3 METHODOLOGICAL APPROACH

Our approach is based in the User Centred Design (UCD) premises, taking into account the specific characteristics of the target group (elderly people) and the kind of technological services (e-healthcare).

3.1 User Centred Design

The main objective of this methodology is to incorporate the end user point of view in the final design of one product or service, adapting the products and services to the real needs and interests of the users.

Following Alison Black (2008), the first premise of the UCD says that the best designed products and services are those that include the comprehension of end users needs in the first steps of the product development. In this sense, UCD is a continuous and transversal process to the development, going beyond the concepts of usability and ergonomics.

Summarizing, UCD involves, among others, four basic principles for the researcher/designer:

- Contact directly with the users starting from the initial phases of the design, trying to

understand their needs and habits in real contexts.

- Observe the users directly in their context, participating like one of them (context immersion) and gathering the observational data.
- Design prototypes and evaluate them iteratively in order to gather the user feedback. Incorporate this feedback to improve the prototypes.
- Gather information from the higher number of users profiles because the service could be used by more than one user profile.

In the UCD process we have to take into account the variables of the target users and develop a multidisciplinary approach.

3.2 What Impact the Acceptance of e-Health Services by Elderly People?

According to our previous studies with this population group and the reviewed literature, we are going to explain briefly which are the main aspects affecting the acceptance of e-healthcare services by elderly people.

Psychosocial Aspects: The social and familiar situations are very important when setting out ICT solutions for elderly people. The most important factors that we have to take into account are:

- Family and social network: some elders don't have enough social contact with their relatives or friends and it could produce a feeling of isolation.
- Work: probably they did not need to use the new ICT in their jobs so the metaphors associated with the use of the computers are not familiar to them.

Cognitive Aspects: There are important variables that affect the interaction between elderly people and technologies:

- Attention: for this kind of user is more difficult to focus the attention. In this sense, the interfaces have to avoid graphics or other irrelevant elements for the task.
- Memory: the learning process for any computer application is significantly more difficult in elders compared with adult and young people. The memory deficit seems to be one of the main reasons. Nevertheless, the level of previous knowledge in ICT use could minimize this negative effect. In other words, elders can learn as fast as adults and young if

they have a lot of previous experience (Czaja and Sharit, 1993).

- Perception and vision: the research in this field has state that vision loss affects the interaction between elder people and ICT applications (Jacko et al., 2000).

Psychomotor and Physiologic Aspects: The most important variables that could affect the design of ICT services for elderly people are:

- Speech and audition: is important to adapt frequencies in the audio interfaces and the speech applications to elderly people characteristics.
- Psychomotor aspects: there is a reduction of the skills, especially in small movements, so the elders could have problems to use the mouse and the computer or mobile devices keyboards (Worden et al., 1997; Chadwick-Dias et al., 2003).
- Subjective perception of the relation between software functionality/complexity and the utility and ease of use: Wu and Van Slyke (2005) state that elderly people could be more impact for the interface complexity that young people. This impact can affect the feeling of ease of use.

There are other aspects affected by the age of the users that they are not took into account for the moment in the ICT applications for elderly people such as symbolization, logical thinking, error management and autonomy. In other to gather information about all these aspects we need to use a multidisciplinary approach that will bring together observational studies about user requirements in real context; experimental methodologies that will gather the impact of psychomotor and cognitive aspects that are relevant to elderly people; and technology specialists that will provide input about ideal technological solutions for the needs of this specific group.

3.3 Methodological Approach

Our hypothesis is that actual situation, in which most of the elderly people are excluded of the e-healthcare services, is produced because the cognitive, psychosocial and psychomotor particularities of elders are not taken into account in the provided services.

Therefore, we propose a reconsideration including these aspects that normally are being leaved out. Following, we present our methodological approach.

