

# Optimizing Qualitative User Needs Assessment through Affective Analysis

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**Abstract.** Interviews, focus groups and cultural probes are three of the widely used methods in the user requirements research on AAL technologies for elderly people. This paper reports several advantages and disadvantages of these methods. The results of our work indicate that there are still plenty of opportunities to optimize the existing methods. Our main aim is to increase the amount of information that we get as elderly users hardly report information on every day problems, everyday facts, routines, values and self-perception. We discuss the problems and evaluate the existing methodologies with emphasis on values/fears vs. needs and affective/emotive vs. cognitive argumentation.

**Keywords:** User Centered Design, Elderly, Methods, Ambient Assistive Living

## 1 Introduction

HERMES is a project that develops ambient assistive living technologies (AAL) for elderly people. The project focuses especially on the stimulation of cognitive abilities and help against forgetfulness. In this paper we discuss problems, advantages and disadvantages of methods used in the user requirements engineering phase of the European AAL project HERMES

Semi-structured interviews, focus groups and cultural probes as methodologies were used to get information on user requirements (initial project phase). Our work indicated that although they are widely used in the research field, all of these methods need optimization especially when carried out with elderly users. It can also be discussed that these methods are hindered due to their natural characteristics of being short time studies and conducted partly in artificial environments but on the other hand even these features can be optimized because due to time and financial reasons these methods are applied within AAL research projects. This work wants to enhance

the techniques mentioned and gives an outline of possible solutions and future challenges for the given realm as researchers have to deal with such situation.

## 2 Existing Methods & Their Evaluation:

### 2.1 Semi structured Interviews

Interviewing was one of the methodologies applied in user requirements. The results were very informative on principle concerns like health security and memory needs, the common opinion that assistive technology to do cognitive training was perceived as useful, despite the fact that respondents reported that they do not use much technology in their every day lives. Accordingly respondents told about importance of their feelings, their world in general, perception, disappointments, fears about getting worse or the importance of being responsible to others. However, an inclusive idea about user requirements for technology within the AAL user group could not be retrieved. The evaluation showed that the majority of attendees have no real idea what it means to deal with the technology proposed as she/he never used it before. Since they do not see a need in using such a thing or they did not see someone else using it, the real life context of the technology was not clear. The embedded meanings gathered through the talks, interviews and side stories made us to ask further questions about the importance of social and psychological factors other than ease of use and usefulness on technology for the acceptance of it among elderly. Sample findings (interviewer notes) were as follows:

“...they *don't feel* the need to have a device now... On the other hand, they have had unsuccessful previous experiences with technology. For this reason, some of them are *reluctant* to the use of new technologies in general... Many of the interviewees report about *getting angry* at themselves and *being annoyed* when they need to search for something like glasses ... More severe is the fact that nearly *all are worried* about the future...”

Here we advice two potential methodological improvements:

We argue that focusing on fears not on needs will increase the accessibility of information. Expressed in a much exaggerated way, we believe that users do not know which technology they want/need, but they know what they don't want/they fear. We further believe that this tendency is even stronger while interacting with elderly users. Hence, by letting respondents tell what they fear we are able to design technology accordingly (“I don't want to loose contact to my grandchild” -> design communication technology; “I don't want to loose my ability to organize my shopping by my self” -> “do not design a digital shopping list”).

We further believe that applying an interview technique that is shifting the focus of the interview to a compeer user - which could be "a friend", "a relative" (etc.) - may

improve the situation as we recognized that respondents felt themselves more comfortable while contributing to the issues in a general manner not about themselves. We argue that although talking about “compeer user”, respondents would still inform us about the target group’s concerns but with grater impact.

## 2.2 Focus groups

As interviews, focus groups work in a way that they uncover principle concerns but in a more collective way. By creating a mock-up of the system’s interface and trying to establish a link to real context situations, a material aspect was succeeded (Touching a real object). With the mock up and the depolarized structure of the method we gathered further comments and comparisons. For example only after focus groups it was more obvious that attitudes are more important than knowledge and self-esteem or ethical concerns play a great role in discussing things. Sample findings: (tester notes) were as follows:

“... healthy habits and their practice are a matter of each person’s *attitude*. Elderly people of this generation are *reluctant* to any technology that aims to reduce their autonomy or minimize their cognitive or functional effort, because it would mean *dependency*. ...they consider the device that is intended to be developed on this project a useful device for *younger people with complex jobs* (i.e. executives) or maybe for *elder and more cognitively impaired people*. ... they are doubtful about the nature of the recordings performed by a device from an *ethical* and *legal* point of view.”

