WP2 – Concept, Requirements and Specification

D2.3: User Stories and Requirement Analysis

Deliverable Lead: ESE

Contributing Partners: ASC, ATOS, TEMP, CHA, AITEX, TUDA, OUD, TALK, TIE, IESE

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Short Abstract

The main objective of this deliverable is to define the functional requirements for the ALFRED system. This will be done by analysing the end-user requirements gathered from related literature and studies as well as from the ALFRED focus group sessions. Furthermore, the report includes the verified and improved ALFRED use cases and personas that are essential during the entire project.

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Project Partners

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Executive Summary

The main objective of this deliverable is to provide the ALFRED user stories that will be the basis for the ALFRED system architecture. These stories define both the functional and the non-functional requirements for the technical specification. In order to ensure that the ALFRED system meets the needs and demands of its intended users, the user stories are based on the findings from the ALFRED focus group sessions. Furthermore, an overview of existing user requirements in related projects enables us to verify the accuracy of our own findings as well as extend the information acquired from the ALFRED end-users.

The essential objective of the work in this deliverable is to investigate the users' opinions, needs and views. This process will lead to the verification of the ALFRED use cases and finally, to the definition of the ALFRED user stories under the four ALFRED pillars, namely:

- User-Driven Interaction Assistant that can interact with the user providing support to the daily activities.
- Personalized Social Inclusion element that prevents the users from the social isolation.
- Effective & Personalized Care element that allows monitoring the users' health status.
- Physical & Cognitive Impairments Prevention element that, by incorporating serious gaming, improves the physical and cognitive condition of the user.

The entire target group data found in this deliverable stems from the ALFRED focus groups, scientific literature, reports, studies and publications of related European funded research projects.

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1 Introduction

ALFRED – Personal Interactive Assistant for Independent Living and Active Ageing – is a project funded by the Seventh Framework Programme of the European Commission under Grant Agreement No. 611218. It will allow older people to live longer at their own homes with the possibility to act independently and to actively participate in society by providing the technological foundation for an ecosystem consisting of four pillars:

- **User-Driven Interaction Assistant** to allow older people to "talk" to ALFRED and to ask questions or give commands in order to solve day-to-day problems.
- **Personalized Social Inclusion** by suggesting social events to older people, considering their interests and social environment.
- A more **Effective & Personalized Care** by allowing medical staff or carers to access the vital signs of older people which are monitored by (wearable) sensors.
- **Physical & Cognitive Impairments Prevention** by incorporating serious gaming to improve the physical and cognitive condition by offering games and quests to older people.

1.1 ALFRED Project Overview

One of the major problems today is the increasing isolation of older people, who do not actively participate in society either because of missing social interactions or because of age-related impairments (physical or cognitive). ALFRED will allow overcoming this problem with an interactive virtual butler for older people, which is fully voice controlled.

The ALFRED project is wrapped around the following very clear main objectives:

- Empowering people with age related dependencies to live independently for longer by delivering a virtual butler with seamless support for tasks in and outside the home. The virtual butler ALFRED will have a very high end-user acceptance by using a fully voice controlled and non-technical environment.
- Prevailing age-related physical and cognitive impairments with the help of personalized, serious games.
- Fostering active participation in society for the ageing population by suggesting and managing events and social contacts.
- Improved care process through direct access to vital signs for carers and other medical stuff as well as alerting in case of emergencies. The data is collected by unobtrusive wearable sensors monitoring the vital signs of older people.

To achieve its goals, the project ALFRED conducts original research and applies technologies from the fields of Ubiquitous Computing, Big Data, Serious Gaming, the Semantic Web, Cyber Physical Systems, the Internet of Things, the Internet of Services, and Human-Computer Interaction. For more information, please refer to the project website at http://www.alfred.eu.

1.2 Deliverable Purpose, Scope and Context

The intention behind this deliverable is to ensure that the user requirements related to the ALFRED technology are analysed at an early stage and can thus be considered during the design and implementation phase. This deliverable will serve as a guideline for the

ALFRED architecture definition (as described in deliverable D2.4). The use cases and the user stories defined in this report are essential for the project, as they serve as a guide for the project partners in order to develop a user-friendly and useful solution for the target groups.

1.3 Document Status and Target Audience

This document is listed in the Description of Work (DoW) as “public”, as it provides general information about the goals and scope of ALFRED and can therefore be used by external parties in order to get according insight into the project activities.

While the document primarily aims at the project’s contributing partners, this public deliverable can also be useful for the wider scientific and industrial community. This includes other publicly funded projects, which may be interested in collaboration activities.

1.4 Abbreviations and Glossary

A definition of common terms and roles related to the realization of ALFRED as well as a list of abbreviations is available from the supplementary document “Supplement: Abbreviations and Glossary”, which is provided in addition to this deliverable.

Further information can also be found at http://www.alfred.eu.

1.5 Document Structure

This deliverable is broken down into the following sections:

- Chapter 1 provides an introduction and outlines the purpose, scope, context, status, and target audience of this deliverable.
- Chapter 2 defines the methods that are used for the definition of the user stories, which is the main result of this deliverable. Firstly, this chapter describes the ALFRED pillars and the target groups, which are the basis for the organized focus group sessions. Secondly, the chapter gives an insight into the focus groups sessions organized in France, Germany, and The Netherlands, and then defines the methods used for the end-user data analysis.
- Chapter 3 gives an overview of the existing user requirements that have been defined in literature, studies, and projects that are related to designing ICT tools for healthy and active ageing. This overview enables us to put the user stories in a wider social context, which ensures that the project partners take into consideration the essential and pertinent user requirements.
- Chapter 4 provides the ALFRED use cases and personas that have been verified with the end-user data driven from the different focus groups. These use cases and personas will be the basis for defining the functional and the non-functional requirements.
- Chapter 5 defines the user stories (i.e., the functional and non-functional requirements) that will be an essential foundation to the definition of the ALFRED system architecture and that will allow for the specification of concrete tasks for the system development.
- Finally, chapter 6 concludes the findings of the deliverable.

2 Methodology

The ALFRED project is applying a user centred design process to define the functionalities of the virtual butler. As part of this process, end-users are involved throughout the different phases of the project, starting with the definition of the user requirements, thus making sure that the results of the project align with the actual needs of older people and care systems in society. This chapter further explains the methods and procedures that were used to define the requirements, starting with the overall methodology, the focus group sessions and the baseline for the definition of the user requirements.

2.1 User Requirements Methodology

This section establishes the methodology for the collection of the user requirements in the ALFRED project. User requirements collection and analysis aim at providing insights about user needs related to the objectives of the ALFRED project.

The user requirements methodology that is used in the ALFRED project initially focuses on the definition of the target group, identifying who the actual end-users of the ALFRED system would be, and what their main characteristics are. These characteristics are further analysed with the help of existing research and literature, sketching a complete image of the end users in each of the pillars.

The target group is then visualized through personas. These personas reflect in a lifelike manner the characteristics of the target group of the ALFRED project. The use cases reflect the usage of the system by the personas. The personas and use cases that were defined in D2.1 ‘Strategy Consensus Document’ are used as a basis during this process.

These personas and use cases are then verified, extended and enhanced through a set of focus group sessions, thus directly involving members of the target group in the project. The advantage of a focus group session is that older persons can exchange their ideas freely, which enables ALFRED’s project partners to acquire a deeper understanding about its intended user groups, their needs and their ideas in regard to the ALFRED solution.

With the help of the focus groups, the personas and use cases are verified, enhancing and extending them to create a complete overview that describes the real-life sequences of events for a user using the ALFRED solution.

Finally, the use cases provide the basis for the definition of the user stories and the (functional and non-functional) requirements that form an essential input for the system architecture.

Figure 1 describes this process schematically.

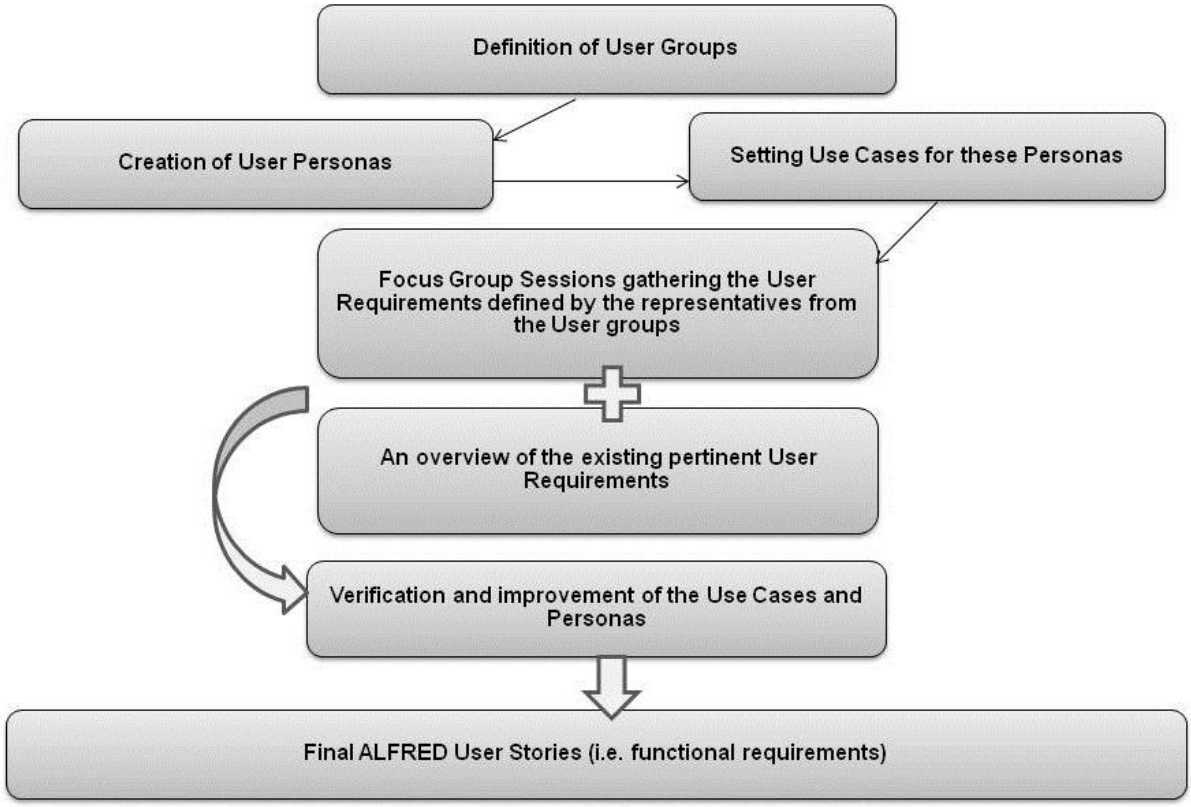

Figure 1: Illustration of the Different Work Steps within the T2.3

2.2 ALFRED User Groups

This section defines the user groups of ALFRED, that is, the people who will actually be using the results of the project. First, the three user profiles of ALFRED are described, where “the older adults” are the primary target group. The three user groups were enhanced through the focus group sessions, that and made more tangible with the personas in section 4.1. In this chapter, you will first have a general description of the primary and secondary user groups of the ALFRED solution, then (in the section 2.2.4) the more detailed segmentation of the different relevant target groups is given.

2.2.1 Older Adults

The primary end-user group of ALFRED consists of people aged 60 and above. This age threshold was chosen because the over 60-years-old persons are facing many changes in their lives that are related to 1) various physical and mental effects of ageing and 2) to the approaching retirement age. However, it has to be considered that ageing is a very complex process that affects different people in different ways. Persons from this target group very often display vast individual differences in physical and mental fitness as well as personal autonomy and therefore cannot be seen as a homogenous group. For individuals, old age is a relative concept. Many older people feel that they are treated in a patronizing manner, and therefore it is important not to use stereotypes and to not segment people based solely on their age.

Consequently, **attitude** and not age is the most fruitful approach to segmentation and targeting older adults. For this reason, ALFRED uses the "life stage model" as developed by the Center for Mature Consumer Studies (CMCS), which uses a person's biophysical, psychological and social circumstances in life to describe an older person's aging process [MOS96]. Hence ALFRED does not intend to put people in fixed boxes, but looks at stages of life and at the related needs in a specific stage to determine the requirements of the ALFRED target group.

