

USER CENTRED DESIGN IN AN FP7 ELDERLY PROJECT

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Abstract

The paper focuses on the user centred design approach that has been applied in the FP7 funded project OASIS where end-users (elderly) are involved in various stages of the development, thus pushing the technological advancements. The outcomes will be piloted in 6 countries, with the close cooperation of local elderly associations. The paper will outline the various steps of end-user identification that took place, and its usage in the project.

Keywords : e-Inclusion, elderly, user centred design

INTRODUCTION

OASIS (Open architecture for Accessible Services Integration and Standardization - www.oasis-project.eu) is a Collaborative Project (Large-scale Integrating Project – IP) that introduces an innovative, ontology-driven, open Reference Architecture and System, through which over 12 different types of services are connected with the OASIS System for the benefit of the elderly, covering user needs and wants in terms of Independent Living Applications (nutritional advisor, activity coach, brain and skills trainers, social communities platform, health monitoring and environmental control), Autonomous Mobility and Smart Workplaces Applications (elderly-friendly transport information services, elderly-friendly route guidance, personal mobility services, mobile devices, biometric authentication interface and multimodal dialogue mitigation and other smart workplace applications). OASIS thus addresses through this vast array of services the daily needs of elderly, ranging from those who are still active and continue to work, to those that are living independently but can use support to make their daily activities less cumbersome.

This required an in-depth understanding of the elderly that would be involved in the piloting of the OASIS services (scheduled to start in June 2009), since they will have to provide the requirements for the OASIS services. Before going to the actual categorisation of OASIS's users group, it is of utmost importance that we

understand the concept of “older people, elderly, etc.”. Who do we mean with that? Do we talk about the person of 89, living in an elderly house or in a supervised service flat? Or do we talk about the guy next door who is 67, but is still working in a law firm?

DEFINING THE STAKEHOLDERS

As starting point, we took into account that OASIS targets older people who experience mild cognitive and physical impairments due to ageing, while supporting them in having an independent life as long as possible. Equally however, OASIS aims at supporting them in having an active life. Therefore, while “elderly” has conventionally been defined as a chronological age of 65 years old or older, and those from 65 through 74 years old are referred to as “early elderly” and those over 75 years old as “late elderly”ⁱ, this definition is not satisfactory as it disregards the capabilities of the individual by only looking at the age aspect.

We considered a number of approaches, which were assessed, and then decided on the way to proceed within the project.

SHARE approach

The Survey of Health, Ageing and Retirement in Europe (SHARE) captures the three phases of the life after the age 50 as following: pre-retirement, post-retirement, and oldest age (80+):ⁱⁱ

- **Phase 1** is the time before retirement. Most are married; many have their

children still at home; often they are working. Labour force participation is an important aspect of their lives.

- **Phase 2** is the time after retirement. Most are still married; it is an active and mostly healthy time with some travelling, especially for the well-to-do. Savings and consumption pattern change with the transition to retirement.
- **Phase 3** represents the oldest old. Diversity is largest, in particular concerning health and how they cope with old age and frail health.

EUROSTAT approach

Above phases match more or less the categories of elderly people as are defined by EUROSTATⁱⁱⁱ:

- Older workers (55-64)
- Elderly people (65-79)
- Very elderly people (80+)

Why this barrier of 50? A number of EU projects, such as SHARE, ESAW (European Study of Adult Well-Being”) and SeniorWatch surveys revealed that most of the population aged 50 and older are receiving medication for at least one long-term condition.^{iv} Therefore, it is suggested that the group of ageing people should starts at 50+. This is as such again a more medical, rather than an activity based approach.

SOPAAL approach

While the above criteria are directly linked to age, we suggest to also focus on a segmentation based on functional capabilities of persons aged 60+ as presented in below table^v.

Segment	2004	% Population	% of 60+
GO-GOES (“independent performers”)	1.3 million	16%	72%
SLOW-GOES (“independent survivors”)	0.33 million	4%	18%
NO-GOES (“supported retirees”)	0.18 million	2%	10%

Such segmentation is directly linked with what services within OASIS these users will use because they have different needs depending on their abilities.

