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PROJECT N°: AAL-2010-3-093

## D1.3: GoldUI INITIAL USER REQUIREMENTS

**Start Date of Project :** 18/07/2011      **Duration :** 24 months

PROJECT FUNDED BY THE AAL JOINT PROGRAMME	
Due date of deliverable	M6
Actual submission date	31 <sup>st</sup> January 2012
Organisation name of lead contractor for this deliverable	XIM
Author(s)	XIM
Participant(s)	HIB, FESALUD
Work package	WP1 – User Involvement
Classification	Internal
Version	1.0
Total number of pages	36

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## Glossary

Acronym	Meaning
<b>IMSERSO</b>	<b>Instituto de Mayores y Servicios Sociales. Institute for Older People and Social Services.</b>

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## 1. Executive summary

This report is part of the GoldUI deliverables produced within the context of WP1 User Requirements for the GoldUI system. The aim is to identify the range of requirements for all potential users of such a system and to determine the key knowledge requirements of the carers and users in the project's research groups. The approach that this document adopts is to identify the key problem scenarios in each pilot case that GoldUI can address within the User environments to help define its functional and non-functional requirements. The more general constraints and considerations are also described. This includes a description of main users characteristics, needs, abilities, knowledge about the technology to be used, preferences and technical descriptions of the main GoldUI solution, services, and devices. This Deliverable D1.3 Initial User Requirements will try to refine the descriptions of the personas and solutions and to synchronize them with related tasks in other WPs in the GoldUI project.

After a brief introduction, we will explore user and carer characteristics and then go on to discuss user awareness and current use of devices and ICT, the barriers they experience and their attitudes towards adopting a system designed for ease of use specifically for older people.

From there we will move on to describing detailed user requirements designed to dovetail with what is technically feasible to such a degree of detail that will enable developers to do their work within a well-defined framework or 'scenario' and which also enables researchers working with potential end-users to gain feedback at a detailed level, and so the process will be re-iterated in future deliverables, therefore refining a synthesis of user needs with what's practical and feasible.

Following this in section 5, we define the feature sets and then move on to describe system configuration and personalization by the carer, before moving on to the Non-functional Requirements, namely the list of devices on which the GoldUI service will be delivered. Finally this document reviews the standards and best practice issues before a brief summary and next steps.

## 2. Introduction

This report is part of the GoldUI deliverables produced within the context of WP1 User Requirements analysis for the GoldUI system. The approach that this document adopts is to identify the key problem scenarios that GoldUI can address within the user environments to produce an initial definition of its functional and non-functional requirements. The more general constraints and considerations are also described.

This document uses and builds on the results of the other deliverables in the work package, namely:

- D1.1 User Involvement Plan
- D1.2 GoldUI Use Scenarios

It is also planned that the user requirements identified within this document will be further refined in light of consultations and feedback from the users' and carer's comments and thoughts on the system specifications and early prototypes, to be documented in the final user requirements D1.4. It is being written in parallel with the development and specification of the D2.1 Early Prototype and the work on user requirements will be continued so it can inform those that will succeed it as second and final prototypes.

WP1-Task1.3 set out to describe a specification of the characteristics, needs and preferences of potential end-users. In order to develop the first prototype, we need to identify end users needs and preferences in order to shape the architecture and select, prioritize and configure the online services. Part of this process is to identify the best devices, design the user interface and identify best real-life use scenarios.

In this deliverable we summarize the information obtained through diverse sources described in the previous document D1.2 GoldUI Personas and Scenarios. This D1.3 document should help identify many of the initial user needs for the GoldUI solution regarding usability and accessibility of interfaces, devices and services. It will also address technology acceptance by carers and end-users, including those barriers that limit acceptance. We will also consider solutions to reduce barriers and promote use, as well as exploring users' and carers' knowledge about devices, the social context, and the perceived utility of the solution. Customization, adaptation and social effectiveness testing will be done down the line after testing the first prototype.

### 2.1. *Purpose of this document*

Building on the results of the above deliverables, the purpose of this document is to enrich the four user scenarios, identify an initial feature set and non-functional user requirements. These requirements and the other WP1 deliverables will be feed into the Prototyping workpackage 2, which in turn will assist in end user trials leading to the creation of the final User Requirements (D1.4) at month 12.

Users will be and already have been involved in a co-design process. On the one hand, the needs will be refined within a group of specialist carers with extensive knowledge about end-users and groups of end-users' needs. Some of these needs may be important but not visible solely by observation simply because the end-users cannot express them or they are unaware of them. For this reason, we must apply a methodology that facilitates the detection and management of these needs. As a result, user requirements will be more realistic.

### 3. Main characteristics of users

In order to ascertain our end users needs, and as described in D1.1, we engaged a substantial number of people. A total of 60 people were engaged including professionals, outreach and ICTs, promoters, caregivers and final users to obtain the most accurate and comprehensive information regarding older peoples' attitudes and needs regarding:

- Their use and acceptance of technology
- Their needs and preferences for services GoldUI could potentially provide
- To identify end-users who will participate in the following phases.

These following secondary and tertiary end-users were approached to create the personas and scenarios for GoldUI as described in D1.2:

- Outreachers and experts of the Guadalinfo Public Internet Access Centers - Living Labs
- Formal caregivers with a strong drive to promote independent living among their constituents. (Medical doctors, social services, others...)
- Informal caregivers.
- Final users

#### 3.1. *Guadalinfo Centers: Spanish Users in the south of Spain.*

The Guadalinfo Public Internet Access Centers have access and experience with more than 600,000 users in the territory. The majority of users who attend Guadalinfo Centers are living in small rural areas or semi rural areas and have not had a lot of exposure to ICT technologies in the past. However, they represent a growing number of older people in the area who are willing to start interacting and using these technologies in order to improve their lives. This has been possible though the effort that the Consorcio Fernandez de los Rios, a public supported institution responsible for setting up these centers and promoting learning and use of ICT among the elderly in Andalucía.

The **main characteristics** of these users are as follows:

**Age:** Range 60 and 75 years old

**Gender:** Men and Women (with different percentages according to age and centre)

**Educational attainment:** low and low-medium

**Living status and networks:** the majority of them are married and live with a spouse although there are some who live alone. In the majority of cases children live in the surrounding areas. Most of friends or family members live in their towns or villages.

**Health status, disabilities:** The majority of them have a good health status and mobility with some minor problems such as the need for reading glasses, short memory problems or slight mobility problems. Many engage in daily low impact sport activities such as walks and gymnastics.

**Personality, behaviour:** The majority of people are conservative in their views and appearance, pleasant, with good disposition for learning. Among women there is a tendency to be less confident about their skills and ability to learn new things, although they seem to be more enthusiastic about using ICT for improving their lives and that of others.

**Interests:** Contrary to beliefs and stereotypes about older people in rural areas, our users have a wide range on interests. The main interests include learning about new places, meeting new

people, learning new skills, improving their knowledge about things of their cultural interests and hobbies (photography, reading, crafts, sports, traditions, etc.)

