OBTAINING FEEDBACK ON ADVANCED PRODUCT CONCEPTS FOR ELDERS

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1. INTRODUCTION

The Proactive Health group at Intel Corporation has been conducting research on elders in an attempt to develop computing solutions to allow people to "age in place" and to remain healthy and active for as long as possible. Our focus thus far has been on cognitive decline. Diseases of cognitive decline, such as Alzheimer Disease, affects ten percent of adults over 65 and 50 percent of adults over 85 [1]. Our process for conducting research and developing technology concepts is described in figure 1 below.
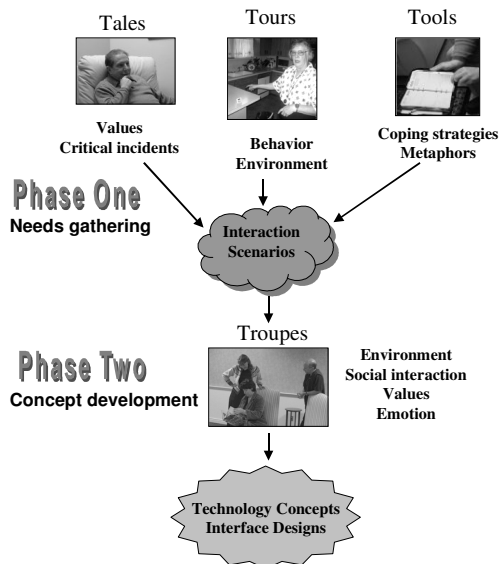

Figure 1. The Research Approach

In the *needs gathering* phase, we conducted interviews that elicited elders' stories (tales), "day in the life" tours of the house (tours), and key artefacts that they use in their day-to-day activities (tools). These data types revealed elders' values, critical incidents in their lives, key aspects of their behavior and environment, and coping strategies. From this data, we developed interaction scenarios in which technology is used to help elders cope with the problems and challenges we discovered. In the *concept development* phase, we conducted focus troupes to elicit feedback from our target audience. A focus troupe (aka Informance) is a method of depicting a technology concept via dramatic scenarios [2, 5, 6]. In this method, actors show a concept by dramatizing its use in a staged context. The audience consists of target users, and a facilitator leads a discussion after each scenario about the concept and how it might be used (or not used) by the audience. Like a focus group, this method is qualitative – data is collected on people's reactions and comments.

I believe that this approach has produced insights into the development of solutions that might not have been obtained otherwise. By closely examining the lives of elders, their environment, their social networks, and daily routines, we develop insights into problems and opportunities in keeping elders healthy and active. By using the focus troupe method of obtaining concept feedback, we obtain actionable feedback from elders before investing expensive engineering resources in system development.

2. DESIGN ISSUES FOR ELDER TECHNOLOGIES

The specifics of our cognitive decline project are reported elsewhere [3,4]. Here I report on the focus troupe findings that address design principles for elder technology.

We contracted a local dramatic troupe to hire actors, develop a script, and facilitate the group. The script consisted of four scenarios, and 2-4 concepts were depicted in each scenario.

3. METHOD

We recruited three types of participants: healthy elders, those with mild cognitive impairment, and leading segment boomers (those born between 1946 and 1957). The healthy elder group consisted of elders 65 and over who had no diagnosed dementia or cognitive impairment, and were in generally healthy condition. The mild cognitive impairment group consisted of patients (and their spouses) who have been diagnosed with cognitive decline that is significant but does not meet criteria for dementia. Finally, the leading segment boomers group consisted of people between 46 and 57 who have had some experience in caring for an elder family member.

Group	# Participants	# Male	# Female	Avg. Age
Healthy Elders	35	21	16	73.1
MCI	16	9	7	71.6
Boomers	28	13	15	51.1

Figure 2. Participants

In all there were seven sessions – three healthy elder sessions, and two each of MCI and boomers. Each session lasted about 2-1/2 hours. In each session, the moderator introduced the topic area, described the informance group process, and had each participant do a short introduction. Then the actors were introduced, and they acted out scenario one. Participants then wrote down their initial impressions about the concepts that were dramatized on a notebook, and the moderator then engaged them in discussion. This occurred for all four scenarios, and was followed by a general discussion of all of the concepts. All sessions were videotaped.

