Work 41 (2012) 5576-5578
DOI: 10.3233/WOR-2012-0887-5576
IOS Press

Seniors and technology, ergonomic needs and design considerations

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Abstract: This work is based on the ergonomic approach and the principles of universal design, with the aim of establishing the cognitive design features that interfaces must comply, for older adults achieve a good performance during their interaction with technological aids. Describes the analysis of exploratory experiences with a group of 17 older adults was aimed first to establish the main barriers to implementation that arise during these activities, and secondly to set the variables to be addressed and the procedure required to develop depth study, where the relationship establish between the quality of the stimuli and the level of performance achieved in the implementation of older adults with interfaces, observing each of the cognitive functions that promote independence, attention, motivation, memory these processes. The study in depth, looking for describe gaps and mismatches encountered during execution, which hamper the harmonious interaction processes through participatory methodological approach that allows to specify requirements for the creation of stimulating interfaces for cognitive skills and committed with the levels of autonomy of the elderly.

Keywords: cognitive design, older adults, previous experiences, interaction.

1. Introduction

There are various classifications such as authors, as to when you are elderly, although generally considered an older person that arround about 65 years old. The factors that determine the membership or not this population group are related to lifestyle and activity level it performs, but decisively, involving the conditions of dependence on others for daily activities that adult require.

Some studies have expressed the significant increase in population of people over 65 years compared to other age groups in most of the countries; situation that apparently continue to increase in coming years. In Colombia in particular, and according to the DANE census of 2005, 6% of the population are over 65 years and is projected by 2050 this ratio increased to 20%. These data demonstrate and accounts for the large number of studies now tend to achieve a better quality of life for this last stage of existence.

2. Problematic

The needs for autonomy and social integration of the human being are physiological psychological and sociological. Unfortunately, the arrival of adulthood, which covers about a third of life brings about progressive deleterious changes in many aspects mostly morphological and physiological, which are primarily related to decreased mobility, cognitive ability and fitness, variations that create disadvantage and lead to progressive dependency and exclusion of the majority of activities taking place on a daily basis.

Despite the decline in physical and cognitive abilities that are in part inherent to human nature, accessibility and usability as indicators of quality of life worldwide, only begin to consider in the twentieth century when realized that everyone at some point in their lives will be affected in our scope of understanding of messages, instructions, instruments or systems, due to deficiencies sensorial or cognitive impairments of aging. However, some technology products still show cognitive and communication barriers that exclude citizens who are disadvantaged in some condition, reducing their job opportunities, socialization, recreation and participation.

According to Norman (1988) objects generate wrong answers on users during interactions when they have not been designed taking count of the skills and abilities of those who use it, however, users transfer the blame to their lack of skill. Presumably, this situation creates an imbalance that affects well-being and self esteem. From this point of view, the absence of cognitive design considerations in the new technology implies marginalization and loss of opportunities for anyone, but it is indisputable that the elderly and people with disability status have been most affected to this situation.

3. Exploratory study

For a first objective approach to this problem, an exploratory study was performed with a group of 17 adults over 65 years eleven (11) men and six (6) women of different occupations, full conditions in relation to their age, in order to identify major gaps or barriers that are run during their interaction with everyday technological aids. Observations were made of moments of interaction when using cellular phones, camcorders, computers, treadmills, glucometers and blood pressure measurers. The research design privileged the strategies of ethnographic approach to the analysis of the action, within the natural contexts of use of technological aids. Different techniques of ethnographic research were applied: pure or systematic observation, participant observation, observation consulted, and co-discovery protocols and expressed thought and depth interviews.

The categories of analysis of this stage were: yield, number of errors, execution time, efficiency, acceptability, convenience, reliability, attitude and flexibility.

Regarding performance, it was evident during the experiment, the equipments have just a few obvious functions, this feature was related especially with cell phones mainly for the variety of search paths that allow same actions, an issue that adults can not relate to their previous experiences, causing confusion and uncertainty during use. But also it was found that increasing the time of product experience, allows interaction and progress in the reduction of the difficulties with the use of the interface. This feature was mainly in computer use, for these increasing duration of use was associated with improved quality of implementation during the interaction. This suggests that ongoing exercise modifies the processes of memory or perception even in the elderly, or the quality of the stimuli allows achieving a higher degree of comfort in the experience. Still according to the perceptions of users, which ultimately improves with duration of use is the understanding of the interface.

This diagnosis, identified some gaps in the implementation of activities and varying degrees of limitation on the use of daily use technology, a situation that at least for users in the sample, was related to deficiencies due to not correspondence between physical or cognitive demands that equipments impose on capacity and performance skills that older adults have, and how it relates from their conceptual systems for use with the new technological resources.

4. Objectives and analysis elements

From the findings of this exploratory study, a next stage for the project was formulated, that will examine the extent of the quality of perceptual stimuli, stimulate specific cognitive skills that promote independence for older : attention, interpretation, perception and memory. And to the extent that these capabilities promote correct implementation processes and no major reasoning for the use of interfaces.

The elements of analysis, will be determined by three aspects: first, the older users including both cognitive abilities and skills that promote independence, and their motivations, needs and expectations as a social being. Second, the characteristics of the interfaces of aid technologies that generate imbalances in the processes of interaction, and finally, theoretical and practical characterizations concerning cognitive skills that facilitate the development of harmonious relations of use and propitiate independent of both the elderly and any individual during the use of assistive technology. In order to make a contribution to the current situation, the current project considers two objectives:

* Establish the difficulties associated with cognitive skills: attention, perception, interpretation and memory, found by elderly during the interaction with technological aids.
* Structure results that favor the development of ergonomic strategies to keep in mind during the development of interfaces that address the cognitive skills of attention, memory and perception of the elderly.

From the results of these objectives, will articulate the universal design requirements and cognitive design, that allow to formulate ergonomic strategies that favor the development of appropriate environments and products, tailored to the real needs of these users, tending for autonomy and improving the quality of life for everyone, from the determinations made in the study of the elderly.

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