**Long term and short term goals:** There is a consensus among users that the main long term goal is to maintain themselves as active as possible both physically and mentally and to maintain their lifestyles as they are without complications. Short term goals include getting to know other people and places and improving their lives through the use of ICTs, using them to connect to other people, make new friends, meet new places, learn new things and reduce the amount of time they use in regular chores such as dealing with the administration, medical care and others.

### *3.2. Costa del Sol: Foreign residents in the south of Spain*

A high percent of elderly foreign residents in the Costa del Sol, although in contact with relatives in their countries of origin, live alone. Some of them live with their spouses but their children, other relatives and most of their friends live abroad. Many of them do not spend the whole year in Spain but they stay for long periods with short trips to their countries of origin. Many of them do not speak Spanish and are sometimes limited in their mobility and safety. These older people have an advantage over the Spanish population of the same age, in that they tend to be familiar with ICT technologies.

The **main characteristics** of these users are the following:

**Age:** Range 65 and 80 years old

**Gender:** Men and Women (with different percentages according to age and area or residence)

**Educational attainment:** medium to medium-high

**Living status and networks:** a high percentage of them live alone, and some are living with a spouse. In the majority of cases children live abroad. Most of friends or family members live abroad and their networks are considerable smaller than the ones of their Spanish counterparts.

**Health status, disabilities:** The majority of them have good health status and mobility with some minor problems such as the need for reading glasses, short memory problems, using hearing aids, etc. There are a percentage that already have lower mobility and some chronic health conditions. Many engage in daily low impact sport activities such as walks.

**Personality, behaviour:** This population is very mixed in terms of views, personal appearance, clothing etc., not as conservative as the Spaniards and not as expressive or lively as they are. They usually are practical people who know what they want and are more demanding about their needs, expected services and the “way things should be”, compared to Spaniards. Women are as confident as men regarding their skills and ability to learn new things and are usually very enthusiastic about the use of new technologies to improve their lives.

**Interests:** This population is not a homogeneous one but they tend to have multiple interests including learning about new places, meeting new people, learning new skills, improving their knowledge about things of their cultural interests and hobbies. They have a special interest in getting to know the Spanish culture, go to new places, learn about traditions, history, gastronomy etc. Their varied interest reflects their higher educational attainment.

**Long term and short term goals:** For foreign resident in Spain maintaining a long healthy and active independent life is the most important goal. Short term goals include getting to know other people and places and improving their lives through the use of ICTs using them to

connect to other people, make new friends, meet new places, learn new things and reduce the amount of time they use in regular chores such as dealing with the administration, medical care and others just like their Spanish counterparts, although their interest differ.

### 3.3. *Caregivers characteristics.*

The socio-care system that deals with dependency is complex and variable throughout Spain. There is not as such an integrated socio-care system in the country caring for people with disabilities, elderly and other dependants. Basically the social security system, the social services system, the health system and many other organizations are responsible for care giving. They are divided into a decentralized structure of 17 autonomous regions, 50 provinces, and more than 8,000 municipalities in charge of providing the service. The recently enacted Law for the Promotion of Personal Autonomy and Care for Dependent Persons (2006) will constitute a substantial change to the current situation. This is leading to an improved right to care entitlement throughout the autonomous regions.

Spain is 0.6% below the average for OECD countries, spending 1.25% GDP on caring for dependants. Even though, today 66.9% of disabled people receive some form of help. IMSERSO (2005) undertook an investigation into the carers who came from outside of the family and found that they represented only 2.5% of the total of the informal care available. The informal care giver is the main person (sometimes the only one) that is responsible for the daily care and support of the older person, providing help due to illness or disability, so that they may remain independent or semi-independent.

The **main characteristics** of these users are the following:

**Age:** Range 55 and 70 years old

**Gender:** The majority are women.

**Educational attainment:** low-medium, medium to medium-high, high

**Living status and networks:** a high percentage of them live with the person they care for, and sometimes they have other family members they are responsible for, like children use. In the majority of cases children live abroad. Most of friends or family members live abroad and their networks are considerable smaller than the ones of their Spanish counterparts. .

**Health status, disabilities:** The majority have a good health status and mobility but according to age they may have some minor problems such as the need for reading glasses, short memory problems, using hearing aids, etc. Their main complaints are usually burnout, anxiety and depression.

**Personality, behaviour:** This population is very mixed in terms of views, personal appearance, clothing etc. They also vary in their personality traits and ways to confront life and life challenges. The majority are usually under a lot strain to take care of their day to day problems and the additional burden of taking care of an ailing person in the family. They usually do not take care of themselves and their main focus is the person they are taking care off. Their main interest is to find ways to improve the care they are giving while improving their lives, increasing their free time and finding some help and respite. They believe new technologies could help resolve some problems but are unaware of how. They are usually enthusiastic about the use of new technologies to improve their lives, but think they may not have the time to learn about them.

**Interests:** This population is not a homogeneous one but they tend to have multiple interests including learning about new places, meeting new people, learning new skills, improving their

knowledge about things of their cultural interests and hobbies. Their main interest is helping people, and finding ways to do so in a most effective way.

**Long term and short term goals:** Long term goals are maintaining health and capabilities as long as possible to take care of their family member and improve their lives. Short term goals include getting better services, reducing their anxiety, improve their social network and relations, and reduce the amount of time they use in regular chores such as dealing with the administration, medical care and others to better manage their time.

## 4. Technology use, knowledge, barriers and services

We asked users about their knowledge, use and intend to use ICT devices and services. Tables 1 through 3 describe the percentage of positive responses to the following questions:

1. Are you familiar or do you know these devices/technologies?
2. Have you ever used any of these technologies of devices?
3. Would you be interested or willing to use these technologies/devices in the future?

### 4.1. Knowledge about technology

The majority of users are familiar with the most popular devices and with internet. Responses from the Spanish users regarding Digital radio should be taken cautiously because the majority thinks a digital radio is just a normal radio but with digital numbers. The majority does not know what a smart TV is, only foreign residents and caregivers are knowledgeable of Smartphones and, given the cautious note on digital radio, the majority is not familiar with the device. We have to be aware this is not intended to be a representative sample of the whole population but it gives us an idea of what we need to provide in order to increase knowledge and interest to use these devices and the opportunity of new services that these devices could bring.

**Table 1 - Users' knowledge about ICT devices and services**

		<b>Guadalinfo Centers</b>	<b>Costa del Sol</b>	<b>CUDECA</b>
		<b>Spanish users</b>	<b>Foreign Resident users</b>	<b>Caregivers</b>
<b>Devices</b>				
	LCD TV	100%	100%	100%
	Smart TV	0%	0%	0%
	PC	100%	100%	100%
	Ipad	50%	100%	100%
	Mobile Phone	100%	100%	100%
	Smartphone	0%	100%	75%
	Radio	100%	100%	100%
	Digital Radio*	75%	0%	0%

	MP3	100%	100%	100%
	MP4	100%	100%	100%
	Video	100%	100%	100%
	Hi-fi system	100%	100%	100%
<b>Services</b>				
	Internet	100%	100%	100%

**Table 1 Users' knowledge about ICT devices and services**

*\* Note: The majority of user thought that a digital radio was a radio with digital numbers versus analogue numbers.*

## 4.2. Technology use

Table 2 shows the percentage of positive responses over technology use in general, without asking details on frequency, expertise or type of use. Again this is not intended to give information on a representative sample of the population but to have an idea on the use of technology by our main target users. It shows the need to introduce the technology to users before introducing any of the GoldUI solutions.

