

Methodologies for Involving Older Adults in the Design Process

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Abstract. Older people provide much greater challenges to user-centred design than more traditional user groups. It is also very important to encourage (often young) designers to develop a relationship with, and an empathy for, older users. It is recommended that older users be fully integrated into the design process. Researchers, however, need to take care to be sensitive to the characteristics, sensory and cognitive capabilities, and the attitudes of older people to computers and to being included in research studies. The paper suggests strategies for doing this, together with the more radical approach of using professional actors as surrogates for real older users.

Keywords: Older users, accessibility, user centred design, theatre in usability studies

1 Older users and the User Centred Design Community

The design community has been aware of the importance of involving users in the design process for many years [1]. This approach is also an integral part of “Participatory Design” [19]. These and other mainstream techniques, which recommend involving users, however, rarely consider the particular challenges of older users. The needs of older and disabled people are more often addressed by the “inclusive design”, “design for all”, and/or “universal design” communities. These tend to focus on designers ensuring that products can be used by as wide a range of people as possible, and have produced a range of guidelines and standards to assist designers in achieving this objective [e.g. 10, 31]. There is, however, increasing evidence that guidelines alone are not sufficient.

Milne et. al. [17], for example, found that designers need more than just W3C guidelines if the web sites they develop are to be usable by, as well as “accessible to”, older people. This view was confirmed in a recent survey of the accessibility of websites by Petrie et. al. [28], who found that the observance of W3C guidelines did not necessarily lead to a site which was usable by disabled people. Newell et. al. [23] describe a specific example of the ineffectiveness of only reading guidelines and

attending lectures for educating software designers. He and his co-workers acted as advisers to a consultancy company developing a proof of concept web portal for older people. The engineers in the company were high quality engineers well aware of user centred design principles, and had been given data and presentations on the characteristics of older people. It was not until they actually met with older users, and saw them trying to use paper prototypes, however, that they really understood the very low level of awareness of all aspects of computers of many older people. This also confirmed Wixon's comment that "it is no accident that most usability testing involves encouraging entire design teams to watch the test, and it is well known that much of the effectiveness of the test comes from this active participation" [32].

The level of engagement between many HCI professionals and older people was illustrated in a recent HCI conference where, unusually, a keynote speech [25] focussed on the challenges computer interfaces provided to older people with little or no experience of computers. This keynote was also unusual in that the presentation included professional actors who presented common scenarios which occur with these users, examples of which can be found at [33]. The presentation provoked a very lively discussion, but, amongst the points made by the audience was "that the older couple would not have had any problems if they had a new computer. This comment focused on the couple's computer not having a spare USB port, and ignored the major challenges which installing a web cam had provided for them. An even more disturbing trend which appeared during the discussion with the audience was that many saw the problem simply being one of the need for training. When the presenter asked whether there were any lessons to be learnt for HCI design, a member of the audience commented that "the interface design (of the software being used in the scenario) was not our responsibility".

There is a real need for designers to interact with older people and the most effective way to do this is for older people to be part of the design process. Unfortunately, traditional User Centred Design methods provide little or no guidance about how to involve that user group [20]. Hypponen [10] commented that "there were many different methods of choosing how to collect user needs and integrate them into product development, and that the suitability of this approach to accommodating a range of disabilities into the design process (in an effective and efficient manner) is unclear" and Keates and Clarkson [13] "that there are relatively few examples or guidelines for successful involvement (of older and disabled people), and often traditional formats have to be adapted"

2. Involving older and disabled people in the development process

Obtaining requirements and evaluation data from marginalized groups, such as older people is not straightforward. Newell and Gregor [24] have suggested that a new design paradigm should be developed for these groups of people which they call User Sensitive Inclusive Design where "sensitive" replaces "centred" to underline the extra levels of difficulty involved in user groups which contain older and disabled people.

The inclusion of such groups can involve significant communication problems between users and designers due to hearing deficits, and to their lack of understanding of computer jargon and metaphors [6]. Many older people have a fundamental distrust and

a very limited understanding of the underlying computer concepts, leading to a reluctance to experiment – a *sine qua non* for successful interaction with most software [9]. Visual language conventions can also cause confusion - scroll bars being an example of a whole repertoire of “widgets” of which older people have limited or no experience. Various researchers also report on the problems encountered when running focus groups with older people [2, 14]. There are some case studies about design processes involving older people which give valuable pointers as to how information can be elicited from this age group [8].

