Chapter 3
Intelligently Adaptive Mobile Interfaces for Older People

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ABSTRACT

Computer technology has been reported to pose significant usability problems for older users. Further usability problems have been encountered with small, mobile computing devices due to their size as well as age-related declines. This chapter focuses on the usability of mobile computing devices for older people by first employing target users in a study to establish the problems to be addressed when using Personal Digital Assistants (PDAs). The development of an intelligent mobile interface companion called MemorLane to support older people by adapting its presentation and multimodal output of life-cached data to address individual user preferences and physical abilities is then presented, followed by the results of a detailed user-centred evaluation with further target users. Results show that the adaptability to individual requirements and preferences leads to statistically significant improvements both in the usability of the mobile interface and in the levels of user satisfaction experienced.

INTRODUCTION

As people live longer and the world’s older population continues to increase rapidly new challenges have been posed to governments and society as a whole. How to cope financially is of major concern, and recent changes in retirement ages and pensions are evidence of pressures being faced. Of equal concern, however, is ensuring that older people can maintain quality lives, and remain independent for as long as possible. This is particularly challenging given the diversity of the older population in terms of their physical and cognitive requirements. The speed at which the world’s older population is increasing is set to continue for the foreseeable future. By 2034, the
UK’s older population will have increased from 16% to 23% (Older People’s Day, 2011). This sustained increase in the numbers of older people is evidenced throughout the world and places ever-increasing economic, social and health-care pressures on existing services.

In parallel with the growth in the older population is the increase in the use of computing technology in all aspects of everyday life. Many older people, however, are not adopting or fully utilising such technologies (Selwyn, 2004). Age UK (the amalgamation of Age Concern and Help the Aged) for example, reports that, in the UK in 2009, 60% of people aged 65 and over had never used the Internet; this equates to approximately 6 million people. Multiple reasons for this under-utilisation have been discovered. Often, it is simply a matter of choice, where older people actively choose not to use the technology because they don’t want to. Selwyn (2004) suggests the reason for many older adults’ ambivalence toward technology is that they perceive it as having little relevance to their daily lives. Another common reason relates to those who have tried to use it, but, having encountered many usability problems, either fear it or abandon its use altogether (Eisma et al., 2003; Fisk et al., 2004; Goodman et al., 2004; Zajicek, 2001). Computer technologies have been developed with the specific aim of assisting older people in their own homes often by supporting them with the tasks of daily life as the natural physical and cognitive declines of age take their toll. It has also been established that older people tend to be more willing to make use of computing devices and applications if they see a purpose for them (Selwyn, 2004).

This chapter presents the results of two studies conducted with older people. The first study established the usability issues associated with their use of a PDA. The results led to the design and implementation of an intelligent interface to adapt to meet each individuals’ physical abilities and interface preferences. The second study evaluated the usability of the interface itself using an application identified in the first study as one of popular interest – reminiscence. The work presented in this chapter follows the User Sensitive Inclusive Design (USID) software development methodology (Newell and Gregor, 2000) which ensures that older end-users are involved throughout the development process. USID comprises five stages: requirements analysis; system design; implementation; system testing and evaluation. These stages are described in the following sections.

**BACKGROUND**

Research has been conducted into how to assist and encourage older people to make use of available computer technology by making the technology itself more user-friendly and intuitive for this age group. In particular, much work has focused on encouragement to use the Internet and email due to the benefits inherent in information access and communication. For example, the European DIADEM project (Delivering Inclusive Access to Disabled and Elderly Members of the Community) involved researchers from the UK, Italy and Norway working together to assist older adults with online form access, completion and submission (Money et al., 2008). Hawthorn (2003) developed the SeniorMail application, an email system for novice, older users which includes a simplified interface. Many initiatives and organisations have been established to bridge the gap between older people and technology. Race Online 2012 is an example of a UK initiative which is aimed at making the UK the first nation in the world where every person can use the Internet. Race Online 2012 is supported by numerous partnerships (1041 partners to date) with government, industry, charities and individuals who have committed to help 1,910,703 people learn to use the Internet (Race Online 2012, 2011). One of the partners is Digital Unite (Digital Unite, 2011), a UK initiative which provides continuous support.