Table 2 - ICT device and service use by Users				
		<b>Guadalinfo Centers</b>	<b>Costa del Sol</b>	<b>CUDECA</b>
		<b>Spanish users</b>	<b>Foreign Resident users</b>	<b>Caregivers</b>
<b>Devices</b>				
	LCD TV	75%	100%	100%
	Smart TV	0%	0%	0%
	PC	75%	100%	100%
	Ipad	0%	0%	0%
	Mobile Phone	80%	100%	100%
	Smartphone	0%	0%	0%
	Radio	75%	100%	100%
	Digital Radio*	50%	0%	0%
	MP3	0%	100%	0%
	MP4	0%	100%	0%



	Video	100%	100%	100%
	Hi-fi system	25%	100%	100%
<b>Services</b>				
	Internet	75%	100%	100%

Table 2 ICT device and service use by Users

### 4.3. *Intend to use technology*

Table 3 shows the percentage of positive responses on the question ¿would you use the following devices/technology in the future if given the opportunity? Again, people will not use devices they are not familiar with or use devices they perceive are not different of what they already have. For example, older people are unaware of the advantages of the smartphone over the mobile phone nor are they familiar with the applications and services it can provide, therefore, they would not buy or use such a device, especially if you can get a mobile phone for free with your service versus spending 500 or 600 € on a new device developed for “young people”.

Table 3 - Intend to use ICT devices and services				
		<b>Guadalinfo Centers</b>	<b>Costa del Sol</b>	<b>CUDECA</b>
		<b>Spanish users</b>	<b>Foreign Resident users</b>	<b>Caregivers</b>
<b>Devices</b>				
	LCD TV	100%	100%	100%
	Smart TV	50%	75%	50%
	PC	75%	100%	100%
	Ipad	75%	75%	0%
	Mobile Phone	100%	100%	100%
	Smartphone	50%	50%	50%
	Radio	75%	100%	100%
	Digital Radio*	50%	0%	0%
	MP3	50%	75%	0%
	MP4	50%	75%	0%
	Video	100%	100%	100%
	Hi-fi system	25%	100%	100%



Services				
	Internet	75%	100%	100%

Table 3 Intend to use ICT devices and services

#### 4.4. Major barriers to using technology

As already described in D1.2 and earlier in this document, there are several barriers to use that need to be taken into account. The following is a list of these barriers that we will have to tackle in developing the GoldUI system.

- **Knowledge:** most of users are not knowledgeable about the devices that we will use or about how the “solution” looks and can do for them. Many are not knowledgeable about the possibilities that new technological solutions can bring to their lives and are not capable of expressing the desired services because they lack the necessary information of all services available.
- **Attitudes:** The majority, even though enthusiastic about trying new technologies feel they are developed for younger people, are “fashion toys for the rich”, feel they will not be able to acquire the necessary skills to use it, that the new devices/technology does not improve the ones they are using know or being concern about security or confidentiality issues, among others.
- **Behaviours:** Older users tend to maintain their routines and fixed ideas about how to do things, what works for them, what does not, what are their priorities, and so on. A significant percent has declared that their main goals are to keep the ways their lives are, without complications.
- **Goals:** Many users’ long term goals are basically to maintain health, active long lives. They do not really see how technologies can help them attain that goal. They are more knowledgeable on what technology can do for their short term goals such a meet new people or get better information because they have been exposed to those solutions either though the media, family members or ICT outreach workers.
- **Usability problems:** Older people have some problems when using ICTs and specially internet services that are not obvious to more experience users, among them we can find the following:
  - Pop ups distract and bewilder older people
  - They block out when they encounter a Flash introduction sequence or infinite loop, especially if they cannot find the link to the contents of the page which is not evident or visible
  - They get confused with the scroll bar
  - They get lost while surfing the web
  - Physical disabilities such as eyesight problems, psychomotor activity, coordination, ergonomic problems, cognitive problems, etc.
  - Most of the perceived short memory problems are not such, the majority comes from a decrease in attention spam capability when distracted with too many stimuli. Therefore solutions need to be clean of those distractions in order to be effective.
  - Most need help when they encounter minimal problems with PC use or use of other devices, they get confused with the technological jargon and need help from family or friends. If family or friends are not available for help, they will not use the technology.

Other barriers include: lacking the infrastructure (i.e. not having internet at home), not being able to afford the new devices (PC, Smartphones, smart TV), not being able or willing to pay for services (internet fees).

#### 4.5. *Services. What services will be useful? The problem of not being aware of the possibilities*

We have asked about the possible services users would be interested in. Interests are varied and range from maintaining and improving social and family relations, networking and getting to know new people to obtaining help with administration chores, health related help with doctors appointments, keeping up with medications needs to improving leisure activities and travel. The next section considers the feedback from users and carers in the light of what is possible by current and new emerging technology. We have explored many different features which we hope will benefit users and carers, but it will be very important to research these features with users and carers so we ensure we only develop prototypes which meet peoples' real needs.

#### 4.6. *More detailed User Scenarios*

In D1.2, we developed User Scenarios from the research work that was done with potential users and carers. When we add the possible technically feasible features which are outlined later in this document, we get a more detailed imaginary model of what we hope to achieve with a GoldUI service. The blue text below has been added to the D1.2 Scenarios:

<b>Scenario ID# 1</b>	Enhanced social relationships within the community and getting personalized information
<b>Author(s)</b>	Isolde Gornemann, Alberto García, Coralie Vasquez
<b>Scenario description</b>	
<p>Elena, Maria, Carmen, Pedro and Juan have been going to the Guadalinfo Center to learn about GoldUI and how to get in touch with new people who have the same interests. They have signed up and created a profile with their personal data and choices (<a href="#">see a detailed description of how they do this in the caregiver's set-up in section 4.7</a>). They think that the system will allow them to stay in contact with family, friends and neighbours and get to know new people who share their interests. They feel that it would also be a good way of being informed about events in their community.</p> <p>Even though Juan does not like to contact people through Facebook, he has found a new trekking group who meets every week for special trekking trips around the area, connecting through GoldUI with the city hall web site. He has now joined the web site blog and enjoys keeping up with news, sharing photographs and planning new trips with his new friends. Through this group he has met Pedro who also found the group and joined through GoldUI. They are now planning to organize joint adventures around their areas and are setting up a gymnastics group.</p> <p>Elena and Maria are very happy they met and that they share a common group which pursues increasing awareness on cultural opportunities in rural areas in Malaga through</p>	

GoldUI. Even though they are far away from their group counterparts, they enjoy having new friends and being able to get information about cultural activities, historical facts, art and traditions of other towns and villages around the region. Elena and Maria are planning to prepare a cultural and gastronomic event in their villages with the help of the City Hall to show their friends the historic, cultural, artistic and gastronomy “jewels” of their town. They feel very happy to put their skills to work to promote tourism in their towns and feel that this idea would not have come up without them engaging in the GoldUI project.