People late in life can move from one stage to another. The changes between the stages may occur over time, or they may be abrupt. Furthermore, these changes are relatively age-indifferent, as they may begin at any time during one's life, or never be experienced at all. Despite the expected physical and mental decay that usually comes with increasing age, both improvement and worsening of physical and mental conditions are possible in equal magnitude.

For example, one can consider a person that has been suffering from a long-term but surgically curable joint disease (e.g., arthrosis of the hip). This condition can certainly affect the physical ability to walk long distances and also cause the person a considerable amount of pain. The obvious effects are that the person would feel frail and isolated. The restricted sphere of action would make it harder to meet friends and family and can lead to social exclusion. The pain which is connected to this condition would make the person feel frail and the restricted mobility would lead to further decay of muscle tissue and a general physical degeneration of wide parts of the body system.

However, as with many age related conditions there are various medical treatments available that can prevent or even reverse this "downward-spiral" towards physical, mental and social decay. After a hip endoprosthesis, the person will relatively quickly be able to vastly increase her activity radius, reduce pain and build up physical strength, which would reverse the above mentioned effects of frailty, social isolation and overall decay. Many conditions that threaten elderly people to reduce their ability to function individually and live healthy and productive lives today can either be slowed down dramatically by preventive measures or reversed by various means of medical interventions. It should be mentioned that this is a complex multifactorial process that may require collaboration across professions. It also requires the compliance of the older person to address these age-related issues.

The bilateral model of Moschis [MOS96] is a good way to illustrate this process. In the first "healthy and social" stage in this model, people enjoy the benefits of being older, such as being retired, having free time, having financial stability and mental stability. People are healthy and independent and do not see themselves as older people in any way. The "frail isolated stage" can be seen as the complete opposite, where people have one or several psychical and/or chronic ailments and are also in isolation due to different circumstances in life. People in this stage are likely to think of themselves as being old.

Between those two poles, two more stages exist. When people encounter more psychological and socially related problems (a partner that falls away, a lack of social skills, depression) as they get older, they run the risk of becoming "socially excluded". People are more socially withdrawn, although physically healthy and often secluded. When people encounter one or more physical problems, they enter the "physical impairments stage"**.** Although they have one or several chronic conditions, they have a high self-esteem and like to go out. They are worried about their physical independence

and wellbeing, but adjust well to their frailties and try to make the best out of life. Figure 2 illustrates the different stages of Moschis' model. Specific arrows indicate that people may move to another stage due to physiological, psychological and social changes.

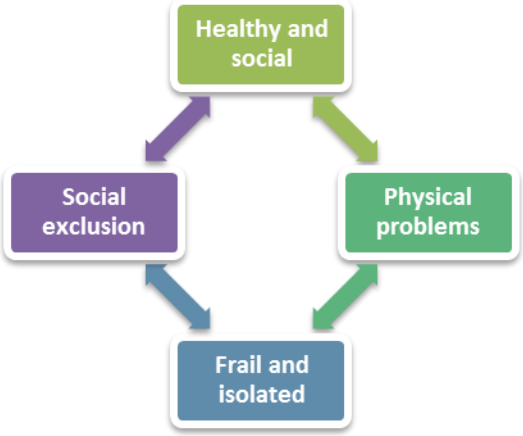

Figure 2: Life Stage Model by Moschis [MOS96]

Drawing on Moschis' model, ALFRED focuses on people that have needs related to social exclusion and physical problems**,** with the objective to prevent a shift to more isolation or frailty. ALFRED has the objective to prevent people from becoming frail and isolated by offering them support for social activities and physical and cognitive training and monitoring. ALFRED focuses on supporting people to become healthy and socially active and also has the goal to rehabilitate age related physical and cognitive impairments of older adults.

This definition of the target group here will not only focus the work of ALFRED, but will also be important in all dissemination and exploitation activities of the project towards older persons.

2.2.2 Caregivers and Medical Staff

Caregivers (both formal and informal) and medical staff form the secondary end user group of ALFRED. They will be interacting with ALFRED apps through specific interfaces and will directly benefit from the results of the project.

Informal caregivers are relatives, neighbours and friends who support a person in her activities of daily living. An informal caregiver does not receive any payment and is often a partner or child living in the same household. Informal caregivers will benefit from ALFRED solutions as they can stay up to date with real-time information about their loved one, which will hopefully grant them with a peace of mind. They will be able to use ALFRED to stay in touch and have direct contact with the older person in case of urgency. The remote interaction with the ALFRED user will allow carers a better coordination of care processes.

Formal caregivers can be social workers or carers, people that work for public or private organisations acting in the field of social wellbeing, home care, activity centres or charities. ALFRED will enable formal caregivers to take even better care of the older adults, reaching their clients better and offering more personalized support when needed.

Finally, doctors, nurses and other hospital staff will be able to provide more efficient care through direct communication with the patient.

2.2.3 Developers and App Creators

ICT companies will benefit from the ALFRED project results as the project will provide an open platform that enables third parties to produce applications for the ALFRED system. During the course of the project, several of those apps for certain domains will be created, e.g. for scheduling appointments or recommending social events. In order to enhance the system further, external developers will be able to realise their ideas in order to extend and improve the users experience with the ALFRED system.

2.2.4 Specifications and ALFRED Target Group Segmentation

A special attention is given to the users' attitude toward ICT-solutions. In the wide target group of older people there are just as many attitudes towards ICT as there are ice cream flavours. In order to focus the project towards a specific target group, the attitude of an ALFRED user[1] towards ICT is described. The average ALFRED user (65+) has little or no ICT skills. The target user might be a bit hesitant towards using ICT solutions but can be reasonably easy motivated by their family, children or caregivers to use ICT. Many of the ALFRED users are currently using a senior phone: A mobile phone with very big buttons which allows them to make phone calls and send messages. They only use this senior phone when they are going on a trip somewhere. Due to the fact that they see their children or people on the street around them with smartphones, they are becoming more interested in additional possibilities a smartphone or tablet has to offer. A normal smartphone would be too difficult to use, as they are already experiencing quite often problems with their senior phone. They feel insecure about using a smartphone. They are unfamiliar with terms such as 'apps', 'widgets', 'wifi', '3G', etc. Therefore ALFRED is the perfect solution. ALFRED can introduce them to the countless possibilities ICT has to offer. As soon as they discover the added value for them they will be very motivated to use it to enrich and support their daily lives.

Table 1 describes the three different target groups of future ALFRED users. The "Primary target group" (PGT) is composed of older adults with varying degrees of independence or need for care. As in real life, negative effects on health conditions are likely to make people preoccupied with themselves and their own problems related to their state of health. For this reason we stated different attitudes to ICT in the PTG1, PTG2, PTG3 and the PTG4. The "Secondary target group" (STG) is composed of lay informal caregivers and formal caregivers. Informal care givers are laypersons such as family members or friends; they can be seen as a cross-section of the overall general population with various degrees of ICT skills, but at least basic abilities. Formal caregivers are members of any sort of health profession, due the need of using ICT in modern healthcare; they will have at least moderate ICT. App developers, able to create new service offer in the ALFREDO marketplace make the "Tertiary target group" (TTG).

Finally the table 1 refers to personas that are a design tool for technological projects enabling a user-centric approach for the system development (you can find more information about the personas in the chapter 4.1 and in the Appendix 1). As an example,

[1] When not otherwise specified the term "end user" is used for the primary target group of user, which is the older person who uses the ALFRED system with the app running on a mobile device to assist him during his day.

Olivia the Older person represents TG1" Independently living and autonomous older adults 60+" if she is in a good health, but she can also be considered in the TG2 "Independently living older adults 60+ having informal caregiver's" after her sports accident when her spouse Carl the caregivers take care of her to get back in shape. With the same logic, Carl the Informal Caregiver can be represent the TG1" Independently living and autonomous older adults 60+" as he is an independent older adult, but when he is taking care of Olivia he is acting as a informal caregiver and as a result he can be also represent STG1: Informal caregivers.

Table 1: Target Groups of the ALFRED-solution

Target Groups	Target Group Category	Specific target group definition	Project tasks directly concerning this TG
Primary target groups (PTG)	PTG1: Independently living and autonomous older adults 60+	**General:** these persons pursue an independent lifestyle at home alone or with someone **Attitude to ICT:** some experience in certain ICT-tools or at least having an open attitude. Often they would like some support when using a new ICT-device for the first time. Once they have received the necessary support, the usage is autonomous. **Chronic conditions:** No chronic diseases but might suffer from age-related small physical problems, such as high blood pressure and cholesterol levels. **Value added of ALFRED for this TG:** helps these persons to stay independent and socially involved. Assisting them inside and outside home **Persona representing this TG:** Olivia the Older Person, Carl the Caregiver	T2.3, T8,1, T8.2, T8.3, T9.3, T9.6
	PTG2: Independently living older adults 60+ having informal caregiver's (friend, family member, spouse) support	**General:** these persons pursue an autonomous lifestyle at home alone or with someone but they have occasional support for their daily living, for instance to do their grocery shopping or preparing their meals **Attitude to ICT:** some experience in certain ICT-tools or at least having an open attitude. Often they would like some support when using a new ICT-device for the first time. Once they have received the necessary support, the usage is autonomous. **Chronic conditions:** No chronic diseases but might suffer from age-related small physical problems, such as high blood pressure and high cholesterol, reduced vision, reduced overall mobility, restrictions in range of motion, slightly reduced ability to perform activities of daily living and this reason they consult a doctor once in a while. **Value added of ALFRED for this TG:** helps these persons to stay independent and socially involved. Assisting them inside and outside home but also ALFRED enables them to be	T2.3, T8,1, T8.2, T8.3 T9.3, T9.6

		easily in touch with their informal caregivers and let them know how they are doing. **Persona representing this TG:** Olivia the Older Person	
	PTG3: Independently living older adults 60+ having formal caregiver's support	**General:** these persons pursue an autonomous lifestyle in a home environment but a formal caregiver give them regular support for their daily living, for instance monitoring their state of health or delivering meals. **Attitude to ICT:** some experience in certain ICT-tools or at least having an open attitude. Often they would like some support when using a new ICT-device for the first time. Once they have received the necessary support, the usage is autonomous. **Chronic conditions:** These persons might suffer from a chronic diseases such as diabetes, mild osteoarthritis, chronic Low Back Pain, diabetes and for this reason they benefit from a regular services of a formal caregiver **Value added of ALFRED for this TG:** encourage these persons to stay independent and socially involved. Assisting them inside and outside home but also ALFRED enables them to be easily in touch with their formal caregivers and let them know how they are doing. **Persona representing this TG:** Otto the Older Person	T2.3, T8.1, T8.2, T8.3, T9.3, T9.6
	PTG4 : Older adults 60+ with "Frailty-Syndrome"	**General:** these persons pursue an autonomous lifestyle in a home environment or in a hospital environment may have a formal or informal caregiver. because of chronic age-related reduced resilience. They also find it increasingly difficult to motivate themselves to participate in social events and to encounter interesting acitivities. **Attitude to ICT:** some negative effects of the chronic health condition may have an impact in their usage of the ICT-tools, but some experience in handling ICT-tools will most likely be present in most users appropriate familiarisation should enable them to use the system. **Chronic conditions:** These persons might suffer from chronic diseases such as coronary heart disease, diabetes, osteoarthritis, chronic obstructive pulmonary disease or current or past cancer and for this reason they benefit from having regular consultations in a hospital or with their doctor. **Value added of ALFRED for this TG:** ALFRED will allow these persons to be in contact with their entourage but also to monitor their physical wellbeing. ALFRED enables them to do physical exercise and to measure some essential vital data. ALFRED also can facilitate	T2.3, T8.2, T9.3, T9.6

		the contact with their entourage and health care providers **Persona representing this TG:** Hilde the Older Person	
Secondary target groups (STG)	STG1: Informal caregivers (such as friends, family members of the older adults)	**General:** these persons can be all ages and they take care of a close older adult who needs some support in the daily living and they do is as a voluntary activity. **Attitude to ICT:** These persons do not have a distinct age category as they are active and independent adults. They have at least basic skills with ICT-solutions, such as text editing on computer. **Value added of ALFRED for this TG:** ALFRED enables them to be easily in contact with the older adult that they take care of and to check that this person is doing well while they are not with them. ALFRED also helps in the time planning; they can use a shared calendar with the older person and set them important reminders. **Persona representing this TG:** Carl the caregiver	T2.3, T8.1, T8.2, T8.3, T9.3, T9.6
	STG 2: Formal caregivers (doctors, homecare nurses and other health care professionals of the older adults)	**General:** these persons are healthcare professionals and they work in different healthcare institutions. They take care of the physical and mental condition of the older persons. **Attitude to ICT:** these employees often use different ICT-tools and software in their work and have at least moderate ICT experience. These tools enable them notably to communicate and to check important data. **Value added of ALFRED for this TG:** ALFRED could help these persons to be more connected to the persons they are taking care of and enable them to check that the older adult is doing well. Furthermore, ALFRED will help them to offer more personalized support. **Persona representing this TG:** Mark from the Medical Staff	T2.3, T8.2, T9.3, T9.6
Tertiary target group (TGT)	TGT1: App developers	**General:** these persons are technology developers and they work in different private companies specialized in software development. These persons are looking for new markets and clients. **Attitude to ICT:** the developers are experts who develop new ICT-tools for clients. **Value added of ALFRED for this TG:** ALFRED will propose an open platform that enables third parties to produce applications for the ALFRED system. ALFRED helps them to reach new markets and clients. **Persona representing this TG:** Dave the developer.	T9.1, T9.3, T9.4, T9.5

