

Chapter 5

CommunicaME: A New Proposal for Facilitating Communication Using NFC

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ABSTRACT

In a society that is clearly influenced by new technology, new advances in mobile technology have yielded important changes in the way users interact with information systems and contextual information. There is a need to provide technological solutions that help users communicate more easily. In this chapter, a novel solution that makes it easier for the elderly to use mobile phones is proposed. The senior population is rapidly growing; they represent 16-17% of the total population in developed countries. The use of a mobile device presents two large obstacles for this group: problems from disabilities due to age and problems associated with the lack of familiarity with mobile technology. The combined use of contactless technologies such as NFC and MiFARE eliminates the barriers encountered by older individuals. These technologies make it possible to use basic services of a mobile telephone, such as placing a call or sending a message, in a way that is easy, user friendly, and intuitive. The CommunicaME system makes it possible to place a call or send a SMS on a mobile by simply moving it closer to a contactless tag. The use of contactless technologies helps the user to carry out their daily tasks, and it also provides a new method of mobile communication that is both quick and secure. The results obtained with the defined and implemented prototype are presented in this chapter.

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INTRODUCTION

Recent years the use of mobile telephony and mobile terminals has been widely integrated into modern society; they have seen an exponential growth that has surpassed 100 lines for every 100 inhabitants. Only in Spain had 109 lines for every 100 inhabitants (Comisión de Mercado de las Telecomunicaciones, 2010). Subgroups of the population, such as the elderly, are often excluded from accessing technological advances, primarily because of the barriers encountered in their use (del Arco Carabias & San Segundo Encinar, 2010; Al Mahmud, Mubin, Shaid, & Martens, 2008; Kurniawan, 2007).

One of the main problems for this subgroup are associated with the lack of familiarity with the mobile technology itself (Pavon & Casanova, 2006), although the difficulties experienced by these individuals are primarily derived by the actual characteristics of the terminals (small screens, shortcuts, touch screens, etc.).

If we consider that the subgroup of seniors is very high in all developed countries, this exclusion supposes a serious problem. Now in Spain the group of seniors citizens is already nearing 20% of the total population; also in a few years the number of people older than 65 in the United States will reach nearly 16% of the population; and in Asia, and specifically Singapore, it will reach nearly 18% within just over a decade (Keating, Nagai, Hadder, & Kowalsky, 2007; del Arco Carabias & San Segundo Encinar, 2010; Hix, 2011; Been-Lirn Duh, Yi-Luen Do, Billingham, Quek, & Chen Hsueh-Hua, 2010). So a high number of individuals could not use the most basic mobile services offered by the mobile devices, such as making a call or sending a message. Our society is concerned about the problems caused by the lack of adaptation to technological advances among seniors and programs are proposed to solve. For example, in Europe exists the AGE¹ platform whose ambit of operation includes a component specific to TICs. Also Spain has the Advancement Plan²

that contains a proposal that would encourage the use of TICs (Information and Communication Technologies) among citizens aged 55 years and older.

This chapter presents a new proposal for facilitating the mobile communication for elderly. It is CommunicaME and it is a system that makes the communication more accessible through the use of a mobile telephone for senior citizens. For this subgroup of population, the simply task of writing a short message or searching the contact list for a telephone number is very complicate (Pavon & Casanova, 2006). The objective of this system is to provide a simple solution to this problem, and ensure that sub-groups of the population with difficulty adapting to mobile technology can place a call or send messages in a simple and intuitive way. This can be achieved by using contactless technologies such as NFC (Near Field Communication) (Roebuck, 2011; Finkenzeller, 2010), RFID and MiFare³. The combination of these technologies allows for the identification of objects and actions associated with these objects. A mobile device with NFC can identify an action that needs to be performed, such as sending a message or placing a call, by moving the mobile closer to an object containing an associated RFID or MiFare tag that represents these actions. Once the action has been identified, the same mobile device uses another MiFare tag to identify the person with whom one wishes to communicate.

In this chapter, in the next section, it is reviewed every area related with the project, such as, the problems that elderly have in accessing TIC; after that, it is described the contactless technologies used in this work as well as techniques for voice synthesis and recognition used to improve the accessibility of the system. Followed this, it is described the proposed solution and also it is explained a detailed presentation of the experiments that were carried out with the CommunicaME system with an emphasis on the results obtained. Finally, the conclusions are presented together on the innovative approach of this proposal.

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