In focus groups we recognized that respondents show a tendency towards proposing technology solutions for others; here the evaluation can be on the environment and materials introduced as the group is more open than just a person to discuss, try and evaluate new technology. Focus Groups can be organised in a way that the artificialness of the environment plays a key role and the depolarized structure as well as the group psychology may help having further comments while introducing new technology.

## 2.3 Cultural Probes

Using cultural probes, one gets a good overview of what elderly users actually do during a day, but again they do not directly collect impressions of problematic situations. For example HERMES Project respondents tend to describe normal living situations that often do not refer to personal problems. We believe this is caused by the understandable fear of being a person who needs assistance (I can manage it), self recognition of problems and getting frustrated. Sample findings from the HERMES probes reflect this; especially pictures taken by elderly as a part of probes reflect this dimension very clear:

In the HERMES probe setting, users made nice pictures on their everyday lives but most of the pictures don't point a problem, actually they are all "beautiful" and the captured frames are most of the time a corner full of books, a tidy living room or a scene from balcony. Hence, finding relevant problems for the design of assistive technology was still a challenging task.

Here, making the participant discuss and collect material related to daily issues, on the street, about transport, badly designed products or making photos of things that concern *other people* may solve this problem (proxy probes): By bypassing user's dislike to report self-related issues especially related to their homes. By externalizing the observations from users, but still keeping them very real, focusing on a person from a close circle, we want to create the necessary distance to overcome socially uncomfortable situations. By taking a step back with respect to intimacy, we can remove specific barriers through the proxy probes that allow us to actually come a step closer to observing real life behavior.

### **3 Affective vs. cognitive argumentation**

Interviews or focus groups follow a cognitive way of discussing pros and cons of proposed technology. In contrast during fieldwork we noticed that our target group's attitudes are rather affective. Psychology argues that affective attitudes may be influenced by affective arguments but not by cognitive ones [1]. Although we do not attempt to change attitudes with our work we still have to rebuild our methods in reference to cognitive vs. affective argumentation (can we expect someone to respond cognitively to an issue although her/his attitude is an affective one?). Our hypothesis is supported by the fact that the more we used material connections in our methodologies (i.e. interface mockups) the closer we were to the problems that elderly face, the fears they have, things that make them sad or unhappy. That is why we thought to reformulate our methods in order to find out *how we can design technology* for elderly users. Therefore we proposed to evaluate the methodologies with an emphasis on values, fears and compeer-users.

### **4 Conclusions**

By combining the three discussed methods HERMES' user requirement phase was successful in identifying the most relevant concerns and problem fields our assistive technology should address. However, as explained potential improvements of the methods should be discussed on the basis of our findings.

- Affective/fear centered Interviewing
- Compeer users Interviewing
- Material centered Focus Groups
- Proxy probes

Overall, it's quite obvious that the lack of technology experience of our target group is a dominant reason in their decision-making. In such situations (low information accessibility) socio-psychological findings [1] show that respondents choose to take the most direct way - in our case this would be "rejecting" a technology. Still, we have to evaluate our findings in reference to actual and future technology acceptance especially for sustainability reasons as technology is "unavoidable"

This research indicates that, it is not enough to persuade the user that the system/product work well and is good for him/her, the obstruction due to values, social setting and self perception must be analyzed. Discussing fears vs. needs we argue that formulating a value-framework is needed. Such framework gives advice, which values are important to users in their home environments and every day lives. Hence, researches are able to align technology along to these values and not to harm values (example: proud to manage shopping list vs. a system that manages this task = lost of individuality). As future work we are seeking to enhance existing technology acceptance frameworks [5] with reference to value-sensitive design approaches [3].

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