In addition to the primary, secondary and tertiary target groups, the consortium has identified other relevant stakeholders that are described in the Table 2. These stakeholders, such as other research projects, industry actors or public structures, are identified in a this separate table as these not a part of the of "persona" methodology. These stakeholders will also be analysed in the other forthcoming project deliverables notably related to the Market and Applicability Watch Report (D2.2).

Table 2: Other relevant stakeholders of the ALFRED-solution

	Target Group Category	Specific target group definition	Related tasks
Other Stakeholders	**Researchers and academic communities** in the field of new technologies for active living and/or serious games	**General**: these academic stakeholders are active in the field of the assistive technologies for older persons and they are looking for new and innovative approaches. **Attitude to ICT:** these persons will have moderate of good knowledge about the ICT**Interest for ALFRED:** opportunity to promote actively and European widely the ALFRED innovations. **Value added of ALFRED for this TG:** ALFRED proposes an innovative and holistic approach of a mobile assisted living solution adapted for the older adults.	T9.3, T9.4, T9.7
	Other ongoing research projects in the field of new technologies for healthy and active ageing	**General:** These research projects are national or international and developing innovative technological solution for active ageing. **Interest for ALFRED:** an occasion to share know-how with relevant European stakeholders related to the ALFRED technologies and methodolodies **Value added of ALFRED for this TG:** ALFRED will propose these projects a new scientific point of view and propose common dissemination activities in order to acquire a larger audience.	T9.3, T9.4, T9.7
	Industry: different sectors of industry are interested and are already involved or will be involved in the implementation of mHealth. They will naturally be interested in the outcomes of the project. Also, they can be ALFRED customers.	ICT and Telcos companies: ALFRED users will need a mobile device and an internet connection. While many might already have access to this, others do not. Collaboration and synergies of ALFRED with these companies shall be fostered.	T2.2, T9.1, T9,4, T9.7
		Pharma companies: ALFRED should develop synergies that can be fostered with Pharmaceutical companies, in particular in the	T2.2, T9.1, T9,4, T9.7

		management of chronic diseases (controlling diet, increasing physical activity, setting up reminders for medication)	
		Insurance Companies: health insurance companies are an important player in the mHealth market, and might be customers of ALFRED	T2.2, T9.1, T9,4, T9.7
		Care homes: in some situations, older persons that maintain their independence to some extent are living in care homes. Care homes are likely first entry markets for ALFRED.	T2.2, T9.1
	Government bodies: With health and wellbeing in the political agenda of all EU Countries, government bodies are very much involved as healthcare providers, policy makers and often as payers too, The involvement and collaboration with these bodies will be key towards the end of the project and in the implementation phase. Among EU, countries vary largely in the way their healthcare processes are organized, some are at Regional level, other at National. On top of that, there are EU Directives that apply to all countries.	Regional	T2.2, T9.1, T9,4
		National	T2.2, T9.1, T9,4
		European	T2.2, T9.1. T9,4
	Community in General	European citizens are interested parties in all EU Projects. Not only the funding comes from taxpayers' money, but ultimately citizens are the ones that will benefit from the project results. Therefore, it is fundamental to communicate and explain to a general audience the objective and importance of the project and the impact of its results	T9.4

2.3 ALFRED Pillars – Basis for End-User Discussions

The ALFRED system is formed by four core concepts, the pillars. During the user requirement gathering and analysis phase, each of these pillars is presented to the ALFRED target groups who will provide relevant feedback for each of the core concepts. These user stories will be used as a basis for the definition of the architecture of the ALFRED system.

2.3.1 Pillar I: User Driven Interaction Assistant

In order to empower people with age related dependencies to live independently for longer the ALFRED project will deliverer a virtual butler with seamless support for tasks in and outside the home. This User-Driven Interaction Assistant is the first pillar of the ALFRED project and will be implemented as the ALFRED App, which allows users to ask questions and contact physical people by using their voice. In a sense, this functionality will provide a “Virtual Butler” to older people, helping them to get information, perform tasks and get in contact with other people.

2.3.2 Pillar II: Personalized Social Inclusion

In order to foster active participation in society for the ageing population the ALFRED platform will provide tools to suggest and manage events and social contacts. The services to provide such functionalities to the ALFRED platform constitute the second pillar of the ALFRED project.

2.3.3 Pillar III: Effective and Personalized Care

The aim of this pillar is to provide services to monitor the health status of a user. In order to achieve improved care process, vital signs will be accessible for carers and other medical staff. In addition, alerts can be sent in case of emergencies. The data is collected by unobtrusive wearable sensors monitoring the vital signs of older people. The services to provide such functionalities to the ALFRED platform from the third pillar of the ALFRED project.

2.3.4 Pillar IV: Physical and Cognitive Impairments Prevention

This fourth pillar of ALFRED focuses on mechanisms that motivate regular physical and/or cognitive activities in order to help reduce the effects of aging on the users, and it does this by way of so-called “serious games”. Serious games are games that strive to have a positive effect on their players besides mere entertainment. They use game mechanics to motivate the user to perform a task that she would otherwise consider dull or tedious, such as learning new skills or working out.

2.4 User Requirements Assessment Methodology

The end-user partners involved in task 2.3 organized several focus group sessions with representatives from the ALFRED user groups in order to define their needs and requirements related to the ALFRED technology. The collected end-user data was analysed, the ALFRED use cases were verified and enhanced and user stories were defined on the basis of this data analysis. This chapter details how the focus group sessions were organized and how the gathered end-user data was processed.

2.4.1 Focus Groups sessions

A total of six separate focus group sessions were carried out in conjunction with task 2.3. Each of the three end-user organizations (partners ESE, OUD, and CHA) carried out two focus group sessions related to “their” respective pillar of ALFRED. Each focus group had four to five participants (older persons above the age of 60 with different backgrounds) as well as one observer from the end user organization. The focus groups discussion were

organized by the end-user organizations of the project: by E-Seniors (ESE) in France, by the National Foundation for Elderly (OUD) in The Netherlands, and by Charité Department of Geriatrics (CHA) in Germany. The end-user organizations divided the ALFRED pillars according to their expertise in order to get a better focus on the end user involvement.

In addition to the older adults, professionals from different domains related to the relevant pillars were invited to take part in the focus group sessions (such as IT experts, logopedics, caregivers, business developers, and wellbeing organizations such as Red Cross). These are people who have an expert view and can see the wider scope of ALFRED.

2.4.2 ALFRED Focus Group Participants

In total, 30 participants that where older adults and formal or informal caregivers took part in the ALFRED focus groups. All of these participants were French, Dutch, German or Italian. They had very varied levels of education (going from Secondary school until PhD degree). Table 3 describes the focus groups in terms of number of participants, age and gender distribution and their usage habits of different ICT-tools.

Table 3: Summary of the ALFRED Focus Group Participants

	France (ESE)	**Netherlands (NFE)**	**Germany (CHA)**
Number of organized Focus Groups	2	2	2
ALFRED Pillars discussed in the sessions	Pillar I Pillar IV	Pillar I Pillar II	Pillar III Pillar IV
Total number of participants	10	10	10
Number of older adults involved	9	9	6
Number of formal and informal caregivers involved	1	1	4
Number of Female and Male participants	9 (F) and 1 (M)	7 (F) and 3 (M)	5(F) and 5 (M)
Average age of the participants	71 years	76,5 years	62,5 years
How often the participants use of ICT-tools (i.e. computer, laptop, smartphone or tablet)?	10 persons use daily	10 persons use daily	8 persons use daily, 1 person uses weekly, 1 person rarely
For which activities the participants use the ICT-tools?	Mail, news, communication, work, games, videos, geolocalisation, bank services	Mail, news, communication, work, bank services, information research	Mail, news, communication, work, games, music

2.4.3 Analysing the Data Derived from Focus Groups

The following process, which was inspired by an academic study [HD06], has been used for the qualitative content analysis:

The first step consists of audio taping and making field notes during the interviews with the main goal of recording the impressions of the interactions between the participants rather than focusing on plain word-by-word note-taking of the spoken content.

This is followed by step two, in which reflective journalizing immediately after the group discussion is performed. As long as the memory of the moderator is still fresh, the main ideas, concepts or issues raised by the participants should be documented.

The third step consists of listening to the audiotape and if necessary to do amendments to the previously written field notes. This step is necessary to ensure that the field notes are a precise refection of the interaction and may require listening to the audiotape several

times. The transcriptions from all the ALFRED focus groups can be found in the annexes (Appendix 2) of this deliverable.

The fourth step is a preliminary content analysis in order to define first common themes. The predefined “pillar-specific” core issues were used for the focus group data analysis, enabling an easy orientation in the definition of the user stories. These themes will be further refined and categorized in order to verify and improve the ALFRED use cases and personas as well as to produce the “user stories”.

As a last step, a thematic review of all the analysed interview data is performed in order to create the final user stories which are then grouped into different themes.

3 Overview of the Existing Requirements

In the field of active ageing many ICT projects have performed research on user requirements. This section will give a short overview of the main conclusions of these different user requirement analyses, giving important insights for the ALFRED development process.

3.1 Active Ageing and ICT

The use of ICT can assist active aging and, particularly, help social inclusion and efficient care as well as stimulate physical and cognitive capacities of the user. Furthermore, in today's digital society, more and more older persons take the advantage of using ICT tools in order to facilitate their everyday lives.

Besides radio and TV consumption, accessing the Internet is the most visible aspect of ICT within the community of the older adults. According to a study published in 2007 by the University of Jyväskylä in Finland [JKN07], older adults, aged between 55 and 90 years, use the Internet mainly for communication, online services and information search, similarly to the other age groups. The results also suggest that age, education and place of living are significant factors in determining whether an older person makes use of ICT. Figure 3 illustrates the Internet usage habits of older persons in the European countries.

However, usability and accessibility issues as well as age-related physical restrictions can set severe barriers to technology use among elderly persons, and these barriers can even lead to digital exclusion. The involvement of the target users in the development phase of the technology is a suitable approach in order to consider ways for overcoming these barriers, which are of three main types: physical, cognitive, and economic.