Older people tend to be very positive about the prototypes which are presented to them, wishing to praise the developers rather than give an objective view. If they cannot cope with technology, they tend to blame themselves rather than poor design [6]. They often experience anxiety, and can be negative about the amount of effort required to learn to use computers, often increased by their assumption that they are no use to them [15]. Age related factors can also make self reporting inaccurate (for example, in questionnaires), with recent research showing that there are age differences in the ways in which people respond in self-reports [27]. In addition, challenges may arise because older people tend to tire more quickly [12], and this can severely limit the duration of sessions.

Because of their unfamiliarity and potential fear of computers, older people’s confidence in their ability to use technology can be very fragile. A usability flaw could thus have a catastrophic effect on an older person’s confidence. User centered designers thus need to be particularly sensitive not only to the sensory and cognitive abilities of older people, but also to their psychological state and their perceptions of technology. Some of the information which designers are trying to elicit can be particularly sensitive, and care needs to be taken to carefully choose topics and appropriately introduce sensitive topics. For example, Russell [30] found that many older people may not want to talk about topics such as social isolation, “because such an acknowledgement challenged their identity as independent people”

In addition, motivations behind user participation should be considered and an awareness of, and sensitivity to, users’ motivations for participating are important considerations in working successfully with older people. For example, the author and his colleagues, and Lines and Hone [14], have found that it is not easy to keep a focus group of older people focused on the subject being discussed. They suggest that a contributory factor to this is the motivation of the participants: many informants see these groups as vehicles for socializing as well as providing information to the researchers. It is thus important to provide a social gathering as part of the experience of working with IT researchers rather than treat them simply as participants. Researchers in Dundee, for example, devote at least the same time to allow older users to socialising with each other as for the formal experiments.

3. Laboratories

This need for close interaction between researchers and users also means that traditional Usability Laboratories with two-way mirrors are less appropriate for older users. As has been stated, many have very low confidence in their abilities and thus it is important that

experiments be conducted in a supportive environment, where the users are shielded from making major mistakes which could destroy their confidence altogether. The authors of this paper thus deliberately decided to have a studio theatre rather than traditional usability laboratories in our new building [26] (also see the discussion on the use of theatre below). It is also now normal practice to have a researcher in the same room as the user who will give help when necessary. With this methodology, it is necessary to use measures such as the number of tasks completed “with no assistance”, “with minimal assistance”, and “with significant researcher intervention” rather than the more traditional measures of number of tasks completed [5].

4. Choosing a users group and interacting with it.

The methodology of choosing a user group is also important. Because of the very wide diversity of the sensory, motor, and cognitive characteristics of older people, as well as in their education and technical background, one is never likely to obtain a “representative sample” of the user group as can happen when the user group is much more constrained. Thus the users to be tested must be picked with care to illustrate those characteristics which the researchers believe important. It is thus important that an adequate cohort of older people is available to the experimenter, and it is valuable to form a long-lasting partnership with them [7].

Eisma et. al [7] propose that both the users and the designers should be involved in concept development, initial requirement gathering and prototype stages of the project, so that both sides are aware of the various criteria that shape the project, and both can influence early design choices, but they stress that both parties need to be willing and able to talk about their expertise in language comprehensible to the other party, and always to respect the other’s contribution and expertise. This can be facilitated by making focus groups, or other activities, into pleasurable social events, by providing refreshments and, crucially, time for social interaction, both among the participants and between participants and researchers [18]. Hands-on sessions, where older people experience new technology, have also proved more successful than verbal explanations or demonstrations, and these can often lead to spontaneous suggestions for improvements or for new products [11], and hands-on sessions allow researchers to observe the difference between what people report and what actually happens [18]. Gheerawo and Lebbon [8] describe a similar process which they called ‘empathic bonding’ to stimulate creative thinking and user-facilitated innovation.

5. Self Reporting

Questionnaires and other methods of self reporting are widely used in HCI, but research shows that there are age differences in the way older and younger people respond in self reports. For example, they use the “don’t know” response more than younger respondents, and are also likely to use the “don’t know” option to questions that have complex syntax or are semantically complex. Eisma et al [6] specifically excluded a

“don’t know” response, but even this was thwarted by some respondents, a number of whom penciled in their own “don’t know” column. Older respondents are also generally also more “cautious” in their behavior, and need to “have higher threshold levels of certainty” before responding to questions [27]. Their responses also tend to avoid the extreme ends of ranges.

