

# Mobile Technologies for Elderly People

**Muna S. Al-Razgan**

*Information Technology Department, College of Computer and Information Sciences, King Saud University, Saudi Arabia*

**Hend S. Al-Khalifa**

*Information Technology Department, College of Computer and Information Sciences, King Saud University, Saudi Arabia*

**Mona D. Al-Shahrani**

*Information Technology Department, College of Computer and Information Sciences, King Saud University, Saudi Arabia*

**Hessah H. AlAjmi**

*Information Technology Department, College of Computer and Information Sciences, King Saud University, Saudi Arabia*

## 1. INTRODUCTION

The mobile phone world is advancing with new technologies emerging each day. New phones with new features and applications are being developed. Small, thin phones with sophisticated menus and computationally powerful processors are dominating the marketplace. These phones are built with young generation in mind and did not consider senior adult.

New mobile technologies with complicated multimedia features and confusing applications are difficult for elderly people to use. In fact, elderly group is increasing in percentage and special technologies devices are being designed to address their needs. Senior people are interested in devices with large display screen, and with easy-to-read buttons. Primarily, what the elderly need is the basics of mobile device such as calling, texting and an ability to use it during emergency situations.

## 2. BACKGROUND

As people age, their capabilities start to decrease, such as declining of cognitive, sensory, and physical abilities, thus, they form a special user group (Zajicek, 2004). Recent research has suggested guidelines and requirements for mobile devices that fit the elderly

needs. Designers have bridged the cultural gap towards the elderly and kept these requirements in their minds while designing new technological devices.

Recently, the number of elder people has increased rapidly (Plaza, Martín, Martín, & Medrano, 2011). According to the United Nations statistics, it is projected that by 2050 elderly over 60 will account for around 20% of the world population. This fact signals the urgent need for designing mobile phones targeting senior adults (Massimi, Baecker, & Wu, 2007).

Senior people are interested in having mobile phones that help them feel safe and secure, keep them related with social activities and most importantly enable them to live autonomous and independent life in their homes (Plaza et al., 2011). Therefore, senior market has produced various mobile phones to tackle this growing population. These phones are available in the market from rubber-buttons to touch-based smart phones. In this article we present some of the available phones for seniors and explore some of the applications designed for their use.

The rest of the article is organized as follows: section 3 discusses the motivation behind this article. Section 4 presents some of the available hardware and software technologies. Section 5 illustrates research projects targeting elderly people. Section 6, concludes the article with discussion. And section 7 will present future research directions.

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### 3. MOTIVATION

The use of mobile phone became essential role in today's societies for both young and old people. However, as people get older their mental and functional capabilities start to decline gradually. Elderly might have difficulties reading small text-messages in small-screen mobile devices. They might also have difficulties when pressing buttons as they might suffer from arthritis. Dialing or remembering close relative phone numbers is an obstacle for elderly who suffer from dementia due to attention and memory-loss. These are some of the many issues elderly are facing when using cell phones.

As we have indicated previously, the number of elderly is increasing at a steady pace around the globe, and the need for a mobile device that address their needs become necessary for today's market. Many projects were devoted to study and investigate the important factors to include when designing mobile devices or applications for elderly, and these studies where adapted by the elderly market.

There are various kinds of hardware and software devices designed and introduced in the marketplace. In this article we will demonstrate some of the hardware and software available in the market and recent projects designed for elderly (Kobayashi, Hiyama, & Miura, 2011).

#### Technologies and Research Projects

Mobile Technologies play an important role in supporting and maintaining older people life's in many ways as they provide a sense of security and safety for senior citizen. For example a study had been performed by (Hardill & Olphert, 2012) to explore mobile phone usage among older people in UK, and found that there are two kinds of elderly; one group, use mobile phone to complement landline when they are out, another group, use advance applications in mobile phones as an essential device in everyday life.

Older people like to obtain an easy to use cell phone with special features that fit their needs.

A study by (Kurniawan, 2008) revealed that older people fear the use of a new technology and preferred the use of mobile phone with aid features to support their declining abilities. Also (Kurniawan et al., 2006) found out that older people have strong opinion about some of the advanced features presented in mobile

phones such as: the use of one button to lock the cell phone, a panic button for emergency, a screen with only four menus (voice call, text, alarm, and calendar), and button to place unwanted people in the blacklist.

Recent research has been carried out to address older populations needs (Li, Zhao, Jiao, & Korhonen, 2012). Researchers gathered functions and features for designers to take into account when building new devices for seniors e.g. (Sulaiman & Sohaimi, 2010) and (Massimi et al., 2007). Similarly, (Kobayashi et al., 2011) focused on touch-screen devices for elderly. They found that touch-screen devices are generally easy to use by elderly. In addition, (Al-Razgan et al., 2012) conducted a thorough literature survey of the usage of touch-screen devices among elderly people. They distilled and consolidated a set of design recommendations and guidelines classified into three dimensions, namely: (1) Look and Feel, (2) Functionality and (3) Interaction.

In the next section, we present some of the various technological developments introduced in terms of hardware and software to help senior people cope with the new stream of mobile devices.

### 4. TECHNOLOGIES

Technologies used in mobile phones can be classified into hardware and software technologies. Hardware technologies constitute variant kinds of designed mobile phones devoted for the use by senior adults. On the other hand, Software technologies integrate various launchers or applications developed with elderly requirements in mind for touch-based mobile phones. Next, we discuss in further details these two technologies.

#### Hardware Technologies

To improve older people usability of mobile phones, special purpose-hardware devices are needed (Olwal, 2011). Senior market is trying to design cell phones devoted for the special requirements of older people such as easy to use phones that have a clear user interface which avoids cluttered menus; or lightweight cell phone that has larger buttons along with larger text display, louder ring tone, and an emergency button. This section will illustrate some of these hardware products available in the market.

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