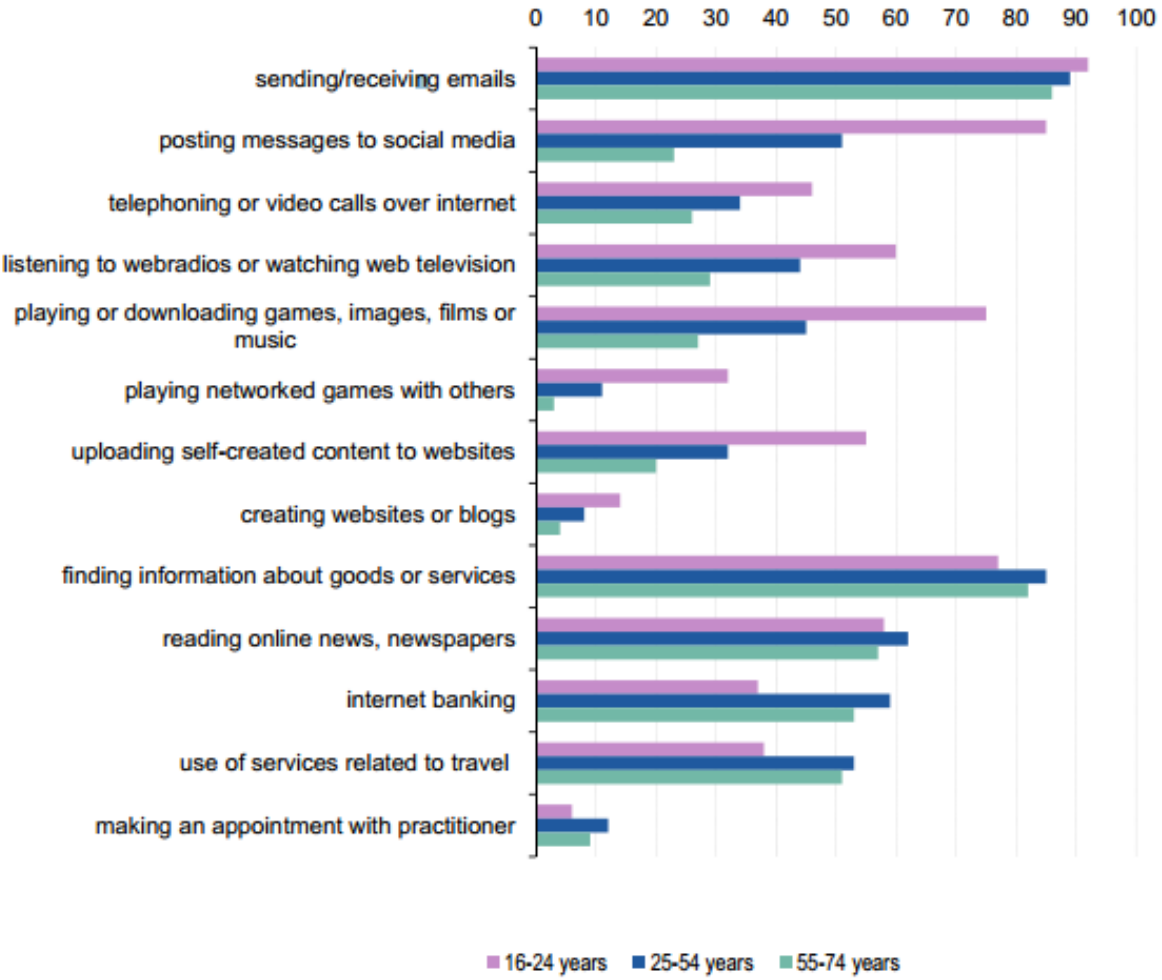

Figure 3: Internet Usage Habits (% of Internet users) (Eurostat, 2012[2])

3.1.1 Physical Barriers

Age-related physical impairments can be a real barrier for older persons when it comes to usage of digital devices such as smartphones or tablets. Visually related difficulties among aging adults include problems with scrolling texts (due to the scrolling speed), with seeing in dim light, with reading small fonts, and with locating objects. Hearing impairments among older adults are widespread but often moderate or mild, and are expressed as noise sensibility as well as impairments with certain frequencies, speech recognition and sound localisation [APA98]. Finally, older persons may have mobility and coordination impairments that can make them reluctant to do certain movements: a lack of balance, coordination and reflexes [NIH07] can discourage them to perform certain activities or use mobile products that often require accuracy and speed of dexterous movements. Despite a distinctive interest in being active, elderly are also concerned about finding the right balance between activity and rest throughout the day [A2E2].

[2] Eurostat: “Internet use in households and by individuals in 2012”: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-12-050/EN/KS-SF-12-050-EN.PDF

3.1.2 Cognitive Barriers

Physical limitations are interrelated with mental barriers that discourage older persons from trying out new things or learning new skills, which also influences their uptake of new technologies. It may take more time for older adults to encode, store, and retrieve information. The rate at which new information is learned can be slower among aging adults, which may lead to low self-esteem. Long-term memory shows substantial changes with age, while short-term memory shows less age-related decline. Attention and split attention capability is reduced and automated responses may be slow to learn and more difficult to suppress. On the other hand, users maintain well-learned skills and abilities, such as reasoning, well into old age [HAI93]. Furthermore, wisdom and creativity often maintain until the very end of life [APA98].

To this end, the developed technologies should provide solutions reducing the mental barriers related to the use of ICT tools. Notably, simplicity in the usage is an essential character of a solution that is targeted for older persons. Furthermore, technical support should be guaranteed in case of questions or problems with using the corresponding technologies, which will reinforce the reliability of the device.

3.1.3 Other Factors Influencing Technology Uptake

In addition to physical and cognitive barriers, economic constraints may also discourage older adults to use ICT devices. This situation is likely to vary between countries in Europe and generally, the cost of ICT tools and Internet access has fallen in recent years [BS08]. As a consequence, special attention should be paid to pricing policies and payment schemes of the developed solutions.

There is also a set of other factors influencing the technology uptake, that relate mainly to the personal situation of the older person. Data privacy issues should be considered at early phases of the solution development. Two key aspects are especially important: security, guaranteeing the protection of personal data, and control, assuring that the user can influence how her personal data may be used.

Perhaps most importantly, one should always bear in mind that the older end-users do not want to be considered as frail and at a disadvantage.

Table 4 summarizes the main factors influencing technology uptake by older people as pointed out in this section.

Table 4 – Factors Promoting Technology Use [NSG13]

Factors influencing technology uptake	Factors influencing the need for technology	Factors favouring technology uptake
Cost	User generation / cohort	Provide a clear additional value
Compliance with individual needs	Housekeeping style	Easier to use than expected
Previous personal experience with technology	Number and type (partner, children) of inhabitants in house	Pleasing user experience

Accessibility barriers (cognitive and physical)	Personal attitude towards technology	Adequate privacy of data

3.2 General End-User Requirements

Given some of the general and more specific impairments that are related to ageing, adaptability of the technology to the end-user capacities, both physical and cognitive, is fundamental to ensure adherence, comfort and beneficial use of the ALFRED solution.

The user interface will be the point of interaction of the older users to assist them in the monitoring of their daily health and in social activities. It should be engaging and user-friendly to ensure usability. The target population requires specific considerations regarding [RC04, HDKAE09]:

1. Visual elements
    - Design a layout that is simple and consistent
    - Ensure that colour and contrasts make it easy to distinguish and read icons and texts
    - Choose appropriate police and font sizes so that the text is readable
    - Consistent font sizes along the application
    - Select an adequate screen size
    - Adapt the speed of interaction
    - Allow for personalization of the visual interface
2. Auditory elements
    - Use an appropriate frequency to deliver messages
    - Allow for personalization of the voice
    - Speak the “language” of older people, plain language, no jargon or technical terms
    - Use the appropriate temporal and spectral characteristics for the speech recognition
3. General Usability Testing
    - Provide general simplicity in usage and learnability
    - Ensure that the “back” button behaves predictably
    - Make it obvious what is clickable and what is not
    - Have access to consistent and ongoing technical assistance and support
    - Be constituted of integrated accounts to avoid entering many passwords
    - Allow easy customization according to the preferences of the user
4. Confidentiality & privacy
    - Ensure confidentiality and protection of personal data (to counteract fear of losing control of personal data)
    - Let the user stay in control of personal data

3.2.1 Empowering People with Age Related Dependencies

Many older people want to live independently and to stay at their own homes. The objective of the ALFRED project is therefore to extend the independent living of older people and improve their quality of life while providing a level of safety that is equivalent to

the one they would have within residential homes. The user driven technology assistant will allow older people to talk to ALFRED, the virtual butler, and may be of great use to assist those with age related dependencies: providing a reminder for medication, scheduling an appointment with their doctor, helping the person to go home, etc. The performance of these tasks should be simple and safe for the users inside and outside home. The ICT-tools for older adults should [RC04, GSI10]:

- Ensure protection from personal injury, falls, safety while performing tasks
- Precise localization (error margin should be minimal to avoid confusion)
- Avoid redundant and repetitive tasks when not required
- Use conventional interaction elements
- Alert a caregiver if abnormal behaviour is detected

3.2.2 Fostering Active Participation in Society for the Ageing Population

In addition to allowing users to ask questions to ALFRED, the system will also actively contact its users and “talk” to them from time to time, e.g. to suggest social events. This will mainly be done in order to improve the active participation of older people in society. . The ICT-tools for older adults should [MB10]:

- Facilitate live interaction
- Facilitate the organization of face-to-face contacts (to counteract the fear that they will have less physical contacts because of using remote communication devices)
- Maintain contacts with younger family members and re-establish links with lost contacts
- Facilitate participation to community events
- Propose activities that are financially suitable
- Propose activities that fit the routine of older users (times for meals, day care, etc.)
- Propose learning activities that match the personal interests of the users
- Provide adequate and timely notifications of online and offline events
- Explain why some personal or sensitive information are required for some service (to preserve the sense of privacy)

3.2.3 Improved Care Process through Direct Access to Vital Signs

The ALFRED device will support carers and medical staff to achieve more effective and seamless care. For achieving this, the ALFRED solution will know about the contact points of the user and will allow carers and medical staff to interact with the ALFRED installation of the user and access information about the elderly user as perceived by (wearable) sensors. Monitoring of vital signs should [GSI10]:

- Require minimal and very simple interaction of the user with the remote monitoring (e.g. turn on-off)
- Have minimal impact on the patient
- Not interfere with her daily routine
- Be available at home and on the go
- Be integrated in clothes or devices which are actually wearable (comfort and design)
- Provide access to a carer or to information about your health at any time

3.2.4 Preventing Age-Related Physical and Cognitive Impairments

From time to time (or if explicitly requested by the user) ALFRED will offer to play games with the user. Those games are not intended to simply keep the person busy, but to help improve her physical and/or cognitive condition. Such games should [GA08, Mol14]:

- Allow others to join the game remotely in order to encourage social interactions
- Facilitate intergenerational interactions, such that for example grandfathers/mothers can play games with their grandchildren
- Encourage mild physical activities, like going for a walk
- Also work for people who do not like playing games in general
- Implement reward schemes to encourage regular gaming and improvement of performance
- Be personalizable to a certain degree to better adapt to the specific user

4 ALFED Personas and Use Cases

4.1 ALFRED Personas

Personas are a design tool for technological projects [COO99]. The aim of the persona method is to raise empathy for the end users in a development team as well as a deeper understanding of their drives and motivations. Personas allow developers to define the users they for which are developing and designing products. The personas are fictitious persons with their own characteristics including age, gender, state of health, attitudes etc.

In ALFRED, the personas that were defined in deliverable D2.1, have been further developed with the help of the CURE Elderly Personas database framework. The CURE Elderly Personas are synthetically generated from average traits mixed across countries[3]. They do not represent any private data from a single person and do not infringe any privacy and data security rights but use data from SHARE (project QLK6-CT-2001-00360). These personas have been enriched with information from the focus groups. Based on the focus groups results, an additional persona was created, reflecting a user with a larger support need.

The personas consist of six different user profiles that have been defined as stereotypical users of the ALFRED technology. These detailed description tables can be found in appendix 1.

4.2 Use Cases

Based on the focus group results and the adapted personas, the use cases that were described in the deliverable D2.1 “Concept, Role Definition and Strategy Consensus” have been revised, enhanced and enriched. The use cases now reflect more lifelike scenarios of use of ALFRED. The use cases are the basis for the user stories that will be further detailed in section 5. Each use case reflects a series of user stories that are mentioned below.