Anna ([for more details about Anna's experience, see the next scenario](#)) is very happy with her new GoldUI service. After some hesitation about trying the solution (she did not feel this was for her, because she could navigate well and felt she had no problems getting the information she needed), she has found out that now she can get all the news from very different sources (different national and international papers) and organized them according to her needs without having to look for them one by one on the net. She gets all the different perspectives on the news that are relevant to her just at a glance and can choose to read what she wants without getting lost. She is now able to print or save an article in a much easier and organized way so she can go back to her sources when she wants to post a political comment or opinion in the forums in which she is active.

<b>Scenario ID# 2</b>	Shopping through the net? Controlling my bank account from home? Not for me...or maybe yes!
<b>Author(s)</b>	Isolde Gornemann, Alberto García, Coralie Vasquez
<b>Scenario description</b>	
<p>Elena and Maria never thought they could feel at ease looking up and interacting with their bank accounts from home through the net. They always prefer to go to their local bank and talk to the people face to face to pay their bills and to withdraw money. They always feared banking through the internet was not safe and was too complicated to bother with. Too many numbers, passwords and requirements made it difficult for them. They could not imagine that after using GoldUI they would control their bank account from home or even make payments in an easy and safe way. It all started when their new-found activities with their cultural group made them use Paypal to pay some services for a cultural event they organized in a nearby town. Through their Guadalinfo centre they asked for help setting up the system and it worked without any problem! Since then, they not only have their own Paypal account but interact with their bank through internet on a daily basis using their GoldUI account. <a href="#">To do this, each of them simply access the GoldUI home page which is a simple 4-button menu showing four icons in the quadrants of the screen. This can be done on either their digital radio, tablet, Smartphone or SmartTV. From the GoldUI homepage, they can select the ‘Bank’ icon in order to listen to their current balance or hear/read a short mini-statement.</a></p> <p>Carmen loves to read, she has many interests and enjoys reading in front of the fire at home. Unfortunately, the little stationary shop in her town only sells a few books and does not have a great selection. Carmen is aware of the famous Amazon internet shop and knows about</p>	

some good Spanish bookstores that also sell through the net. She goes to the Guadalinfo Center asking for help on this issue. After some trials Carmen is able to set up her Paypal account and feels safe using it. Carmen is really happy now that she got over her fear of shopping through the net and gets her favourite books delivered right at her door. From the same 'Shopping' screen she can now access her Bank account details, Carmen can now access Amazon through GoldUI, which has been set up in her preferences by her daughter. She is now confident enough in online shopping to have some of her supermarket items delivered to her home, as well as clothing from her favourite outfitter.

Stina is a little worried about her husband's health. He just came back from the hospital after hip surgery. He feels OK but has some pain and is not able to move much. She has found out she did not have any time to go to the shop for groceries. A good thing she can access her GoldUI account through her PC (or smart TV) and do her shopping, even getting the best offers of the day. After paying through her Paypal account on GoldUI she is happy she can stay at home to take care of her husband.

Anna is planning to spend the holidays in Germany. It is about time she visits her son and granddaughters! She gets connected to her GoldUI account to get the best holiday travel offers and finds a low fare air ticket just in time. Now, she remembers she needs to get some nice presents to take with her but needs to go to her dentist appointment in a nearby town that same afternoon. She browses through to find a nice music shop in the town where she needs to go for her appointment and finds a good offer on CDs and Movies for her granddaughters, she also finds out they open late so she will be able to do her shopping after her dentist appointment! Later that night she comes back home with her new presents and sends a mail to his son telling him she will be there for Christmas.

<b>Scenario ID# 3</b>	Remembering daily tasks, getting alerts and staying informed through digital devices.
<b>Author(s)</b>	Isolde Gornemann, J. Alberto García, Coralie Vasquez
<b>Scenario description</b>	
<p>Anna loves her new digital radio! It looks just like a normal clock/radio showing the time digitally and it even has adjustable brightness so it is not too bright in the middle of the night, but can be easily read by day. Now she can get up with the music she loves instead of that terrible alarm sound. Before getting up and just with a touch on the screen of her new digital radio she gets a summary of the news and weather from her local radio station. With another touch on the screen, Anna is able to see and even listen to a list of her appointments for the coming day. It is very useful to be able to hear the appointments because Anna's eyesight is not so good, which means she needs spectacles and sometimes she can't easily find them, especially if they've fallen from the bedside table. Anna has heard that the GoldUI service will soon be able to work from voice commands and Anna thinks this is such a valuable feature, she will benefit greatly. Anna decides to get out of bed and when dressed, she picks up the</p>	

digital radio and carries it downstairs to continue listening to the news.

Later, she will review on her smart TV all the news and get information and different opinions according to the position of the newspapers through her GoldUI account. With a touch on the remote control she opens the GoldUI home menu which is a simple 4-icon menu overlaid across the bottom of her TV screen. With a click on the 'Reminders' icon, Anna sees a second reminder of the chores for the day. Today Anna sees she has a doctor's appointment and some others, and a reminder to take her medication.

Anna prepares her breakfast and gets ready to go out. Today is market day on a nearby town where she likes to shop for her fresh vegetables and flowers. On her way to the market, her GoldUI Smartphone rings and vibrates to indicate she has a text message. She touches the screen to hear the message. It is her friend Stina to tell her they have an invitation from their common friend Carmen, who's birthday it is that same afternoon. That reminds her she needs to get some fresh flowers in the market today. She responds to Stina with a voice message and tells her to get a birthday cake for Carmen. Later on that afternoon they enjoy a good laugh around the coffee table.

#### 4.7. Case study 4 – the Caregiver

<b>Scenario ID#4</b>	The Caregiver using the GoldUI messaging system
<b>Author(s)</b>	Isolde Gornemann, J.Alberto García, Coralie Vasquez
<b>Scenario description</b>	
<p>It is early morning and Carol has set up the GoldUI system on her mother's digital radio and on the TV after preparing breakfast.</p> <p>Carol logged into the GoldUI setup page from her PC Laptop and was helped through the process by the very clear questions and choices which all seemed relevant to her mother's needs and situation.</p> <ul style="list-style-type: none"> <li>Firstly she rated her mother's abilities for her eyesight, hearing, motor skills, dexterity and technical confidence with digital devices, SmartTV and radio.</li> <li>Next she completed the section about interests and activities, family and friends, starting with tick boxes for the ways her mother kept in touch by: <ul style="list-style-type: none"> <li>Telephone</li> <li>SMS</li> <li>Letters</li> <li>Emails</li> <li>Sending photographs.</li> </ul> </li> <li>The following section was about 'Learning' and asked "Is your mother interested in taking courses, either at home or locally? Then there were questions about her interests and skills which would allow the GoldUI system to identify possibilities for courses and groups of similarly interested people in the local area.</li> </ul>	

