UTOPIA
USABLE TECHNOLOGY FOR OLDER PEOPLE: INCLUSIVE AND APPROPRIATE

Anna Dickinson
Applied Computing
University of Dundee
Dundee, DD1 4HN
adickinson
@computing.dundee.ac.uk

Roos Eisma
Applied Computing
University of Dundee
Dundee, DD1 4HN
reisma
@computing.dundee.ac.uk

Audrey Syme
Applied Computing
University of Dundee
Dundee, DD1 4HN
asyme
@computing.dundee.ac.uk

Peter Gregor
Applied Computing
University of Dundee
Dundee, DD1 4HN
pgregor
@computing.dundee.ac.uk

http://www.computing.dundee.ac.uk/projects/UTOPIA/

1. INTRODUCTION

UTOPIA (Usable Technology for Older People: Inclusive and Appropriate) is a three year SHEFC-funded[1] consortium project between the universities of Dundee, Abertay, Glasgow and Napier. The project was established in recognition of the significant demographic changes which are taking place in Scotland and the rest of the developed world, but which do not appear to have greatly influenced those sectors of industry concerned with mainstream technology. Despite a significantly ageing population these industries have remained focused on designing for young people; a dramatically shrinking market segment.

The UTOPIA project aims to address the relationship between older people and technology in three ways:

1. Developing a methodological approach to design for older people.
2. Exploring relevant application areas.
3. Influencing industry to recognize the issues involved in designing for older people and the necessity to do so.

In this paper we will address points 1 and 2; while influencing industry is a central issue for the UTOPIA project we will not discuss point 3 here.

Proceedings Volume 2 of the
16th British HCI Conference
London, September 2002

[1] SHEFC: Scottish Higher Education Funding Council

2. DEVELOPING METHODOLOGICAL APPROACHES

The functionalities of older people vary more widely than those of younger people. Some older people, for example, are severely impaired visually, or may have acute mobility difficulties; others may have any of a range of milder impairments, or may experience almost no age-related impairment. Designing for such a wide variety of functionality necessitates a re-examination of design strategies and methodologies and, in particular, a questioning of the concept of "universal design" [3].

One of the central foci of the UTOPIA project is the development of methodologies that address the specific difficulties of designing for older people; the software development process is a "self-conscious" development process where candidate methodologies are tested, refined and re-examined through the development of small systems.

In order to ensure that applications and methodologies are valid and useful, users and domain experts play a central role in the development process. A variety of approaches are employed, including discussion groups and individual interviews. The question of how to carry out successful interactions with such a diverse user group is another methodological issue.

One of the benefits of involving users from the beginning of the development process is that it allows a "holistic" approach to the software production. Rather than being caught in the software developer's dichotomy of application and interface, a holistic approach allows the designers to examine the context of the application in the user's life, examining the ways in which the user will learn to use the technology, what support will be needed and how the

user experiences and perceives it. Knowledge of these parameters and the strategies that the user employs, allows the designer to develop a system more suited to the user group which can support their existing perceptions and strategies rather than forcing them to embark on a complicated re-learning process.

3. Exploring Application Areas

This presentation will give examples of these methods by describing the early design process of a home-based exercise system for older people.

The usefulness of a home-based exercise system was identified as part of the process of "mapping the field" which began with library-based research.

Exercise is a vitally important component of a healthy lifestyle, with many benefits, including:

- improvement in muscle strength and bone density, reductions in body fat and risk of diabetes [6], and greater stability thus reducing the risk of falls [4].
- reduction of the risk of depression [1], some evidence that regular exercise can reduce age-related memory decline [2].
- post-operative or post-fall rehabilitation, particularly hip or knee replacements [4].

Many older people find regular visits to leisure centres too expensive or impractical in terms of time and travel, or people may lack confidence about exercising in public [5]. These factors are addressed by a home exercise system.

The continuation of the development process involved discussions with domain experts, both physiotherapists and specialists in exercise for the over-50s. Physiotherapists focused on hip replacements, emphasizing patients' negative experiences of the post-operative exercise regime which may consist simply of a photocopy given to the patient on leaving hospital, or may be regular hospital visits for several weeks for physiotherapy sessions.

User involvement is planned to follow the structure below:

1. Small group of target user interviews (3-4 users who have had hip operations)
2. Discussion groups (20 or more older people, most of whom have had hip operations)
3. Users as intermediaries
   Recognizing that older people have concerns and interests that may be different from those faced by younger researchers, we are testing a concept known as "Users as Intermediaries". In this case, older intermediaries who have had hip replacements discuss issues of concern with their peers and report back to the project group on the results.

It is hoped that a system developed in this way will dramatically improve the patient's experience, and thus improve compliance with the post-operative exercise regime and consequently the success rate of hip operations. Further, it is expected that the development process will yield significant results in terms of the efficacy of the methodological approach.

References

1 Arent, S.M., Landers, D.M & Etnier, J.L. "The effects of exercise on mood in older adults: A meta-analytic review" *Journal of Aging and Physical Activity* 8 (4): 407-430, October 2000

2 Fabre, C, Masse-Biron, J., Chamari, K., Varray, A., Mucci, P. & Prefaut, Ch. "Evaluation of quality of life in elderly healthy subjects after aerobic and/or mental training" *Archives of Gerontology and Geriatrics*, 28 (1999) 9-22

3 Gregor, Peter, Newell, Alan F. and Zajicek, Mary "Designing for Dynamic Diversity - interfaces for older people" *Proceedings of the Fifth International ACM SIGCAPH Conference on Assistive Technologies* Edinburgh, July 2002

4 Hauer, Klaus, Specht, Norbert, Schuler, Matthias, Bärtsch, Peter & Oster, Peter "Intensive physical training in geriatric patients after severe falls and hip surgery" *Age and Ageing* 2002; 31: 49-57

5 Jette, Alan M., Rooks, Dan, Lachman, Margie, Lin, Ting H., Levenson, Claudia, Heislein, Diane, Giorgetti, Marie M. & Harris, B.A. "Home-Based Resistance Training: Predictors of Participation and Adherence" *The Gerontologist*, 38, 4, 412-421

6 Whitbourne, Susan Krauss *Adult Development and Aging: Biopsychological Perspectives*, John Wiley & Sons (2001)