Table 5: Use Case – 1.1: Set Up with Care Organization

Use Case ID:	1.1
Use Case name:	Set up with Care Organization
Personas:	Otto the Older Person and Mike from the Medical Staff
The Home Care organization is implementing ALFRED as part of its new innovation programme, offering better and more efficient services to its clients. As part of the programme, Otto the Older Person receives a smartphone from the organization, which comes with ALFRED pre-installed. The costs of ALFRED and the smartphone are covered by his health insurance package. Mike from the Medical Staff brings Otto the smartphone and together they set up the user profile of Otto. Otto is somewhat insecure about security and wants to know exactly what ALFRED does with his personal data and if it shares information about himself only with his specific permission. After they have set up a plan on who can see which part of Otto’s data, Otto is happy to indicate his hobbies and interests and he lists his contacts, namely his friends and neighbours. Otto also wants	

[3] CURE-Elderly-Personas, Manual [Online] - 03 08 2012 - http://elderlypersonas.cure.at/.

to strengthen his social network and be able to share information on social events with other users, as he is feeling increasingly isolated. Together they set up a profile on ALFRED that allows Otto to connect with other ALFRED users so Otto can be notified about social, sporting and cultural events in his surroundings.

During the setup process, there are also some questions regarding his health status as well as his medication. Otto is physically healthy and does not need much medical attention. But he is worried about needing more support as he gets older. Therefore Otto agrees to set up a basic health profile together with Mike on ALFRED to share some information on his heart rate and emotional status that later can be expanded. Apart from the setup, the only technical task that Otto has to take care of is to frequently charge the battery of the smartphone that ALFRED is running on. All other interaction with the system is done simply by voice.

Table 6: Use Case – 1.2: Personalizing ALFRED

Use Case ID:	1.2
Use Case name:	Personalizing ALFRED
Personas:	Otto the Older Person
The first few days Otto the Older Person is getting acquainted with all the services ALFRED has to offer. For Otto it is easy to start to use ALFRED as the solution introduces himself to Otto and show the different functionalities that might be helpful for him. Otto is confident knowing that the device does not do any activities without his preliminary permission, as he has verified that this setting is on. This is important to him as he wants to keep the control over the device. Through the initial training, Otto gets acquainted with the agenda options, where he can add new appointments by simply speaking to the device. ALFRED reminds Otto of his agenda entries on a daily basis. ALFRED suggests that he could share his agenda with Mike from the Medical Staff, but Otto refused this as he considers this kind of information private. ALFRED is up to date on Mike's visits to Otto, so he gives him a short notice when Mike is coming so that Otto does not get impatient while waiting. Whenever ALFRED reminds Otto of an appointment, it suggests navigating him there. By inserting the information in the agenda, ALFRED also learns more about Otto and can relate his contact persons with the items in his agenda, as well as the locations to navigate him there. ALFRED reminds Otto every day to take his medicine. Sometimes Otto is confused and asks for a clarification. ALFRED then explains which medicine it refers to and what the box looks like. In case of any important health-related questions, Otto can easily consult Mike with ALFRED.	

Table 7: Use Case – 1.3: Personalized Social Inclusion

Use Case ID:	1.3
Use Case name:	Personalized Social Inclusion
Personas:	Otto the Older Person
ALFRED suggests different activities to Otto the Older Person on a daily basis. Often Otto does not feel like it, but sometimes his interest is caught. Last week, ALFRED mentioned that at the local activity centre they are organizing a pool championship. This is something Otto really likes so he decides to have a look. Otto enjoyed the event and met some people that were interested in setting up a small pool club,	

so he added their contact details and they arranged to meet the next week at the activity centre. Sometimes Otto prefers to chat with his friends from home, and he has discovered that with ALFRED, he can have video calls that amuse him as he can see the person with whom he is speaking.

Table 8: Use Case – 1.4: Effective and Personalized Care

Use Case ID:	1.4
Use Case name:	Effective and Personalized Care
Personas:	Otto the Older Person and Mike from the Medical Staff
For a couple of months now, Mike from the Medical Staff has been taking care of Otto the Older Person. Otto is an uncomplicated patient, who does not have any severe problems besides his blood pressure, which is a bit high. Mike regularly visits Otto to monitor his blood pressure. Twice a week, Mike calls Otto on the phone to ask him about his health status. However, there are times when Mike is not able to visit Otto as often as he needs to and consequently, he is sometimes concerned about Otto's wellbeing. Therefore he talked to Otto about his concerns and they both agreed it would be a good idea to have the ALFRED device to be included in the care process in order to improve Otto's healthcare and safety. The ALFRED solution seems a good option for enhancing the care process as its functions are expandable to the user's needs. Furthermore, for this purpose Mike hands a new shirt to Otto, which contains a set of unobtrusive sensors. These sensors can send Otto's vital parameters via ALFRED to Mike. This way, Mike is able to keep track of Otto's health. Mike and Otto agreed that this solution would benefit both of them. However, Otto is also concerned about his privacy and feels that it is very important that he can decide which of the sensor data is available to Mike. He also wants to be able to check the vital data himself. Otto also wants the new shirt to look nice and fashionable and does not want it to make him look like a patient. Otto and Mike have also agreed that not all of the functions of the shirt have to be enabled at all times. However, Mike has informed Otto the health data that these sensors record can provide information about why he is feeling pain or stress. Mike and Otto agreed that it would be good if ALFRED could remind Otto to take his pills on a regular basis and Otto confirms to ALFRED once he has taken his pills. Furthermore, ALFRED should be able to collect and/or keep track of Otto's heart rate, measure his body temperature, heart rate, breathing frequency, activity rate and the amount of taken steps. Mike is aware that Otto does not meet a lot of people, and so he wants to make sure that Otto is in a good shape and that he treats his health problems. Sometimes Mike call to Otto with the video call in order to check that he seems well.	

Table 9: Use Case – 1.5: Games for Cognitive Stimulation and for Staying Fit

Use Case ID:	1.5
Use Case name:	Games for Cognitive Stimulation and for Staying Fit
Personas:	Otto the Older Person and Mike from the Medical Staff
When Otto the Older Person feels bored, he asks ALFRED what to do and it might suggest a fun game. ALFRED offers a good selection of games that stimulate both the body and the mind. Otto knows that it is important to play these games on a regular basis, since Mike from the Medical Staff recommended doing so. Otto can also play together with a friend over the Internet, which Otto	

appreciates as it makes him feel less lonely.

The mind stimulating games enable Otto to keep his brain active. Otto can sometimes be a bit impatient and this is why he does not like to play one game for too long. Luckily, ALFRED also proposes mind stimulating games that are short so that Otto does not have the time to become frustrated while doing his memory exercises.

When Otto feels that he has not moved enough during the day, he plays games that make him perform mild physical activities. These games set specific goals for Otto, which motivate him to do all the proposed exercises. In the end, when he sees the results of the exercise (for instance, how many calories he has burned or which heart rate he had while playing), he is satisfied.

Mike is very satisfied with the ALFRED games that Otto plays weekly, as he can observe Otto's performance and easily check if his patient is feeling well. Mike is also able to coach Otto to perform better. Furthermore, Mike can directly ask Otto what is going wrong if he sees that Otto has not played for days or if he has very weak results. With Otto's agreement, Mike can ask ALFRED to send a regular summary of Otto's exercise sessions.

Table 10: Use Case – 2.1: Set Up by Older Person

Use Case ID:	2.1
Use Case name:	Set up by Older Person
Personas:	Carl the Informal Carer, Olivia the Older Person
Since Carl the Informal Carer was worried about his wife Olivia the Older Person, he has been looking for a solution that can both help Olivia to get better and also give Carl some more support in his care for her. He heard about ALFRED through a friend and he got interested as ALFRED is available on mobile devices, which makes it usable both indoors and outdoors. He bought two packages. Each package consists of a smartphone with the ALFRED app pre-installed, an Internet flat rate plan, and a simple step-by-step manual. Furthermore, Carl is satisfied as an after-sales service is provided in case he has trouble with the ALFRED device. Together, Carl and Olivia configure the ALFRED apps. Carl assigned the role of informal carer to himself. Additionally, they took a look at the easy-to-use ALFREDO marketplace for additional apps providing functionalities that are interesting for their specific situation. Based on their initial choices, ALFRED made more suggestions for other apps. Carl and Olivia are convinced that they are motivated to use ALFRED on a daily basis, as they can customize the ALFRED functionalities according to their preferences, which will enable them to use only the most useful and interesting services.	

Table 11: Use Case – 2.2: Physical Impairment Rehabilitation

Use Case ID:	2.2
Use Case name:	Physical Impairment Rehabilitation
Personas:	Olivia the Older Person and Carl the Informal Carer
Olivia the Older Person broke her leg few weeks back in a skiing accident and now she uses ALFRED to do her rehabilitation. ALFRED reminds her to start the exercises of the rehabilitation and tells her exactly what she has to do. When she asks for clarification, ALFRED shows her a video with an example. Olivia is motivated to use ALFRED for her rehabilitation as ALFRED sets different goals for each week, and after a few weeks of regular physical exercise with ALFRED,	

she can observe the results: her broken leg is getting back in shape. Sometimes Olivia plays a game over the Internet together with Carl the Informal Carer while Carl is away traveling for his job. This enables them to spend some time together, and also allows Carl to check that Olivia is doing well while he is away.

Table 12: Use Case – 2.3: Informal Care Coordination

Use Case ID:	2.3
Use Case name:	Informal Care Coordination
Personas:	Olivia the Older Person and Carl the Informal Carer
Every morning ALFRED asks Olivia the Older Person how she is feeling. If ALFRED learns that Olivia does not feel well, it informs Carl about this. This is very useful for Carl who cannot be with his wife all the time even though she has health issues. ALFRED also indicates to Olivia when she has to take her medicine and Olivia confirms this to ALFRED as soon as she has taken it. Carl can check this by asking ALFRED if Olivia took her medicine. This way, Carl does not have to annoy Olivia by asking her, and he feels more at ease. Thanks to ALFRED, when Carl is not at home, communication between Carl and Olivia is now easier: they can send little messages with ALFRED. Because Carl is busy with work and taking care of Olivia, he uses ALFRED to remind him about things that he should do at home. During her days, Olivia enjoys cooking and with ALFRED she can even discover healthier recipes, as eating well is an essential part of wellbeing. In urgent situations, Olivia can ask ALFRED for help. ALFRED then checks on which of her carers are close by and calls them to check up on Olivia. This is also a great relief for Carl, who has been feeling much less stressed lately.	

Table 13: Use Case – 2.4: Physical Impairment Care

Use Case ID:	2.4
Use Case name:	Physical Impairment Care
Personas:	Olivia the Older Person, Mike from the Medical Staff

After her skiing accident, Olivia the Older Person is released from hospital and has to start her rehabilitation process for her broken leg at home. Twice every week Mike from the Medical Staff comes to visit Olivia to check on the condition of her foot.

Olivia discovered that she can use ALFRED in her care process and it can help her to get back in shape as ALFRED offers different kinds of serious games that train her muscles, movements, balance and endurance.

Since Olivia has to perform physical exercises, she will need her hands free and have a big screen in order to execute ALFRED's physical exercises in a safe manner. Mike has pre-selected a set of specific exercises from the ALFRED device in order to support Olivia's care process. In order for Olivia to stay motivated, the games have to have something in common with her favourite sports, such as a "skiing-theme" or "winter-theme".

Furthermore, in order to avoid boredom and keep motivation high, ALFRED suggests different games, for example one day balance games, another day games for strength and the next day games to improve mobility.

ALFRED will also remind Olivia to maintain a good body posture and will frequently give her tips on how to lead a healthy life. Since Olivia now spends a lot of time at home, ALFRED can provide her with some fun and creative games that she can play from her chair. She can also play together with a friend over the Internet, and together they can pass long moments playing. At any time, Olivia can also observe her game results and compare them to those of her friends.

Table 14: Use Case – 3.1: Adapted Interaction and Support for Daily Activities at Home

Use Case ID:	3.1
Use Case name:	Adapted Interaction and Support for Daily Activities at Home
Personas:	Hilde the Older Person

Hilde the Older Person received the completely installed ALFRED device from her daughter. She is not very used to new technology and she often needs help when using ALFRED. Luckily, ALFRED can provide her with instructions for usage and if she still requires assistance, ALFRED can automatically call her daughter.