- Next there was a section to complete about her mother's calendar and reminders for remembering daily tasks, getting alerts and staying informed through digital devices.
  - Wake up call and choices:
    - Alarm
    - Music
    - Radio
    - Other (eg recorded message?)
  - List of appointments for the day ahead
    - Appointments for the day ahead and choices of when received.
    - With wake-up call
    - When turning on tv
    - Hourly reminder of list
    - List on demand
  - Reminders of appointments and schedules
    - Choice of device, means and time before reminder message
  - Advance reminders of Birthdays and other occasions, giving enough time to plan presents etc.
  - Doctor/dentist/nurse/hospital appointments
  - Activity and Entertainment schedule reminders
  - Short-term entertainment and leisure reminders Things to do at home today list
  - Bills to be paid
  - Books to be returned to the library
  - Other scheduled activity according to the end-user's and carer's needs
- The next section was about Device availability and preference:
  - Which of the following devices does your mother have in her home?
  - i) [Smart tv][iPad][digital radio][Smartphone][Landline]
  - ii). select which model / capability
  - iii). which does she prefer to use (rank in order of preference)?
- The system then asked about preferences for interaction and also "Which way would your mother prefer to receive prompts?"
  - audio alerts
  - icons
  - text
- Security and accounts was the subject of the next section which advised "Please create a Google or Facebook account for your mother, then come back to this section to add GoldUI as a login using these details. (This way, your mother will only need to remember one password, or we can even set up a simple 4 digit PIN in GoldUI to allow her to login to all services.)"
- Money matters followed with questions like "Is it important to her/her mother to check her mother's bank account daily/weekly/monthly?"
- The next important section was about Health and wellbeing:
  - Does your mother need to visit her GP regularly? if so, who is your mother's GP?
  - Does she need to collect regular medication? if so, who is her pharmacist?
- Then there was an optional 'Health and Social Care' section with opportunities to access



information about:

- Healthy living information
- Healthy cooking recipes (according to elderly eating restrictions like low salt, low fat, rich of calcium) with a possibility to update shopping lists with missing ingredients.
- Care services available locally and financial assistance with healthcare
- Finally, there was a section for Carol herself as a carer which asked her about her own preferences for contact by and about her mother. She selected her Smartphone for receiving alarms and messages from her mother and from the CUDECA centre.

The system is **now** connected with her phone to receive any alarms or messages and is also connected with the CUDECA centre. Now Carol feels better about leaving her home secure in the knowledge that if something happens to her mother she will know about it and be able to respond promptly. Before leaving that morning, she makes sure everything is in order and the system is ready for her mother to use. **She knows the battery levels for the digital radio and the SmartTV remotes are sufficiently charged, because GoldUI sends reminders to her when any device battery is low, so she feels secure in that. She also makes sure both devices are switched on and ready at the GoldUI homepage for her mother to use.**

She needs to go out to do some errands and to solve some administrative problems in order to receive her widow's pension, something that may take more time than expected.

While standing at the line in the City Hall office, she gets a phone call from home. She picks it up, her mother is feeling uneasy; she is not really having problems but feels a little anxious, this is the first time she is alone without Carol being at home. Carol talks to her and calms her down; reassuring her that if she feels bad she can always use her digital radio to connect to the emergency system at CUDECA, a nurse would be sent immediately, and she will also be informed something is wrong with her. She tells her mother she will be home in an hour.

After finishing at the City Hall, Carol goes to the supermarket to pick up the groceries she bought on line the night before through her GoldUI account. On her way to the supermarket she receives an alarm warning her that her mother's medication has been changed earlier that morning by the doctor, and is now ready for her to pick up at the pharmacy near home.

She sends a message to her mother letting her know she will be going to the pharmacy and will be a little late. Her mother receives the voice message through her smart TV interrupting her favourite program for a few seconds. Her mother feels relieved that somehow, even when Carol is not home, she is not alone. Carol goes back home with a feeling of having better control of her time and having reduced greatly her anxiety about leaving the house and her mother alone.

## 5. GoldUI Initial Feature Sets

These initial features are a list of possibilities that can be made available with varying degrees of technical difficulty. It is important to know how much end-users and carers value these potential features so that we can concentrate development resources on the things people really value. It is also good to know which particular features they would value more than others.

The project is working at this level of description for functionality and requirements as it helps to clarify communications with the target users and avoids confusion of referring to more detailed-level functional requirements.

**These initial features have been classified into several feature sets according to their functionalities so that end-users and carers can identify easily what feature sets and sub-sets value more. The main feature sets are the following:**

- **Feature Set A – Socializing and personalized information** in order to enhance social relationships and get personalized information about events, travels, etc.
- **Feature Set B – Shopping and banking** in order to shop different things via Internet and control the bank account from home.
- **Feature Set C – Reminders** in order to remember daily tasks, get alerts and stay informed through digital devices.
- **Feature Set D – Health and social care** in order to get information about a healthy life and available care services.

Next, these feature sets are explained in more detail in the following tables:

Feature Set A Socializing and personalized information	
A1	<ul style="list-style-type: none"> <li>• Getting in touch with new people who have the same interests               <ul style="list-style-type: none"> <li>○ Creating a profile with their personal data and preferences</li> <li>○ Communicating on the internet with new contacts</li> <li>○ Planning new trips and organizing new groups</li> </ul> </li> </ul>
A2	<ul style="list-style-type: none"> <li>• Being informed about events in each user's local community               <ul style="list-style-type: none"> <li>○ Entertainment and leisure opportunities</li> <li>○ Church services and helpful spiritual information</li> </ul> </li> </ul>
A3	<ul style="list-style-type: none"> <li>• Being informed about travels planned by IMSERSO (Institute for Older Persons and Social Services) or similar organizations</li> </ul>
A4	<ul style="list-style-type: none"> <li>• Being better educated about local culture and places of interest</li> </ul>
A5	<ul style="list-style-type: none"> <li>• Being educated about volunteer opportunities for elderly (to be grandparents for kids, senior companion for frail elderly, senior tutors for elementary students,</li> </ul>



	helping in charity events, local fairs, etc... )
<b>A6</b>	<ul style="list-style-type: none"> <li>Being better informed, having more alternative perspectives and being more organized with the news (for example, having easy access to local news).</li> </ul>
<b>A7</b>	<ul style="list-style-type: none"> <li>Social networking via GoldUI               <ul style="list-style-type: none"> <li>Easy-access Facebook</li> <li>Family and close friends contact</li> </ul> </li> </ul>

**Table 4 Feature Set A – Socializing and personalized information**

<b>Feature Set B – Shopping and banking</b>	
<b>B1</b>	<ul style="list-style-type: none"> <li>Home Banking or simply balance-checking?</li> </ul>
<b>B2</b>	<ul style="list-style-type: none"> <li>Home shopping via the internet and payment via Paypal</li> </ul>
<b>B3</b>	<ul style="list-style-type: none"> <li>Most recently bought shopping list and the best value online retailers</li> </ul>
<b>B4</b>	<ul style="list-style-type: none"> <li>Travel tickets – buying online</li> </ul>
<b>B5</b>	<ul style="list-style-type: none"> <li>Downloading purchased movies, TV programmes, books etc.</li> </ul>
<b>B6</b>	<ul style="list-style-type: none"> <li>Online bartering and swapping goods websites.</li> </ul>

