Understanding Elderly Needs for Designing a Digitally Extended Environment via Tablets

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Abstract. In this short communication we describe our methodological framework for developing an extended digital environment for the elderly. The core of our approach is based on probing elderly needs via storytelling to be interpreted in a wide sense. The probe consists of activities to be carried out by the experiment group, such as taking pictures, making a collage, writing a diary.

Keywords: participatory design, storytelling, elderly, user-centred design.

1 Introduction

The increasing of life expectation is a well-known phenomenon as are the related problems of maintaining an active ageing population. In Italy the aging index1 in 2013 is 151,4 elderly out of 100 youth, thus the population over 65 years old is now reaching 13 million [1]. In addition to the natural aging of the body and the possible diseases related to old age, many of them live alone. In recent years many governments have been investing in and many researchers are working to find solutions to improve the general quality of life of the elderly.

In recent years, we have seen at the same time an increase in mobile technology – smart phones or tablets - and the development of all types of applications, including social networks, for study, for entertainment, for the maintenance of relationships or connections among family members, and so on. The elderly also suffer the technological gap that keeps them distant from their own grandchildren, who were born to a digital world.

The aim of our research is developing digital means for an extended environment for elderly. For issues related to age and to the possible difficulty of movement or reduced social activities, in fact, the elderly are facing an increasingly reduced physical environment around them. One of our intentions is to recover part of the physical space via a virtual environment that can help them maintain a more active life.

A digital environment can provide a compensation for part of the reduced interaction of the elderly with the environment. Due to old age and the limitations that it

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1 The ratio between people over 65 years old and youth up to 14 years old.

brought, a manageable and usable environment should be one of the main things to take into consideration. The design of new technologies has changed and it is no more only a practical or usable design tool or application, but rather something that has inside some emotional aspect of the user experience. Designing an application framework for tablet to help elderly in their everyday activities and needs could let them feel still active in our society.

The choice of working with tablet technologies instead of smart phones is given by various practical aspects in relation to the difficulties that aging people could encounter. In fact the medium that is desired:

— Is light enough to carry everywhere the user moves to: elderly people may have problem in carrying heavy objects;
— Has a screen bigger than a mobile phone, even in a 7inch model: elderly with visual problems can interact with a tablet in a better way when compared to a smart phone;
— Has an easier interactability;
— Has no internet connection, but just wi-fi: reducing the other cost and taking advantage of the spreading of the wi-fi zone in all the cities;
— Has multiplicity of applications that are constantly being developed and downloaded for free;
— Has no sim card for call: again for reducing cost but also because we believe elderly who has their own mobile phone won't change the way they use it.

2   Storytelling as a Cultural Probe

Human beings have used the art of storytelling to tell stories, to teach, to communicate knowledge, or for entertainment. Storytelling in all its forms is the main way through which an individual imposes order to their experiences also to understand others and the differences of roles within the society. "At the family level, storytelling is used - often unwittingly - by parents to socialize their children, to teach what stories are appropriate and important, and aid their development in becoming competent tellers of the family's life stories. [2]"

Narrative approach is fundamental in Jerome Bruner vision of the creation of the self. According to Cultural Psychology in which Bruner and Vygotsky were two of the most important contributors, mind and culture cannot be separated. Life is a novel, according to Bruner and it is built by the stories we tell everyday to ourselves or to the others. "We organize our experience and our memory of human happenings mainly in the form of narrative – stories, excuses, myths, reasons for doing and not doing, and so on. …. Narrative, then, are a version of reality whose acceptability is governed by convention and 'narrative necessity' rather than by empirical verification and logical necessity, although ironically we have no compunction about calling stories true or false."[3] On the other way creativity for Vygotsky is in the society itself and help people in learning and internalizing things that help in generating new creative ideas [4].

3   Designing the Cultural Probe

To understand the inner thoughts of elderly that can help us in figuring out what should be the most useful app for people over 65 years old, we decided to implement a probe kit to work with and propose to our sample. The purpose is to capture some inner thoughts of the participants in a more relaxed way.

From the first developed in 1999 [5], the cultural probe was used in different research studies involving elderly population in different activities to explore in a creative way their domestic environments, their social network, health and assisted living [6]. A probe is a research methodology of user-centred design that can be useful for understanding human phenomena and exploring design opportunities [7].

A cultural probe is usually made of activities such as a diary, a list of photos to be taken, a map to draw, some pictures to comment. All of the material are intentionally open-ended. Due to the nature of the methodology, analysis is not easy and can bring some ambiguity, but it is for sure a creative way to talk about a group life in an informal way. Usually a probe kit is left to the experimental sample for a fixed period of time during which the group, individually, has to carry out the activities proposed. After that period all the materials is recollected and analyzed within the research team.

We designed a probe pack of activities in the form of a diary, visual and written, according to the theoretical framework illustrated in the previous chapter. Our kit consists of:

Table 1. activities of our cultural probe kit proposed to a sample of elderly

Activities	Action to be performed	Aim
Photos	A list of 20 items participants should explore taking pictures	Reflection on private life explored visually
Diary	A colored booklet to fill in with written thought or past stories	Reflection on the past and the current life in the form of a story, or a tale
Collage	A cardboard in which each participant has to create a collage following a given theme	Reflection in written and visual form of the given theme and finding of the materials they need to complete the task (picture, textile, written words, and so on).
Postcards	Postcards prepared with photos and an open comments area to be completed by participant	Reflections on pre-formed images and text

3.1   Experimental Set Up

Our cultural probe in form of diary was presented to a first group of elderly that usually attend classes at a special "university" for the elderly2. At the university there

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2   UNI.DE.A. – Università degli Adulti, is a cultural association in Pisa established in 1983 providing educational courses and lectures in multidisciplinary topics for elderly.

are classes of practical artisanship, as well as classes on computing, history, cultural heritage, or scientific seminars. The group is particularly active in their daily lives and for this reason we decided to start from them. We believe that the experience gained from observing this group could inspire us in entering better the elderly population.

In the first meeting with one of the teachers of the university, we decided to arrange a meeting with all the elderly interested in our work. We explained the methodology and the tasks to be carried out to this group and we gave them two weeks to complete all the activities of the probe kit.

4 Towards the Design of the Extended Digital Environment

The data obtained via the probe provide us large amount of raw clues for the design of applications for tablet. We are in the phase of evaluating in the research group the results collected. Next step is to discuss the intuitions obtained from the evaluation phase with the experiment group to get their feedback which may require a second critical look into the data. This phase will be followed by the shortlisting of applications to be developed for tablets. The application prototypes will be tested by the same experiment group.

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