Hilde has customized the signal tones in ALFRED so that she can easily hear those. Particularly, the ALFRED vocal interaction voice speaks clearly and slowly enough, which enables Hilde to understand what ALFRED says. Furthermore, as Hilde has trouble seeing small written texts, she has adapted the font size of her ALFRED apps when she needs to read texts, which happens quite rarely. She likes that all the buttons in ALFRED are big enough to see and that she can manipulate them easily.

She really likes the vocal interaction mode with ALFRED that she activates with a specific button, as this mode enables her to speak with ALFRED instead of reading and writing text that would take much more time. With the vocal interaction mode, Hilde can use the different ALFRED functionalities with her speech. For instance, ALFRED can ask her questions, such as would she like to go out and do something, if yes, ALFRED could propose outdoor activities in the neighbourhoods. These spontaneous questions with ALFRED amuse Hilde and give her new activity ideas. She turns off this ALFRED question mode, when she wishes to stay tranquil.

Table 15: Use Case – 3.2: Support Activities on the Road

Use Case ID:	3.2
Use Case name:	Support Activities on the Road
Personas:	Hilde the Older Person
When Hilde the Older Person goes outside she carries ALFRED with her. Because it is so small and easy to take with her, she never leaves it at home. ALFRED keeps her up to date on her voluntary work, which motivates her to participate more. She is also less afraid to go outside as ALFRED can detect any dangerous situation, such as a fall and notify her daughter. Also when she gets lost she can easily navigate by using ALFRED, hopping on the bus if she gets too tired to walk. This really increased her confidence to go out and move about. Hilde has given ALFRED permission to propose different activities in her town, and she is particularly interested in exhibitions and museums. At the same time, ALFRED gives her daughter more peace of mind as she receives a notification when Hilde strays away too far from home. She can then easily call Hilde, or she can locate her by checking her location with the help of ALFRED. Hilde is also reassured as she knows that ALFRED can call her a taxi if ever she gets lost and too tired to walk back home.	

Table 16: Use Case – 3.3: Cognitive Impairment Rehabilitation

Use Case ID:	3.3
Use Case name:	Cognitive Impairment Rehabilitation
Personas:	Hilde the Older Person, Mike from the Medical staff
Hilde the Older Person now spends a lot of time at home and due to her health and mobility restrictions, she has a lot less exposure to the outside world than she used to have some years ago. Apart from her physical limitations, Hilde's daughter also realized that in the last couple of months, Hilde has been becoming more and more forgetful. She sometimes cannot remember names of friends anymore and has trouble in dealing with numbers. This conditions increasingly worried Hilde's daughter. Together with Mike from the Medical Staff who already checks on Hilde's cholesterol, they went to a medical centre to check on Hilde's cognitive abilities. The tests confirmed that Hilde suffers from a mild cognitive impairment. A condition that does not require pharmacological treatment, but that can be potentially improved by having increased cognitive input. Mike uses the ALFRED device already with other persons who have trouble remembering things. Together, Hilde and Mike agreed to use ALFRED for playing some easy serious games to increase her cognitive workload and improve her mental capacity. For Hilde it is important that she can use her imagination and be creative in the ALFRED games. She also would like to see some of her personal interests and hobbies such as music and arts to be represented in the games. Hilde liked to be outdoors a lot when she was still healthy but now that she is more restricted to the house, she is keen to play games that take her outside. Mike also suggested that some small physical games between the cognitive sections will be good to improve her memory, especially movement that involves a cognitive component such as opposite arm and leg coordination. Both Mike and Hilde also like that the ALFRED games have scores that show if Hilde is improving when she plays the games. In the future, Hilde also wants to play together with a friend over the Internet, and together they can pass long moments playing.	

Table 17: Use Case – 4.1: ALFREDO Marketplace

Use Case ID:	4.1
Use Case name:	ALFREDO marketplace
Personas:	Dave the Developer
Dave the Developer has convinced his manager to develop extensions for ALFRED, so he started developing an app that can read data from the health sensors a user is wearing. Dave starts his work by studying the API documentation and getting familiar with features ALFRED provides (e.g. components regarding speech recognition). He also has a look at the ALFREDO marketplace in order to check the terms and conditions regarding the sale of his applications. Dave steps through the API documentation and code samples in order to find out how he can define questions and actions the user can use to interact with ALFRED. He finds out that defining such questions is pretty simple and starts defining such parameters for his purpose. The ALFRED platform documentation also contains some rules an app developer has to follow in order to suit the ALFRED concept (concerning design and permissions the app will be granted). As soon as Dave has finished the development and testing of his app, he uploads it to the ALFRED marketplace in order to start the review process. As soon as the review process has been finished, Dave will be notified about the state of his app – whether it has passed the review or not. After Dave has created and uploaded his app and it has passed the review process, Olivia will be able to find it on the marketplace, install it onto her ALFRED device and check her health status whenever she wants to.	

5 Functional and Non-functional Requirements

This chapter gives the functional and the non-functional requirements that are the main results of task 2.3 “User Stories and Requirements Analysis”. These requirements are based on the user group data analysis that was carried out by the project partners.

All the ALFRED user stories have:

- Identification number (ID)
- Title
- Specific user group
- Related work task
- Related Use Case
- Prority number

5.1 Prioritization Process of the User Stories

The prioritization process of the user stories gathered during the user requirements phase was based on all the feedback acquired from the users and from the literature review and taking into consideration the context of the ALFRED project with the scope of the four different pillars. When the ALFRED user stories were prioritized, the describtion of work (DOW) of the project as well as the collected user data were considered. In addition, all the project partners contributed in this prioritization process. See Table 18 for the definition of the priority scale used for the user stories.

Table 18: User Story Priority Defintion

Priority	Definition
1	Very high priority. Will be implemented.
2	High priority. Important for the ALFRED system; an implementation is planned.
3	Normal priority. Good additions for the ALFRED system; will be implemented if resources are available.
4	Low priority. Extension points for the ALRED system; will only be integrated if possible through synergies to other user stories.
5	Out of the project scope. Will not be implemented.

In the prioritization process six different factors had an impact of the final priority of each user story. These factors were in the following order:

1. **Direct Input:** During the different focus group session the input from actual end user were collected. The input was summarized and structured and were on the one hand the basis for the user stories as well as a weighting factor for the importance of the user stories.
2. **Scope:** Based on the Description of Work as well as the Strategy Consensus Document (D2.1) user stories were weighted on how good they fitted in the scope of the project.

3. **Literature:** The literature review provided an academic point of view of the user stories. This is a notably important weighing factor to allow “behind the scene” factor to be considered.
4. **Interest:** Naturally in an R&D project, partners have different interest of the outcome and the results of a project. For this reason, the interest of – especially the technical – partners were taken as a minor weighting factor.
5. **Ethical:** The weighting based on ethical issues was only used to raise any user story priority. This was used to ensure a minimum focus on ethical related issues to prevent fatal dead ends were a practical usage of the project results would be impossible
6. **Regulatory:** As with the ethical weighting, the regulatory weighting was used only to raise any user story priority. This was done to prevent fatal dead ends were a practical usage of the project results would be impossible.

Based on these six different factors several discussions were held. During the discussions a mutual agreement on the priorities for each user story was found by the following approach:

- For “Direct Input” the end-user partner provided (for the developer-user this was done by the technical partners) a priority from 1 to 5 (see table x)
- For the “Scope” a weighting with a “+”, “-“ was given or a user story was marked as “out of scope”, which resulted in a priority of 5 with no further adaption for the user story
- For “Literature” an adjustment for the priority could be given by the end user partners by weighting the user story with a “+” or “-“
- For “Interest” an adjustment were done. Every partner could provide a “+” to an user story to increase the priority, but if no partner was interested in a user story a “-“ was given
- For “Ethical” or “Regulatory” an adjustment could be provided by an “+” to increase the priority of a user story

Note: During each discussion for the priority of the user stories it was highlighted that every partner should not just provide a wish list, but has to stay focused in order to create a priority list, were on the one hand a reflection of the six factors are considered, while not losing sight of the limited efforts due to the the scope of the project on the other hand.

5.2 General requirements

Table 19: User Story 001: Personal data

ID	US001	Title	Personal data	Priority	2
User Group	Older Person	Tasks	T3.1, T3.2, T3.4	Use Case	UC1.1
Summary	As an older person I would like to know exactly what ALFRED does with my personal data and share it only on my specific permission				

Table 20: User Story 002: Speech interaction

ID	US002	Title	Speech interaction	Priority	1
User Group	Older Person	Tasks	T3.2, T4.1, T4.2, T4.4	Use Case	UC1.2
Summary	As an older person I would like receive information from ALFRED by speech technology				

Table 21: User Story 003: Buttons

ID	US003	Title	Buttons	Priority	2
User Group	Older Person	Tasks	T3.2, T3.3, T4.1	Use Case	UC3.1
Summary	As an older person I would like use only well-visible buttons				

Table 22: User Story 004: Speech interaction

ID	US004	Title	Speech interaction	Priority	1
User Group	Older Person	Tasks	T3.2, T3.3, T4.1	Use Case	UC1.2
Summary	As an older person I would like use ALFRED as much as possible with speech interaction				

Table 23: User Story 005: Control

ID	US005	Title	Control	Priority	3
User Group	Older Person	Tasks	T5.1	Use Case	UC1.1
Summary	As an older person I would like always keep control on the activities of ALFRED.				

Table 24: User Story 006: Privacy

ID	US006	Title	Privacy	Priority	2
User Group	Older Person	Tasks	T3.4, T5.1	Use Case	UC1.1
Summary	As an older person I would like to be able to manage my privacy and data settings				

Table 25: User Story 007: Installation

ID	US007	Title	Installation	Priority	5
User Group	Older Person	Tasks	T4.2, T4.4	Use Case	UC1.1
Summary	As an older person I would like to have everything pre-installed, so that I do not have to set up ALFRED by myself				

Table 26: User Story 008: Wearable I

ID	US008	Title	Wearable I	Priority	2
User Group	Older Person	Tasks	T3.2, T4.2	Use Case	UC2.1
Summary	As an older person I would like ALFRED to be very small, wearable and easy to carry with me.				

Table 27: User Story 009: On Mobile Support

ID	US009	Title	On mobile support	Priority	4
User Group	Older Person	Tasks	T3.2, T4.3T6.4	Use Case	UC2.1
Summary	As an older person I would like to have ALFRED on all my computers, tablets and phone				

Table 28: User Story 010: Wearable II

ID	US010	Title	Wearable II	Priority	4
User Group	Older Person	Tasks	T4.2, T6.2	Use Case	UC3.2
Summary	As an older person I would like have ALFRED on a bracelet or a necklace so I can always wear him with me.				

Table 29: User Story 011: Clear Instructions and Troubleshotting

ID	US011	Title	Clear instructions and Troubleshooting	Priority	4
User Group	Older Person	Tasks	T4.3	Use Case	UC1.1
Summary	As an older person, I would like have clear instructions and service after sales that guide me if I have trouble in using ALFRED				

Table 30: User Story 012: Clear Speaking

ID	US012	Title	Clear speaking	Priority	3
User Group	Older Person	Tasks	T4.1, T4.3	Use Case	UC3.1
Summary	As an older person, I would like to have ALFRED speak very slowly and clearly				

Table 31: User Story 013: Reaction

ID	US013	Title	Reaction	Priority	4
User Group	Older Person	Tasks	T4.1, T4.3, T4.4	Use Case	UC1.2
Summary	As an older person I would like have ALFRED only reacting to me				

Table 32: User Story 014: Control

ID	US014	Title	Control	Priority	2
User Group	Older Person	Tasks	T4.1, T4.3	Use Case	UC1.2
Summary	As an older person I would like ALFRED only listen tome when I ask it to (e.g. by pushing a button)				

Table 33: User Story 015: Training

ID	US015	Title	Training	Priority	3
User Group	Older Person	Tasks	T4.1, T4.3, T4.4, T5.1, T6.1, T7.1	Use Case	UC1.2
Summary	As an older person I would like to have an introduction conversation with ALFRED so I can learn everything about him and he about me.				