**Table 5 Feature Set B – Shopping and banking**

<b>Feature Set C – Reminders</b>	
Remembering daily tasks, getting alerts and staying informed through digital devices	
<b>C1</b>	<ul style="list-style-type: none"> <li>Wake up call and choices:               <ul style="list-style-type: none"> <li>Alarm</li> <li>Music</li> <li>Radio</li> <li>Other (eg recorded message)</li> </ul> </li> </ul>
<b>C2</b>	<ul style="list-style-type: none"> <li>List of appointments for the day ahead               <ul style="list-style-type: none"> <li>Appointments for the day ahead and choices of when received.</li> <li>With wake-up call</li> <li>When turning on tv</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Hourly reminder of list</li> <li>○ List on demand</li> </ul>
<b>C3</b>	<ul style="list-style-type: none"> <li>• Reminders of appointments and schedules               <ul style="list-style-type: none"> <li>○ Choice of device (eg mobile), means (eg SMS) and time before reminder message (eg 30 minutes)</li> </ul> </li> </ul>
<b>C4</b>	<ul style="list-style-type: none"> <li>• Advance reminders of Birthdays and other occasions, giving enough time to plan presents etc.</li> </ul>
<b>C5</b>	<ul style="list-style-type: none"> <li>• Doctor/dentist/nurse/hospital appointments</li> </ul>
<b>C6</b>	<ul style="list-style-type: none"> <li>• Activity and Entertainment schedule reminders (eg days out with friends, trip to the movies, weekly workshops of arts/photography ...)</li> </ul>
<b>C7</b>	<ul style="list-style-type: none"> <li>• Short-term entertainment and leisure reminders (eg favourite TV programme is on in 15 minutes)</li> </ul>
<b>C8</b>	<ul style="list-style-type: none"> <li>• Things to do at home today list (eg put out the garbage, water the plants, take medication, cooking, house work, etc... )</li> </ul>
<b>C9</b>	<ul style="list-style-type: none"> <li>• Bills to be paid (electricity, telephone, ...)</li> </ul>
<b>C10</b>	<ul style="list-style-type: none"> <li>• Books to be returned to the library</li> </ul>
<b>C11</b>	<ul style="list-style-type: none"> <li>• Shopping List</li> </ul>
<b>C12</b>	<ul style="list-style-type: none"> <li>• Other scheduled activity according to the end-user's and carer's needs.</li> </ul>

**Table 6 Feature Set C – Reminders**

Feature Set D – Health and social care	
<b>D1</b>	<ul style="list-style-type: none"> <li>• Healthy living information</li> </ul>
<b>D2</b>	<ul style="list-style-type: none"> <li>• Healthy cooking recipes (according to elderly eating restrictions like low salt, low fat, rich of calcium) with possibility to update shopping list with missing ingredients</li> </ul>
<b>D3</b>	<ul style="list-style-type: none"> <li>• Care services available locally and financial assistance with healthcare</li> </ul>

**Table 7 Feature Set D – Health and social care**

## 6. GoldUI configuration and personalization

### 6.1. *Trusted carer creates and manages account*

A key design principle for GoldUI is to encourage a trusted carer to create an account and set up a highly tailored configuration for the end user.

The carer will most likely be a son or daughter, but could also be a professional assigned to the user.

It is important that the carer has the authority and mandate of the end user to create and configure their account, as this may include handling sensitive financial and personal data, as well setting a password/PIN for the end user to access services such as banking and shopping.

### 6.2. *Evolving settings*

A second principle is that the settings should be routinely reviewed and updated as the needs of the end user evolve. For example:

- accessibility settings will need to be adjusted if the user's eyesight, hearing or motor dexterity deteriorates
- online access settings will need to be updated from time to time as banking and shopping websites change their security requirements
- new services may be added as the user desires access to new features.

### 6.3. *Ease of updating*

It is assumed that the carer will be more comfortable with technology, and the GoldUI setup process is likely to require access to a laptop or at least a tablet with standard browser in order to easily complete the forms required. However, this should be as easy as possible, especially to encourage frequent review and updating in line with the user's needs.

### 6.4. *Integration with leading services*

Another feature of the GoldUI configuration will be to make full use of existing email and social networking sites to leverage the functionality of these services and to give the user the benefit of staying in touch with family and friends.

These will include:

- Google – for email, calendar and contacts
- Yahoo! – alternative to Google for email, calendar and contacts
- Twitter – for sending and receiving short messages, both online and via SMS
- Facebook – for receiving messages and wall posts and keeping informed via newsfeed
- Flickr – for viewing family and friends' photographs
- YouTube – for viewing family and friends' videos.

## 7. Non-functional Requirements

In this section we will consider the hardware such as touch-screen digital radios, Smartphones, etc which make up the set of devices through which the GoldUI services will be delivered. A brainstorming meeting early in the project identified a range of devices which are either traditional and widespread such as standard TV's and landline telephones versus emerging devices such as iPads, digital internet radios, Smartphones etc. This list has been developed and extended and we are now considering:

- Smart TV
- Smartphone
- Digital Radio
- iPad
- STB (Set-top-boxes)
- Landline Phone
- PC

The key differences between these devices are:

- Portability
- Domestic / out-of-home use
- Screen size
- Input methods available (touch screen, keyboard, remote control, mic, web cam)
- Processor power (for capabilities such as voice recognition, gesture recognition).
- 

One of GoldUI's central benefits is that it optimizes the features each device carries in order to focus on the needs of older people, hence overcoming their concern that "New devices are always developed for young people and not for me."

We will now examine the different devices in detail:

### 7.1. TV and SmartTV

Most elderly people in Europe own a TV and as new SmartTV sets become cheaper and more widespread, use and acceptance by older people is likely to follow as long as manufacturers ensure standards and guidelines (as discussed in the following section) are put into practice.

Smart TV, which is also sometimes referred to as "Connected TV" or "Hybrid TV", (not to be confused with Internet TV or Web TV), is the phrase used to describe the current trend of integration of the internet and Web 2.0 features into modern television sets and set-top boxes, as well as the technological convergence between computers and these television sets / set-top boxes. These new devices most often also have a much higher focus on online interactive media, Internet TV, over-the-top content, as well as on-demand streaming media, and less focus on traditional broadcast media like previous generations of television sets and set-top boxes always have had. Similar to how the internet, web widgets, and software applications are integrated in modern smartphones, hence also the name ("Smart TV" versus "Smart Phone").

The technology that enables Smart TVs is not only incorporated into television sets, but also devices such as set-top boxes, Blu-ray players, game consoles, hotel television systems, and other companion devices. These devices allow viewers to search and find videos, movies, photos and other content on the web, on a local cable TV channel, on a satellite TV channel, or stored on a local hard drive.

**Main advantages:**

- Familiar technology
- Large screen giving great visibility
- Not restricted by the need for frequent re-charging and (except for remote controls which have very long battery life).