Eisma et al [6] found that the best way of addressing this reluctance was for a researcher to administer the questionnaire directly. This had the advantage of leading to spontaneous excursions into users’ own experiences, and demonstrations of various personal devices were relatively common, and provided many useful insights. Dickinson et al [4] found that that in-home interviews were very effective in producing many stories about how the equipment in the home was obtained, how people learned to use it, who supported them, and the reporting of a variety of both good and bad experiences. They believe it to be unlikely that such a wealth of information could have been obtained in a laboratory situation.

6. The use of theatre

Interacting with older people thus has to be done with care and needs time and effort to do it well. This is not always possible due to constraints of time and resources.

Newell and his colleagues therefore have investigated the use of theatre professionals - actors, script writers and directors - who were experienced in Interactive Forum Theatre techniques [21,22] This particular type of theatre encourages substantial interaction between the audience and the actors about the particular issues addressed by the theatrical presentation. They have used this format both for requirements gathering with older people and for encouraging dialogue between older users and designers.

A script writer conducts detailed research on the subject area and produces a series of short plays which address the important issues to be discussed. They contain ‘human interest’, humour, and dramatic tension as well as illustrating how the system may work, the errors which could occur in its use, and the effects of these errors on the participants. Each scenario lasts approximately five minutes, which typically leads to about twenty minutes of discussion. The format can be a video presentation followed by discussions, or live theatre, or a combination of the two.

These techniques have been used within the requirements gathering phase of a project developing a video camera based ‘fall’ monitor and detector for older people in their homes [16]. It was reported that the dramatized scenarios provided an excellent way of setting a shared context for discussions between potential users and designers, focused discussion on specific scenarios of likely system usage, and were very effective in provoking discussion of relevant details because elderly users could imagine themselves within the scenarios shown in the video.

Similar techniques were used as part of the UTOPIA (Usable Technology for Older People: Inclusive and Appropriate) project, whose primary aim was to develop techniques for changing the mind sets of designers concerning the usability needs of older people [4]. This project culminated in the production of the UTOPIA Trilogy [33], a series of videos addressing issues of older people’s use of technology. Overall these videos were found to be a very useful method for provoking discussion and one which

potential users find interesting and enjoyable. This ensured that user requirements were explored effectively early in the design cycle, and that designers became more aware of the issues addressed [3].

Newell and his colleagues have also used live performances [25] and have discussed the pros. of cons. of this type of presentation [22, 29]. Although the use of actors may not be wholly appropriate for very detailed evaluations of user interface, they describe the advantages both when a more holistic approach is required, and for very novel design briefs where an entirely new technology is being developed. It is worth noting that script writers and actors are trained as professional observers of human behavior and their skill is presenting that behavior in a way which engages the viewer/audience.

In addition, actors could also be valuable in usability testing by encouraging dialogue between the participants and the researchers. The use of actors removes the ethical problems of “protecting the users”, and it is possible to envisage a situation where the designers and the users can verbally attack each another as part of addressing the usability issues of a particular system – a situation which would be difficult in a traditional usability laboratory setting, and likely to be unethical. Actors can also present a more generic picture of a user and can change their personae in response to requests from the designers (e.g. what would happen if you were older, if your sight/hearing was impaired, if you were under pressure?).

Finally theatre encourages a creative approach to design, involving users as well as designers, rather than the traditional view of focus groups and usability testing being solely a method of eliciting users’ views and opinions, and to determine their abilities to use specific interfaces and systems

7. Conclusions

It is essential that the voices of users are heard in the design process, but this provides significant challenges when the user population contains older and/or disabled users. They are a much more diverse population than most traditional user groups, and there are communication challenges caused by sensory loss, culture, language and attitudes to technology. There can also be major ethical problems in dealing with such groups.

Thus special care needs to be taken when working with older people, and a range of techniques need to be adopted to ensure that the data obtained is accurate and not distorted by the ‘surface’ attitudes of the older people. It is most effective if the older people are seen as part of the development team rather than just subjects of experimentation, and that the interactions between them and the designers are set within an enjoyable social experience. This ensures that not only is appropriate data gathered but also that the designers develop a real empathy with this user group.

The use of professional actors and live theatre is a further way which has been shown to be effective in facilitating discussions with users, or in those cases where it is too difficult or inappropriate to involve real users in experiments and dialogues. Although not an inexpensive option, the value which can be brought to the interaction by theatre professionals can be very significant

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