Table 34: User Story 016: Buying

ID	US016	Title	Buying	Priority	4
User Group	Older Person	Tasks	T9.1	Use Case	UC2.1
Summary	As an older person I would like buy ALFRED in a senior shop with special client support				

Table 35: User Story 017: Cost of ALFRED

ID	US017	Title	Cost of ALFRED	Priority	4
User Group	Older Person	Tasks	T9.4	Use Case	UC1.1
Summary	As an older person I would like to ALFRED to be inexpensive				

Table 36: User Story 018: Visual Support

ID	US018	Title	Visual support	Priority	3
User Group	Older Person	Tasks	T4.3	Use Case	UC3.1
Summary	As an older person I would like to receive visual support, especially when looking at a list, map or agenda.				

Table 37: User Story 019: Payments

ID	US019	Title	Payments	Priority	4
User Group	Older Person	Tasks	T4.2, T4.3	Use Case	UC1.3
Summary	As an older person I would like to use ALFRED to pay for small amounts				

Table 38: User Story 020: Battery

ID	US020	Title	Battery	Priority	3
User Group	Older Person	Tasks	T4.2	Use Case	UC2.1
Summary	As an older person I would like have a very good battery for ALFRED so I can keep him on the whole day.				

Table 39: User Story 021: Low Battery

ID	US021	Title	Low Battery	Priority	2
User Group	Older Person	Tasks	T4.2	Use Case	UC2.1
Summary	As an older person, I woule like ALFRED to inform me about a low battery when leaving the house.				

Table 40: User Story 023: Adaptability for Vision

ID	US023	Title	Adaptability for vision	Priority	2
User Group	Older Person	Tasks	T3.4, T4.1, T4.3	Use Case	UC3.1
Summary	As an older person, I would like ALFRED be easily adapted for user that have visual troubles.				

Table 41: User Story 024: Adaptability for Audition

ID	US024	Title	Adaptability for audition	Priority	4
User Group	Older Person	Tasks	T3.4, T4.1, T4.3	Use Case	UC3.1
Summary	As an older person, I would like ALFRED be easily adapted for user that have hearing troubles.				

Table 42: User Story 025: Repeat

ID	US025	Title	Repeat	Priority	2
User Group	Older Person	Tasks	T3.4, T4.1, T4.3	Use Case	UC3.1
Summary	As an older person, I woule like ALFRED to repeat the last phrase.				

Table 43: User Story 026: Zoom

ID	US026	Title	Zoom	Priority	3
User Group	Older Person	Tasks	T3.4, T4.1, T4.3	Use Case	UC3.1
Summary	As an older person, I would like to be able to zoom into visual content				

Table 44: User Story 027: Changing Demand

ID	US027	Title	Changing demand	Priority	3
User Group	Older Person	Tasks	T3.4, T4.4	Use Case	UC2.1
Summary	As an older person, I would like ALFRED to respond to the changing demand of the users by offering new Apps in the ALFREDO platform				

Table 45: User Story 028: Communication with Entourage

ID	US028	Title	Communication with entourage	Priority	2
User Group	Older Person	Tasks	T4.1, T4.3, T5.4	Use Case	UC 1.1, 1.5, 2.3
Summary	As an older person, I would like ALFRED to help to communicate with my friends and family				

Table 46: User Story 029: Video Conversation I

ID	US029	Title	Video Conversation I	Priority	4
User Group	Older Person	Tasks	T4.3	Use Case	UC1.3
Summary	As an older person, I would like to have video conversation with others				

Table 47: User Story 030: Video Conversation II

ID	US030	Title	Video Conversation II	Priority	4
User Group	Medical caregiver	Tasks	T4.3, T6.2	Use Case	UC1.3
Summary	As a medical caregiver, I would like to have videophone				

Table 48: User Story 031: Human Interaction

ID	US031	Title	Human Interaction	Priority	2
User Group	Older Person	Tasks	T4.3, T5.2, T5.4	Use Case	UC1.3
Summary	As an older person, I would like ALFRED to encourage its users for real interaction between humans and not only with ICT-tools.				

Table 49: User Story 032: Information about Interesting Apps

ID	US032	Title	Information about interesting Apps	Priority	3
User Group	Older Person	Tasks	T4.1, T4.4, T7.2	Use Case	UC2.1
Summary	As an older person, I would like ALFRED to provide me with information about existing apps that corresponds to my interests.				

Table 50: User Story 033: Customizing Preferences

ID	US033	Title	Customizing Preferences	Priority	2
User Group	Older Person	Tasks	T3.4, T4.3, T5.1	Use Case	UC2.1
Summary	As an older person, I would like be able to customize my preferences in the different functionalities of the solution.				

Table 51: User Story 034: Expandable ALFRED unit

ID	US034	Title	Expandable ALFRED unit	Priority	3
User Group	Medical caregiver	Tasks	T6.1, T6.2, T6.4	Use Case	UC1.4
Summary	As a medical caregiver I would like to have a simple ALFRED unit that is expandable in is functions				

Table 52: User Story 035: Data Storage on Phone

ID	US035	Title	Data storage on Phone	Priority	3
User Group	Older Person	Tasks	T3.1, T4.2	Use Case	UC1.4
Summary	As an older person I would like to have my data stored directly on the phone				

5.3 Pillar I

Table 53: User Story 036: Wake Up Call

ID	US036	Title	Wake up call	Priority	1
User Group	Older Person	Tasks	T4.3, T6.3	Use Case	UC2.3
Summary	As an older person I would like to receive a wake up call from ALFRED in the morning checking on me if I am ok				

Table 54: User Story 037: Agenda

ID	US037	Title	Agenda	Priority	3
User Group	Older Person	Tasks	T3.4, T4.2, T4.3, T4.4	Use Case	UC1.2
Summary	As an older person I would like receive day and night rythm support with agenda reminders				

Table 55: User Story 038: Public Transport

ID	US038	Title	Public transport	Priority	1
User Group	Older Person	Tasks	T3.2, T4.2, T4.3	Use Case	UC3.2
Summary	As an older person I would like to receive support to use the public transport				

Table 56: User Story 039: Navigation

ID	US039	Title	Navigation	Priority	1
User Group	Older Person	Tasks	T3.2, T4.2, T4.3	Use Case	UC1.3
Summary	As an older person I would like to use ALFRED for navigation				

Table 57: User Story 040: Tourist Information

ID	US040	Title	Tourist information	Priority	3
User Group	Older Person	Tasks	T3.2, T3.3, T4.2, T4.3	Use Case	UC3.2
Summary	As an older person I would like to use ALFRED for touristic walks and indications with explanations on historical and cultural sights				

Table 58: User Story 041: Taxi

ID	US041	Title	Taxi	Priority	1
User Group	Older Person	Tasks	T4.1, T4.3	Use Case	UC1.3, 3.2
Summary	As an older person I would like to receive support to have a taxi on time				

Table 59: User Story 042: Home Domotics I

ID	US042	Title	Home domotics I	Priority	4
User Group	Older Person	Tasks	T4.1, T4.2, T4.3	Use Case	
Summary	As an older person I would like to use ALFRED to see who is standing at my door and open the door				

Table 60: User Story 043: Home Domotics II

ID	US043	Title	Home domotics II	Priority	4
User Group	Older Person	Tasks	T4.2, T4.3	Use Case	
Summary	As an older person I would like to use ALFRED to pick the phone sooner up when I am at home				

Table 61: User Story 044: Home Domotics III

ID	US044	Title	Home domotics III	Priority	4
User Group	Older Person	Tasks	T4.1, T4.2	Use Case	
Summary	As an older person I would like to use ALFRED to turn on/off the lights				

Table 62: User Story 045: Home Domotics IV

ID	US045	Title	Home domotics IV	Priority	4
User Group	Older Person	Tasks	T4.1, T4.2, T4.4	Use Case	
Summary	As an older person I would like to use ALFRED to control the heating				

Table 63: User Story 046: Home Domotics V

ID	US046	Title	Home domotics V	Priority	4
User Group	Older Person	Tasks	T4.1, T4.2, T4.4	Use Case	
Summary	As an older person I would like to use ALFRED to control the TV and radio				

Table 64: User Story 047: Media I

ID	US047	Title	Media I	Priority	4
User Group	Older Person	Tasks	T4.1, T4.2, T4.4	Use Case	UC3.1
Summary	As an older person I would like to use ALFRED to watch movies				

Table 65: User Story 048: Media II

ID	US048	Title	Media II	Priority	2
User Group	Older Person	Tasks	T4.1, T4.2, T4.4	Use Case	UC3.1
Summary	As an older person I would like to use ALFRED to hear about the news				

Table 66: User Story 049: Emergency I

ID	US049	Title	Emergency I	Priority	2
User Group	Older Person	Tasks	T4.2, T6.1, T6.2, T6.3	Use Case	UC3.2
Summary	As an older person I would like to use ALFRED to contact help in case of an emergency				

Table 67: User Story 050: Emergency II

ID	US050	Title	Emergency II	Priority	3
User Group	Medical caregiver	Tasks	T4.2, T4.3	Use Case	UC1.4
Summary	As a medical caregiver, I would like to use video calls in case of emergency				

Table 68: User Story 051: Emergency III

ID	US051	Title	Emergency III	Priority	3
User Group	Older Person	Tasks	T4.2, T6.1, T6.2, T6.3	Use Case	UC2.3
Summary	As an older person, I would like ALFRED to contact the nearest caregiver when I ask ALFRED for urgent help.				

Table 69: User Story 052: Home Care

ID	US052	Title	Home care	Priority	4
User Group	Older Person	Tasks	T4.3	Use Case	UC1.3
Summary	As an older person I would like to receive a message when my home care nurse is on her way				

Table 70: User Story 053: Medicine

ID	US053	Title	Medicine	Priority	1
User Group	Older Person	Tasks	T3.1, T4.3, T4.4, T6.1	Use Case	UC2.3
Summary	As an older person I would like to receive a medicine reminder from ALFRED				

Table 71: User Story 054: Pills Reminder and Validation

ID	US054	Title	Pills reminder and validation	Priority	3
User Group	Older Person	Tasks	T3.1, T4.3, T6.1	Use Case	UC2.3, 1.4
Summary	As an older person, I would like to be able to see whether I already have taken my pills in order to avoid overdose.				

Table 72: User Story 055: Pills Overview

ID	US055	Title	Pills overview	Priority	3
User Group	Medical caregiver	Tasks	T6.3, T6.4	Use Case	UC2.3
Summary	As a medical caregiver, I want to be able to see if the patient has taken her medicine.				

Table 73: User Story 056: Grocery Shopping

ID	US056	Title	Grocery Shopping	Priority	4
User Group	Older Person	Tasks	T4.1, T4.4	Use Case	UC2.3
Summary	As an older person I would like to use ALFRED to do my grocery shopping				

Table 74: User Story 057: Messages

ID	US057	Title	Messages	Priority	1
User Group	Older Person	Tasks	T3.3, T4.1, T4.3	Use Case	UC2.3
Summary	As an older person I would like to use ALFRED to send messages				

Table 75: User Story 058: Fall Detection

ID	US058	Title	Fall detection	Priority	2
User Group	Older Person	Tasks	T6.2, T6.3	Use Case	UC3.2
Summary	As an older person I would like to ALFRED detect falls and send an emergency to a specific contact.				

Table 76: User Story 059: Healthy Recipes

ID	US059	Title	Healthy Recipes	Priority	4
User Group	Older Person	Tasks	T4.3, T4.4, T6.1	Use Case	UC2.3
Summary	As an older person, I would like to have ALFRED to suggest healthy recipes.				

Table 77: User Story 060: Spontaneous Questions by ALFRED

ID	US060	Title	Spontaneous Questions by ALFRED	Priority	3
User Group	Older Person	Tasks	T3.3, T4.1, T4.3	Use Case	UC3.1
Summary	As an older person, I would like to ALFRED to ask spontaneous questions but it would be better to programme it during certain times of the day				

Table 78: User Story 061: Targeted Spontaneous Questions

ID	US061	Title	Targeted Spontaneous Questions	Priority	3
User Group	Older Person	Tasks	T3.3, T3.4, T4.1, T4.3, T4.4, T5.1	Use Case	UC3.1
Summary	As an older person, I woule like ALFRED to initiate questions, but it should be in the domains of my interest such as cinema, exhibitions, cooking...				