**Main disadvantages:**

- Restricted to one location in the home.
- Reliant on remote control for user input which can be confusing and the buttons unclear. This can be overcome by using a smartphone or tablet as remote control but adds complexity and “gadget count”.
- Unlikely to offer microphone for voice control.

## 7.2. *Smartphone*

Similarly to SmartTV, very few older people own Smartphones, although our survey in section 3.1 above suggests 50% intend to use such devices in the future.

A smartphone is a high-end mobile phone built on a mobile computing platform, with more advanced computing ability and connectivity than a contemporary feature phone. The first smartphones were devices that mainly combined the functions of a personal digital assistant (PDA) and a mobile phone or camera phone. Today's models also serve to combine the functions of portable media players, low-end compact digital cameras, pocket video cameras, and GPS navigation units. Modern smartphones typically also include high-resolution touchscreens, web browsers that can access and properly display standard web pages rather than just mobile-optimized sites, and high-speed data access via Wi-Fi and mobile broadband.

The most common mobile operating systems (OS) used by modern smartphones include Google's Android, Apple's iOS, Microsoft's Windows Phone, Nokia's Symbian, RIM's BlackBerry OS, and embedded Linux distributions such as Maemo and MeeGo. Such operating systems can be installed on many different phone models, and typically each device can receive multiple OS software updates over its lifetime.

**Main advantages:** mobility and potential for a wide range of applications for GoldUI Features.

**Main disadvantages:**

- Small screen and difficult for older people to touch small icons.
- Limited battery life – restricted by the need for frequent re-charging.
- Not as well accepted as TV and digital radio by the target audience.

## 7.3. *Digital Radio*

A new generation of digital radios is now available with touch-screens and internet accessibility which together with their Android capability makes them a good choice for GoldUI prototypes.

**Main advantages:**

- Good mobility (generally within the home)
- Some models include touchscreen, webcam and microphone for greater range of interface modalities
- Potential for a wide range of applications for GoldUI Features.

**Main disadvantages:**

- Better visibility than Smartphones, but still restricted in terms of a small screen
- Difficulty for older people to touch small icons.
- Also restricted by the need for frequent re-charging.

#### 7.4. *iPad and other tablets*

A tablet computer, or a tablet, is a mobile computer, larger than a mobile phone or personal digital assistant, integrated into a flat touch screen and primarily operated by touching the screen rather than using a physical keyboard. It often uses an onscreen virtual keyboard, a passive stylus pen, or a digital pen.

The term may also apply to a variety of form factors that differ in position of the screen with respect to a keyboard. The standard form is called slate, which does not have an integrated keyboard but may be connected to one with a wireless link or a USB port. Convertible notebook computers have an integrated keyboard that can be hidden by a swivel joint or slide joint, exposing only the screen for touch operation. Hybrids have a detachable keyboard so that the touch screen can be used as a stand-alone tablet. Booklets include two touch screens, and can be used as a notebook by displaying a virtual keyboard in one of them. In 2010 Apple released the iPad based on the technology developed in parallel with their previous iPhone, and reached worldwide commercial success.

**Main advantages:**

- Good mobility
- Potential for possibly the widest range of applications for GoldUI Features.
- Potential for many other useful applications such as watching movies, accessing games etc.

**Main disadvantages:**

- The screen size is a lot better than Smartphones, but still a bit restricted in terms of a small screen
- Difficulty for older people to touch small icons. GoldUI aims to overcome this.
- Also restricted by the need for frequent re-charging.
- Expensive.

#### 7.5. *Set-top-boxes (STB)*

A set-top box (STB) or set-top unit (STU) is an information appliance device that generally contains a tuner and connects to a television set and an external source of signal, turning the signal into content which is then displayed on the television screen or other display device. Set-top boxes are used in cable television and satellite television systems, to transform the signal from the cable or satellite to a form that can be used by the television set or other receiver.

**Main advantages:** Add to the capability of TVs

**Main disadvantages:** Tied to TVs therefore restricted to one location in the home.

#### 7.6. *Landline phone*

These are probably limited in value to a GoldUI system as mobiles and Smartphones are so much more versatile.

However, a landline can be used to call a voice + keypad service, which may be attractive to some users.

Smart cordless phones can offer similar features to a smartphone but use a conventional telephone landline rather than a separate mobile network, which may be attractive to a user not wishing to pay for two telephone contracts.

### *7.7. Personal computers*

PC's will be the main hardware devices for carers and users to do their GoldUI set up via their browsers.

It could also be possible for an end user to access their GoldUI setup via a browser. This may be useful for someone who has been given an old laptop by their family to keep in touch. The laptop could be setup to open directly to the GoldUI home page.

## 8. Standards and best practice

In D1.1 and D1.2, references were made to the large amount of research and other work which has been done to investigate and act upon the characteristics and needs of older people and we recognize the strong need for GoldUI to comply with existing standards and recommendations, particularly those publicized by W3C.

The World Wide Web Consortium (W3C) is an international consortium where organizations located all over the world and involved in many different fields join W3C to participate in a vendor-neutral forum for the creation of Web standards. Member organizations include technology companies, telecommunications companies, universities, government departments, and disability organizations. Member organizations, a full-time staff, and the public work together to develop open and royalty free Web standards.

Key web technologies developed are through a multi-stakeholder and consensus-oriented process. These technologies include HTML, CSS, XML, SVG, SMIL, and many more that are used by developers to create websites and web software.

W3C process and pursues accessibility of the Web for people with disabilities including older people who experience age related functional changes and are rapidly increasing as a proportion of the population in most countries through five primary activities:

- ensuring that core technologies of the Web (HTML etc) support accessibility
- developing guidelines for Web content, user agents, and authoring tools
- facilitating development of evaluation and repair tools for accessibility
- conducting education and outreach
- coordinating with research and development that can affect future accessibility of the Web.

A highly relevant document describing guidelines and standards is the Web Accessibility for Older Users: A Literature Review, W3C Working Draft 14 May 2008.

This document provides a review and analysis of guidelines and articles relating to the needs of older people with Web accessibility needs due to ageing, and compares these with the needs of people with disabilities as already addressed in WAI guidelines. The focus is particularly on Europe but applies internationally as well. This review is being undertaken in order to inform the development of educational materials which can better promote the needs of people who have accessibility needs due to ageing, and potential development of profiles and/or extensions on WAI guidelines.

Unfortunately, the “User requirements for an elderly Web user” section of this has not yet been written, but it does detail the WAI guidelines, as follows:

The W3C Web Accessibility Initiative has released several sets of guidelines to help make the Web more accessible to people with disabilities. These include guidelines relating to the presentation of content (Web Content Accessibility Guidelines), the accessibility of user agents, including browsers (User Agent Accessibility Guidelines) and the requirements of authoring tools, including blogs and online forums, for the creation of accessible content and for use by people with disabilities (Authoring Tool Accessibility Guidelines). As the Web has become an interactive medium, the interrelationships between the guidelines and the users become increasingly important to allow access to information and to allow the creation of information.