If we look at these Austrian figures, we notice the high percentage of the 60+ that still belong to the “independent performers”. This is also confirmed with findings by EUROSTAT which demonstrate that a large proportion of the people aged 50-65 are working. In the EU25 the employment rate for those aged 55-64, reached 41,0%, up from the 36.6% registered in 2000. The employment rates

of people aged 55-64 range from 26.2% in Poland to 69.1% in Sweden.^{vi}

ICF approach

Another way to indicate the level of activity is to consider the International Classification of Functioning, Disability and Health (ICF). The ICF is the World Health Organisation’s (WHO) framework for measuring health and disability at both individual and population levels.^{vii} Based on the available ICF outline^{viii}, the ICF component *Activities and participation* is relevant for OASIS, together with its 9 chapters and relevant subchapters. This ICF component (Activities and Participation) is then quantified, using following generic scale:

- xxx.0 NO problem (none, absent, negligible,...)
- xxx.1 MILD problem (slight, low,...)
- xxx.2 MODERATE problem (medium, fair,...)
- xxx.3 SEVERE problem (high, extreme, ...)
- xxx.4 COMPLETE problem (total,...)
- xxx.8 not specified
- xxx.9 not applicable

This approach is very useful to provide the granularity needed if we have to identify participating end-users during the piloting phase. To make this however workable, we introduced a **simplification** of the chapters based on the linkage with the specific OASIS applications that are relevant to them, while also assigning the various subchapters accordingly:

Component: Activities and Participation

Chapters:

- 1. Knowledge acquisition and application on a daily basis, through daily routine tasks, etc.
 - WP2.4 Brain and skills trainer
 - 1.1 Purposeful sensory experiences
 - 1.2 Basic learning
 - 1.3 Applying knowledge
 - 1.4 Undertaking a single task
 - 1.5 Undertaking multiple tasks
 - 1.6 Carrying out daily routine
 - 1.7 Handling stress and other psychological demands
- 2. Mobility within and outside the house

- WP2.3 Activity Coach
- WP2.7 Environmental control
- WP3.2 Elderly friendly transport information services
- WP3.3 New, elderly-friendly route guidance
- WP3.4 Personal mobility
 - 2.1 Changing and maintaining body position
 - 2.2 Carrying, moving and handling objects
 - 2.3 Walking and moving
 - 2.4 Moving around using transportation
- 3. Self-care (hygiene) and domestic life
 - WP2.2 Nutritional Advisor
 - WP2.6 Health monitoring
 - 3.1 Washing oneself
 - 3.2 Caring for body parts
 - 3.3 Toileting
 - 3.4 Dressing
 - 3.5 Eating
 - 3.6 Drinking
 - 3.7 Looking after one's health
 - 3.8 Acquisition of necessities
 - 3.9 Household tasks
 - 3.10 Caring for household objects and assisting others
- 4. Overall communication and use of supporting devices, interpersonal interactions and relationships, and social and civic life activities
 - WP2.5 Social communities platform
 - 4.1 Communicating - receiving
 - 4.2 Communicating - producing
 - 4.3 Conversation and use of communication devices and techniques
 - 4.4 General interpersonal interactions
 - 4.5 Particular interpersonal relationships
 - 4.6 Community life
 - 4.7 Recreation and leisure
 - 4.8 Religion and spirituality
 - 4.9 Political life and citizenship

- 5. Work and employment
 - WP 3.5 Smart workplaces applications
 - 5.1 Education
 - 5.2 Work and employment
 - 5.3 Economic life

For each of the chapters, a more meaningful scale system was suggested for each activity function:

- 0= No limitations
- 1= Slight limitations
- 2= Moderate limitations
- 3= Severe limitations
- 4 = Total limitations

Based on the above, we rate e.g. a person with slight limitations in work and employment as 5.2.1. This simplified framework will now be used when identifying the various pilot users. However, this detailed approach is not workable for all elderly that were to be interviewed to collect end-user requirements. For this we still looked for a “super level” that grouped elderly, taking into account their skills and abilities. The AGILE approach provided this classification.

AGILE approach

According to the AGILE classification^{ix}, 3 subgroups can be identified:

- **‘Young’ Elderly:** ages 55-65, i.e. people who are healthy and, in most cases, can still lead busy and active lives, but who have just started to experience slight deteriorations in their quality of life due to ageing.
- **Elderly:** ages 65-75, i.e. people who are healthy, but are more likely to experience mild cognitive and physical problems due to ageing.
- **‘Old’ Elderly:** ages 75+, i.e. people who are very likely to experience cognitive and physical deteriorations due to ageing.

