

Chapter 30

A Conceptual Framework for the Design and Development of AAL Services

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ABSTRACT

A digital environment with a pervasive and unobtrusive intelligence able to proactively support elderly people in their daily lives, enabling them to live independently for longer, and reducing the need for long term care is the fundamental idea of the Ambient Assisted Living (AAL). After considerable research investment, there is a good understanding of the domain problem. However, the need to broaden the scope of problems being addressed is undeniable. Ecological approaches for design and development of AAL services are required in order to reinforce a strong focus on people. The chapter presents a comprehensive model based on the International Classification of Functioning Disability and Health (ICF) to characterize users, their contexts, activities, and participation, and to structure a semantic framework for AAL services.

INTRODUCTION

Ambient Assisted Living (AAL) deals with new paradigms where computing devices are spread everywhere (ubiquity) to allow the human being, in particular elderly people, to have intelligent and natural interactions with the physical environments.

The AAL research requires a shift to address important but often neglected issues associated with the everyday practice (Bell & Dourish, 2007). Furthermore, it is consensual that AAL solutions are not useful if they do not combined health and social services, and informal cares from relatives, friends and neighbors.

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Within this context, we stand that comprehensive models of the individuals and their context are needed and have the potential for advantages in terms of the adequacy of the development of AAL services. The main goal of the paper is to argue that the International Classification of Functioning Disability and Health (ICF) can be used as a comprehensive model for the design and development of AAL services for older adults.

This paper is divided into: (1) this introduction; (2) a background section, where we contextualize AAL concepts and present the active ageing perspective and ICF; (3) an overview of the AAL technologies; (4) our position, where we present the ICF as a framework to define and describe ALL services, and to characterize users, their contexts, activities and participation; (5) future research directions; and (6) conclusion.

BACKGROUND

Over the last decade, considerable research efforts have been pursued by the European Commission, national governments and relevant industries to provide an adequate technology response to the challenges of an ageing society.

AAL is currently one of the important development areas, where accessibility, usability and learning play a major role and where future interfaces are an important concern for applied engineering (Kleinberger, Becker, Ras, Holzinger & Müller, 2007). The growing political importance of AAL is evident by the AAL Joint Programme, the initiative taken by the European Union with several Members States (July, 2008) in order to obtain synergies in terms of management and financial resources by ensuring a single common evaluation mechanism with the assistance of independent experts (European Parliament, 2008).

The general goal of AAL solutions is to apply the Ambient Intelligence (AmI) concepts and technologies to enable elderly people, or other people with specific demands, to live longer in their natural environment. In technological terms,

AAL comprises a heterogeneous field of applications ranging from quite simple devices such as intelligent medication dispensers, fall sensors or bed sensors to complex systems such as networked homes and interactive services.

Therefore, AAL solutions have high demands on the accessibility, usability and suitability of the developed services: user acceptance and support of natural user interaction are absolute necessities (Kleinberger, Becker, Ras, Holzinger & Müller, 2007).

Active Ageing

The AAL concerns and developments are in line with the World Health Organization (WHO) active ageing perspective (WHO, 2002). To overcome the pressures resulting from the demographic ageing, WHO argues that governments, international organizations and civil society should promote active ageing policies and programmes. Active ageing depends on a variety of influences or determinants that surround individuals, families and nations related with personal characteristics, culture and gender, but also with societal characteristics and infra-structures (e.g. physical environments, support services or social and economic contexts).

The main goal of active ageing is to promote the social participation of elderly people, while providing them with adequate care, protection and security. In terms of individual perspective, the three basic pillars of active ageing are (WHO, 2002):

- **Participation:** Full participation in socio-economic, cultural, spiritual and civic affairs, according to basic human rights, capacities, needs and preferences.
- **Health:** Access to the entire range of health and social services that address the needs and rights of the elderly.
- **Security:** Protection, dignity and care in events that elderly people are no longer able to support and protect themselves.

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