It is essential that the different components of Web development and interaction work together in order for the Web to be accessible to people with disabilities (and elderly people).



The draft WCAG 2.0 has twelve guidelines for accessible content (for further details see <http://www.w3.org/WAI/older-users/developing.html>) :

- 1.1 Text Alternatives: Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language
- 1.2 Synchronized Media: Provide synchronized alternatives for synchronized media
- 1.3 Adaptable: Create content that can be presented in different ways (for example simpler layout) without losing information or structure
- 1.4 Distinguishable: Make it easier for users to see and hear content including separating foreground from background
- 2.1 Keyboard Accessible: Make all functionality available from a keyboard
- 2.2 Enough Time: Provide users with disabilities enough time to read and use content
- 2.3 Seizures: Do not design content in a way that is known to cause seizures
- 2.4 Navigable: Provide ways to help users with disabilities navigate, find content and determine where they are
- 3.1 Readable: Make text content readable and understandable
- 3.2 Predictable: Make Web pages appear and operate in predictable ways
- 3.3 Input Assistance: Help users avoid and correct mistakes
- 4.1 Compatible: Maximize compatibility with current and future user agents, including assistive technologies

The draft ATAG 2.0 has seven principles:

PART A: Make the authoring tool user interface accessible

- A.1: Authoring tool must facilitate access by assistive technologies
- A.2: Authoring tool user interface must be perceivable
- A.3: Authoring tool user interface must be operable
- A.4: Authoring tool user interface must be understandable

PART B: Support the production of accessible content

- B.1: Production of accessible content must be enabled
- B.2: Authors must be supported in the production of accessible content
- B.3: Accessibility solutions must be promoted and integrated

The draft UAAG 2.0 has 5 principles:

- Follow applicable specifications and conventions
- Facilitate access by assistive technologies

Ensure that the user interface is perceivable

Ensure that the user interface is operable

Ensure that the user interface is understandable

At the guideline or principle level, it can be seen that most of these will be required in order for an increasing number of elderly to be able to access and interact with the Web in future. The detail within these guidelines tells Web site developers, Web application developers, authoring tool and blog developers, and browser and users agent developers, how to achieve this.

Also, GoldUI service has to assure interoperability with a wide range of technologies and services (from cloud-based services, to personalized access to multimedia contents, to online services etc...), together with its adherence to current standards.

Because of its multi-device feature, GoldUI service has to be interoperable with the majority of mobile technologies (from traditional mobile phones to the new generation of smart phones and tablets) and with the latest generation home radios and TV relying on IP protocol. Moreover, the interoperability of web services will be guaranteed by the presence of a web service gateway component.

GoldUI service will contribute in an important way to the open interfaces area, since the technologies will be deployed mainly in open source environments, such as, for example, the mobile platform that will be entirely implemented on the open source Android OS.

Because of the presence of multimodal interfaces that will allow the user to access the service from different modalities such as from display, keyboard, mouse, and speech, pen-based or haptic interfaces is an important component of GoldUI service, several Human Computer Interaction and Usability standards have to be respected as, for instance, the standard ISO 20282 that specifies the Ease of operation of everyday products and, in particular, the Design requirements for context of use and user characteristics. Furthermore, the standard ISO 9241-171 on the accessibility for human-computer interfaces will have to be observed as well since it covers issues associated with designing accessible software for people with the widest range of physical, sensory and cognitive abilities, including those who are temporarily disabled, and the elderly. These aspects will be addressed in Task 1.4 User Testing and the results of this task will be assessed in the document D1.5 Usability and Accessibility Report.

Regarding the content adaptation framework, one basic standard is the MPEG-7, that is a multimedia content description standard and it was standardized in ISO/IEC 15938 (Multimedia content description interface).

Since the personalization feature is one of the most important aspects of GoldUI service, the sensitive health related information stored in the User Profiles, recorded and managed during GoldUI project will have to be carefully handled. This will be guaranteed by the adherence to the guidelines specified in the ISO/IEC 27002 of Health informatics on Information security management in health.

## 9. Conclusions

### 9.1. *User needs and how the features seek to meet those needs*

The aim of D1.3 has been to identify the range of requirements for all potential users of the GoldUI system and to determine the key knowledge requirements of the carers and users in the project's research groups. It has drawn from and built on the previous work done in D1.2\_GoldUI Use Scenarios. One of the key issues for this and any similar projects and initiatives is the fact that many potential users and carers are not aware of the full potential of all the benefits that simple and easy facilitated access to ICT could deliver to them. For that reason, a set of scenarios has been developed, centered around these fundamental user needs:

- Enhanced social relationships within the community and getting personalized information

More specifically, we seek to investigate how we can help people to identify and meet up with people with similar interests and activities, therefore benefiting them by extending their active living opportunities with a new social group, thus giving them more independence from carers and healthier living possibilities for the mind, body and spirit.

- Shopping through the net and accessing users' bank accounts from home

To most of the adult population of Europe, internet shopping and banking is a convenience and often potentially money-saving fact we take for granted. However this is not the case for many older folks and while presently they may not see it as a 'need', we may convince them of the many benefits available through GoldUI enabled access.

- Remembering daily tasks, getting alerts and staying informed through digital devices

While this is a well-established need serviced by PC, mobile phone and other new devices entering the market, there is potential to significantly increase older peoples' access via a simple service.

Other very important user needs include:

- Carers can have more peace of mind when they have some assurance that their loved one has a reliable back-up plan.

Some relief from feeling responsible for the cared-one's appointments, social mobility and basic shopping needs is a real need for carers. They may also benefit from using all or part of the GoldUI system for themselves.

- Users have the opportunity to grow in confidence in accessing the internet with its myriad features, experiences and information.

It's also likely that the parallel benefit of becoming more confident using digital devices which potentially takes them deeper into what GoldUI and the internet in general can offer them.

#### 9.1.1. Next Steps

The consortium now needs to test the first prototype with users and carers to confirm and refine the user needs and also to incorporate any fresh ideas and perspectives which come from end-users and carers. The features list will be updated based on the feedback obtained from users and we will also continue to explore between the GoldUI technology partners what additional features may be technically feasible and which may be included in our next prototype iteration.

## 9.2. *Non-functional requirements*

We have evaluated hardware such as touch-screen digital radios, smartphones, and other devices through which the GoldUI services will be delivered. These have been assessed on their respective merits such as portability, their suitability for domestic and/or out-of-home use, their screen size and the input methods available.

One of GoldUI's benefits is that it optimizes each device's features to focus on the needs of older people, hence overcoming their concern that "New devices are always developed for young people and not for me."

### 9.2.1. *Next Steps*

Users will be able to try using a smart phone and smart tv to gain feedback and experience with the hardware. In addition we will be scanning the market to see if there are any new devices entering the market which may offer better accessibility than those currently available.

## 9.3. *Standards*

We have researched the wealth of standards material which has been documented and is available to help projects like GoldUI and we recognize the basic need to apply the relevant standards in all of our developments.

### 9.3.1. *Next Steps*

We will continue to monitor the situation and to identify any new standards in the project's remit.