4. RESULTS

In all, there were thirteen concepts dramatized. The concepts ranged from technologies to support healthy elders, such as an "exercise enabler" and a pervasive electronic calendar, to concepts that help caregivers look after elders who were in moderate to advanced stages of dementia. Participants reacted to all of the concepts in each session. In the content of the responses, there were consistent themes and concerns that emerged across the participant comments and across the different concepts. We've begun thinking of these themes as persistent criteria for any technology that supports elders and their caregivers. These themes seemed to serve as criteria by which the participants evaluated the concepts.

4.1 Impact on everday life

Participants were clearly judging the technology according to their perceptions of how it might change their lives, both positively and negatively. Participants were often eager to think creatively about how the technology might be used to suit their needs. For example, boomers pointed out that detection of wandering behavior would be great to keep track of their kids as well as elders. A prominent sub-theme was how the technology would impact **social interactions**. For example, an electronic calendar was perceived as possibly facilitating the sharing of experiences between relatives living apart. One person noted that a shared calendar would allow a grandfather to see his grandchild's sports practice schedule, and thus would facilitate conversation the next time they talked on the phone.

4.2 Flexibility

Participants reacted negatively when the technology did not demonstrate sufficient flexibility in accommodating an individual's lifestyle or functional needs. For example, people often commented that an interface modality would not fit all people. When a scenario demonstrated that a blinking light would signal the user about a situation, people would respond with comments such as "if the elder had poor eyesight, a light would not work." Participants made it very clear that technology needed to be adaptable for it to be acceptable as a solution in people's homes.

4.3 Device intrusiveness

Participants also reacted negatively to possible intrusion of technology, making life more difficult instead of easier. Related to this issue is **control –** people want to be able to control the technology, not have the technology control them. A typical reaction was, "I don't want beepers going off all the time – I have enough intrusion as it is." Technologies need to show value that clearly outweighs any actual or perceived inconvenience. A related concern was that the technology would foster premature or unnecessary reliance on assistive devices. It was clear that assistive devices should only help when needed.

4.4 Privacy concerns

There were several concerns around the privacy of information and who would have access to it. Most participants want control over what information is shared, and many felt that they only wanted to share information that was vital to their health or safety. Many expressed reservations about sharing even with a spouse or close relative. Any home monitoring technology needs to satisfy users that the information is secure and under their control. Furthermore, a reciprocal relationship would be preferred in which elder and caregiver share data with each other about their activities. If caregivers monitor elders, elders in turn should be able to track the caregiver. In a few cases, however, the absence of concern about privacy was surprising – this was usually when a caregiver was desperate for help monitoring an ill parent.

4.5 Failure modes/opportunities

Participants were quick to identify failure modes of the technology. For example, one participant noted that wearing the "smart" tennis shoes just to go out gardening would incorrectly notify an exercise partner that you were ready for a walk. The technology needs to be tailored appropriately for the elder's situation and environment. People --especially elders -- will abandon the use of a technology if there are even a few situations where it fails to work properly.

4.6 Maintenance

A final dimension of evaluation was the maintenance of the technology. Participants were very concerned about setting

up the technology and keeping it functional. For example, a participant expressed concerns about the number of voice prompts that would have to be entered to enable the sequential prompting of daily activities. Maintenance and setup must be minimal for these aids to be accepted.

5. CONCLUSION

Although many of the specific concepts tested were directed at solving issues with cognitive decline, I believe many of the design issues above relate to a broad range of advanced concepts for elders. It should be noted that elders and boomers were very positive overall about the concepts. Some of the most enthusiastic responses were in the following areas:

- Elders and boomers alike want state-of-the art interaction paradigms such as voice recognition and pervasive access to personal information.

- Technologies that ensure basic safety are highly valued, as was technology to support calendaring and reminding. Aids to help in name-face recall were also highly valued, even among the boomer groups.

- Many respondents wanted the concepts to be portable, and to offer outside the home assistance. Elders were not reluctant to push the technology envelope, such as requesting credit-card-sized displays or face recognition combined with in-ear name prompts for social situations.

Participants showed a surprising amount of sophistication and thoughtfulness about advanced technology and how it might impact their lives. I attribute this partly to the effectiveness of the focus troupe method. This method, because it depicts technology use in a more relevant social and environmental context, allows people to focus more on real world usage and less on the confusing specifics of computer technology.

6. REFERENCES

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