It was therefore decided that the AGILE classification will be used, however taking into account that the 3 categories each consist of a number of subcategories (defined by ICF) that are linked to the grade of activity and abilities, thus also resulting in OASIS services that will match with various subgroups within the groups as defined by AGILE.

For a good operation of the project in terms of considering the needs of the pilot users, a subjective approach will be needed to allow for an individual categorisation of the users that will be involved. This will optimally take into account a number of factors and conditions such as past life and work experience, psychological age, health status, mobility, geographical location, employment, socio-economic factors, marital status, educational background, etc. In this respect, the simplified aforementioned classification (based on the ICF classification) will be considered for the detailed identification of the pilot users.

UNDERTAKING INTERVIEWS

The AGILE approach was applied to group the elderly to be interviewed. During the months May-July 2008 interviews took place in Bulgaria, Germany, Greece, Italy, Romania and the UK. In total, almost 500 interviews were conducted.

In Bulgaria, the team of Marie Curie Association undertook almost 100 interviews with participants from the elderly care house in Glavinitza village –Pazardzhik-, the daily care home for elderly people in Plovdiv and Sliven, and people who live alone in Plovdiv, Sliven and Panagiuorishte. These interviews have been analysed, and will form the basis for defining various use cases, user scenarios, as well as influence technical decisions that will have to be taken for the development of OASIS services (such as e.g. the high usage of mobile devices by Bulgarian elderly).

For the Bulgarian pilot, the simplified framework will be used to describe the involved end-users, taking into account as such their age, but also their (functional) abilities.

CONCLUSION

The exercise that has been undertaken in the context of OASIS project aimed at outlining the end-user groups that OASIS is addressing, but more importantly, provided a good understanding of the heterogeneous elderly group. This understanding is crucial to ensure user requirements are collected from a representative enough end-user group, while also preparing the ground for the dissemination and the exploitation activities toward the end-user and stakeholder groups.

ⁱ As mentioned in the "Geriatrics & Gerontology International", Volume 6 Issue 3 Page 149-158, September 2006, "Reviewing the definition of "elderly" , Hajime Orimo, Hideki Ito, Takao Suzuki, Atsushi Araki, Takayuki Hosoi, Motoji Sawabe

ⁱⁱ As mentioned in "Health, Ageing and Retirement in Europe, First Results from the Survey of Health, Ageing and Retirement in Europe", April 2005, Page 19, Edited by Axel Börsch-Supan (Coordinator), Agar Brugiavini, Hendrik Jürges, Johan Mackenbach, Johannes Siegrist, Guglielmo Weber.

ⁱⁱⁱ As mentioned in the "Green Paper Confronting a Demographic Change: A New Solidarity between the Generations", prepared by the European Commission, Brussels, 16.3.2005

^{iv} As mentioned in "User needs in ICT Research for Independent Living, with a Focus on Health Aspects", Report on a joint DG JRC/IPTS-DG INFSO workshop held in Brussels, 24 – 25 November, 2005, Gérard Comyn (HoU), Silas Olsson and Rainer Guenzler, DG INFSO/H/1 Rukiye Özcivelek, Dieter Zinnbauer and Marcelino Cabrera, IPTS, European Communities, June 2006

^v As mentioned in "SOPAAL - Feasibility Study on Socio-economic Parameters to Support a National Implementation of AAL in Austria", Lisbeth Mosnik, as featured in MST News, nr 6/07, December 2007, page 8

^{vi} As mentioned in EUROSTAT, news release, 112/2005 - 8 September 2005, based upon a report published by Eurostat, the Statistical Office of the European Communities, which on its turn was based on the results of the 2004 Labour Force Survey (Eurostat, Statistics in focus, Population and social conditions, 9/2005 "Labour Force Survey – Principal results 2004.").

^{vii} As mentioned on <http://www.who.int/classifications/icf/en/>.

^{viii} <http://www.who.int/classifications/icf/site/onlinebrowser/icf.cfm>

^{ix} Sascha Breker et al, AGILE Deliverable 1.1 'Problems of elderly in relation to the driving task and relevant critical scenarios', March 2003]

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