Biomedical Engineering
and Elderly Support

Antonis S. Billis, Lab of Medical Informatics, Aristotle University of Thessaloniki, Thessaloniki, Greece
Evdokimos I. Konstantinidis, Lab of Medical Informatics, Aristotle University of Thessaloniki, Thessaloniki, Greece
Vicky Zilidou, Lab of Medical Informatics, Aristotle University of Thessaloniki, Thessaloniki, Greece
Kush Wadhwa, Global Security Intelligence, London, UK
Aristea Kyriaki Ladas, South-East European Research Center, Thessaloniki, Greece
Panagiotis D. Bamidis, Lab of Medical Informatics, Aristotle University of Thessaloniki, Thessaloniki, Greece

ABSTRACT

The undoubted growing percentage of senior population (age 65+) has been obvious in the modern society during the last few decades. Ambient Assisted Living (AAL) technologies arise as a promising means of elderly care, thereby reducing both carers’ workload and public health services costs. LongLastingMemories, an EU funded project, aimed at alleviating senior people mental and physical health problems by integrating state of the art computer-aided technology and prolonging their independent living by providing a smart home solution. Five rounds of multicentric pilots were planned and conducted in order to test that objectives such as accessibility, user acceptance and perceived effectiveness of the service were met by the final LLM prototype. A questionnaire survey was conducted after each pilot with several stakeholders, such as senior subjects and formal careers, proving the wide acceptance of our service and its applicability in the domain of elderly healthcare.

Keywords: Accessibility, Ambient Assisted Living (AAL), Carers, Long Lasting Memories, Mild Cognitive Impairment, Pilot Study, Qualitative Survey, Seniors, User Acceptance

INTRODUCTION

The provision of qualitative healthcare services has always paid attention to the human dignity and mostly to human life. Recently a lot of changes had occurred regarding the trends of the healthcare domain. One of the most prevalent changes that had taken place is the growing population of elderly people. According to the United Nations population division report, there is a significant increase of elderly people in Europe and according to
estimations the number of people aged 80+ (80 or older) will be 4.4% in 2050, while nowadays observed to be 1.6%. In addition by the year of 2050, the number of people in the Europe aged 65 and older is estimated to grow by 70% (United Nations Populations Division). Greece is one of the EU countries that with the highest proportion of older adults (65+) as compared to the nation’s entire population. This conclusion stems from data residing in the European Commission statistical services. More specifically, according to Eurostat, Greek people aged 65 or older represent 18.9% of the country’s total population in 2010 (15% was the representing percentage back in 1995). By the year of 2030, it is expected that elderly people in Greece will represent a much larger portion of the society, with estimates rising up to 24% (General Secretariat of National Statistical Service of Greece, 2005).

Another interesting feature that deserves attention is independent living and family structure. The change in the living arrangements of the Greek elderly over the last few years was dramatic: according to the Greek Household Budget Survey (General Secretariat of National Statistical Service of Greece, 2012), the percentage of elderly people living independently, single or as couples, has increased from about 46 per cent in 1974 to 68 per cent in 1999. Intergenerational co-residence has traditionally been a significant source of family support for elderly people. By co-residing with their adult children, the elderly can enjoy financial and social support, companionship and personal care. In the latter half of the 20th century, there was a substantial decline in the percentage of elderly people who lived with their adult children.

Population ageing has major implications on health services, employment and society as a whole (Daniilidou et al., 2003). Elderly health has been associated with specific patterns of morbidity, chronic non-contagious diseases comprising most of the cases. The heavier burden of disease among the elderly population in high-income countries is considered to derive (in descending order) from ischemic heart disease, cerebrovascular disease, depression, Alzheimer’s disease (and other forms of dementia), lung and respiratory tract cancers, hearing loss, chronic obstructive pulmonary disease, diabetes mellitus, alcohol abuse and osteoarthritis (Lopez et al., 2006).

All these statistics reveal the need for an integrated system care in order to improve health and quality of life focusing exclusively on older people. The major challenge in the near future will be to care for healthy and active aging worldwide by enabling older people to live longer in their home environment, thus keeping their independence as well as reducing costs to public health and social care systems.

One is lead towards this direction when information and communication technology (ICT) is used within the health care system, thereby contributing to better and more efficient health care services for all, and especially elderly people (Celler et al., 2003). The aging population is a major challenge for human societies; this may be tackled by recent developments in information and communication technology (ICT) in order to assist independent living of the elderly, while maintaining quality of life and confidence. Due to the significant increase in demand for health care for the elderly, we can expect a strong demand for Assistive Technologies Living - both to reduce the unit costs of home care and to facilitate the work of informal caregivers, and sometimes to replace the last one with objects of ICT. The early indications show that if used correctly e.g. tele-health systems can deliver a 15% reduction in Accidents & Emergency Units visits, a 20% reduction in emergency admissions, a 14% reduction in elective admissions, a 14% reduction in bed days and an 8% reduction in tariff costs. More strikingly they also demonstrate a 45% reduction in mortality rates (Bamidis et al., 2011; Health, D.o., 2011).

In this paper we discuss how services built during an EU-funded project, namely Long Lasting Memories (LLM), may act as an integration platform of existing technological achievements in the field of computer-aided physical/cognitive training of elderly as well
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