Table 79: User Story 062: Calls with ALFRED

ID	US062	Title	Calls with ALFRED	Priority	1
User Group	Older Person	Tasks	T3.3, T4.1, T4.3	Use Case	UC3.1
Summary	As an older person I would like to be able to call someone with ALFRED				

Table 80: User Story 063: Activation of vocal interaction with ALFRED

ID	US063	Title	Activation of vocal interaction with ALFRED	Priority	1
User Group	Older Person	Tasks	T4.3	Use Case	UC3.1
Summary	As an older person I would like to activate the vocal interaction mode of ALFRED by pushing a specific button				

5.4 Pillar II

Table 81: User Story 064: Contacts

ID	US064	Title	Contacts	Priority	2
User Group	Older Person	Tasks	T3.1, T4.3, T5.1	Use Case	UC1.2
Summary	As an older person I would like to use ALFRED to maintain my contact list in my phone				

Table 82: User Story 065: Agenda I

ID	US065	Title	Agenda I	Priority	2
User Group	Older Person	Tasks	T3.4, T4.1	Use Case	UC1.2
Summary	As an older person I would like to use ALFRED to manage my agenda				

Table 83: User Story 066: Agenda II

ID	US066	Title	Agenda II	Priority	2
User Group	Older Person	Tasks	T3.3, T3.4, T4.1	Use Case	UC1.2
Summary	As an older person I would like to insert my meetings into ALFRED using speech				

Table 84: User Story 067: Reminders I

ID	US067	Title	Reminders I	Priority	1
User Group	Older Person	Tasks	T4.3, T4.4	Use Case	UC1.2
Summary	As an older person I would like to receive reminders on my appointments				

Table 85: User Story 068: Reminders II

ID	US068	Title	Reminders II	Priority	3
User Group	Older Person	Tasks	T4.2, T4.3	Use Case	UC2.3
Summary	As an older person I would like to receive a reminder from ALFRED on all the things I need to bring with me when I leave the house				

Table 86: User Story 069: Shopping Reminders

ID	US069	Title	Shopping Reminders	Priority	3
User Group	Social caregiver	Tasks	T.4.3, T6.1, T6.4	Use Case	UC2.3
Summary	As a social caregiver I would like ALFRED to remind me of the things (items, shopping goods) I need to bring to the person I care for				

Table 87: User Story 070: Social groups

ID	US070	Title	Social groups	Priority	3
User Group	Older Person	Tasks	T5.1, T5.2, T5.4	Use Case	UC1.1
Summary	As an older person I would like to use ALFRED to set up social groups of people with similar diseases				

Table 88: User Story 071: Contact People

ID	US071	Title	Contact people	Priority	4
User Group	Older Person	Tasks	T4.3, T5.1	Use Case	UC1.1
Summary	As an older person I would like to use ALFRED to contact people from my own circle				

Table 89: User Story 072: Cultural Events

ID	US072	Title	Cultural events	Priority	2
User Group	Older Person	Tasks	T4.4, T5.2	Use Case	UC2.2
Summary	As an older person I would like to use ALFRED to learn about art expositions or a museum.				

Table 90: User Story 073: Social Activities

ID	US073	Title	Social activities	Priority	2
User Group	Older Person	Tasks	T5.2, T5.3, T5.4	Use Case	UC1.3
Summary	As an older person I would like to use ALFRED to learn about all the social activities that are organized in my neighborhood				

Table 91: User Story 074: Personalized Invitations

ID	US074	Title	Personalized invitations	Priority	2
User Group	Older Person	Tasks	T5.2, T5.4	Use Case	UC1.3
Summary	As an older person I would like to use ALFRED to get a personalized invitation to a social event, so it motivates more to go				

Table 92: User Story 075: Navigation I

ID	US075	Title	Navigation I	Priority	2
User Group	Older Person	Tasks	T3.2, T4.3, T5.2, T5.4	Use Case	UC3.2
Summary	As an older person I would like to use ALFRED to navigate to an event or concert and help me when I am lost.				

Table 93: User Story 076: Navigation II

ID	US076	Title	Navigation II	Priority	3
User Group	Older Person	Tasks	T3.2, T6.1	Use Case	UC3.2
Summary	As an older person I would like to use ALFRED to help me navigate despite my mild cognitive impairments				

Table 94: User Story 077: Purchase

ID	US077	Title	Purchase	Priority	4
User Group	Older Person	Tasks	T4.2, T4.3	Use Case	UC1.3
Summary	As an older person I would like to be able to pay for small amounts (for example for the restaurant at the community centre).				

Table 95: User Story 078: Organize Event

ID	US078	Title	Organize event	Priority	3
User Group	Older Person	Tasks	T5.1, T5.4	Use Case	UC1.3
Summary	As an older person I would like to use ALFRED to organize a meeting with a group of friends at a certain place				

Table 96: User Story 079: Online Games with Others

ID	US079	Title	Online Games with Others	Priority	3
User Group	Older Person	Tasks	T7.2, T7.3	Use Case	UC3.3
Summary	As an older person, I would like to play online games together with other users				

Table 97: User Story 080: Sports Classes in My Neighbourhood

ID	US080	Title	Sports Classes in my Neighbourhood	Priority	2
User Group	Older Person	Tasks	T5.1, T5.4	Use Case	UC1.3
Summary	As an older person I would like to get suggestions for sports classes in my neighbourhood				

Table 98: User Story 081: Human Contact

ID	US081	Title	Human Contact	Priority	2
User Group	Older Person	Tasks	T4.3, T5.4	Use Case	UC1.3
Summary	As an older person I would like ALFRED to enable me to have face to face contacts as well, not just virtual contacts over ALFRED				

5.5 Pillar III

Table 99: User Story 082: Control of Body Weight

ID	US082	Title	Control of Body Weight	Priority	3
User Group	Older Person	Tasks	T6.1	Use Case	UC1.4
Summary	As an older person, I would like to help me to control my body weight				

Table 100: User Story 083: Easy Contact with Caregivers

ID	US083	Title	Easy Contact with Caregivers	Priority	3
User Group	Older Person	Tasks	T4.3	Use Case	UC1.2
Summary	As an older person, I would like to just press one button to call my caregiver				

Table 101: User Story 084: Access to Vital Data I

ID	US084	Title	Access to Vital Data I	Priority	1
User Group	Older Person	Tasks	T3.1, T6.2	Use Case	UC1.4
Summary	As an older person I would like to would like to decide who has access to my vital data				

Table 102: User Story 085: Access to Vital Data II

ID	US085	Title	Access to Vital Data II	Priority	1
User Group	Older Person	Tasks	T3.1, T6.1	Use Case	UC 1.4
Summary	As a medical caregiver I would like to be sure that the user can decide who has access to her data				

Table 103: User Story 086: Wearable Sensors

ID	US086	Title	Wearable sensors	Priority	3
User Group	Older Person	Tasks	T6.2	Use Case	UC1.4
Summary	As an older person, I would like the wearables with integrated sensors to look good and not to be stigmatizing.				

Table 104: User Story 087: Vital Parameters on Phone

ID	US087	Title	Vital parameters on Phone	Priority	1
User Group	Older Person	Tasks	T6.2	Use Case	UC1.4
Summary	As an older person, I would like to see my vital parameters myself on the phone				

Table 105: User Story 088: T-Shirt I

ID	US088	Title	T-Shirt I	Priority	3
User Group	Older Person	Tasks	T6.2	Use Case	UC1.4
Summary	As an older person, I would like the ALFRED shirt to look good				

Table 106: User Story 089: T-Shirt II

ID	US089	Title	T-Shrit II	Priority	3
User Group	Older Person	Tasks	T6.2	Use Case	UC1.4
Summary	As an older person, I would like the ALFRED shirt has to be non stigmatizing				

Table 107: User Story 090: Measurement of Hypertension

ID	US090	Title	Measurement of Hypertension	Priority	3
User Group	Medical caregiver	Tasks	T6.2	Use Case	UC1.1, UC1.4
Summary	As a medical caregiver, I would like ALFRED to be able to determine the user's blood pressure.				

Table 108: User Story 091: Measurement of Body Temperature

ID	US091	Title	Measurement of Body Temperature	Priority	2
User Group	Medical caregiver	Tasks	T6.2	Use Case	UC1.1, UC1.4
Summary	As a medical caregiver, I would like ALFRED to be able to determine the user's body temperature				

Table 109: User Story 092: Measurement of Heart Rate

ID	US092	Title	Measurement of Heart Rate	Priority	2
User Group	Medical caregiver	Tasks	T6.2	Use Case	UC1.1, UC1.4
Summary	As a medical caregiver, I would like ALFRED to be able to determine the user's heart rate				

Table 110: User Story 093: Measurement of Breating Frequency

ID	US093	Title	Measurement of Breathing Frequency	Priority	2
User Group	Medical caregiver	Tasks	T6.2	Use Case	UC1.1, UC1.4
Summary	As a medical caregiver I would like ALFRED to be able to determine the user's breathing frequency				

Table 111: User Story 094: User Activity Level Monitoring I

ID	US094	Title	User Activity Level Monitoring I	Priority	2
User Group	Medical caregiver	Tasks	T6.2	Use Case	UC1.5
Summary	As a medical caregiver, I would like to have feedback on the activity level of the user				

Table 112: User Story 095: User Localization

ID	US095	Title	User Localization	Priority	3
User Group	Medical caregiver	Tasks	T6.4	Use Case	UC3.2
Summary	As a medical caregiver, I would like to locate the ALFRED user				

Table 113: User Story 096: Skin Conduction Sensors

ID	US096	Title	Skin Conduction Sensors	Priority	3
User Group	Social caregiver	Tasks	T6.2	Use Case	UC1.4
Summary	As a social caregiver, I would like ALFRED to be able to recognize pain and or stress by using skin conduction sensors				

Table 114: User Story 097: Step Counter

ID	US097	Title	Step Counter	Priority	2
User Group	Social caregiver	Tasks	T6.2	Use Case	UC1.4
Summary	As a social caregiver I would like to have a step counter included into ALFRED				

5.6 Pillar IV

Table 115: User Story 098: Motivation of New Activities

ID	US098	Title	Motivation of New Activities	Priority	1
User Group	Older Person	Tasks	T5.4, T7.2	Use Case	UC2.4, 3.3, 2.4
Summary	As an older person, I would like ALFRED to give me goals and missions that encourage me to do new activities and exercises and to go out.				

Table 116: User Story 099: Limited Serious Games Duration

ID	US099	Title	Limited Serious Games duration	Priority	3
User Group	Older Person	Tasks	T7.1, T7.2	Use Case	UC1.5
Summary	As an older person, I would like ALFRED to set limits in the games duration as I get bored easily.				

Table 117: User Story 100: Use of Imagination

ID	US100	Title	Use of Imagination	Priority	3
User Group	Older Person	Tasks	T7.1, T7.2	Use Case	UC1.5, 2.4
Summary	As an older person, I would like to play games where I can use my imagination				

Table 118: User Story 101: Use of Health Data in Serious Games

ID	US101	Title	Use of Health Data in Serious Games	Priority	2
User Group	Older Person	Tasks	T6.1, T6.2, T7.1, T7.2	Use Case	UC1.5, 2.2, 2.4
Summary	As an older person, I would like to do guided exercises with ALFRED. ALFRED should also use sensors to capture health data while I am doing exercises				

Table 119: User Story 102: Games for Interests

ID	US102	Title	Games for Interests	Priority	2
User Group	Older Person	Tasks	T3.4, T7.1, T7.2	Use Case	UC2.4
Summary	As an older person, I would like to have games that include my favourite sports (swimming, badminton, mountaineering, tennis, skiing, music….)				

Table 120: User Story 103: Suggestions for Sports

ID	US103	Title	Suggestions for Sports	Priority	2
User Group	Older Person	Tasks	T5.2, T5.4	Use Case	UC1.3
Summary	As an older person, I would like to receive suggestions about local sport classes				

Table 121: User Story 104: Good Posture

ID	US104	Title	Good Posture	Priority	1
User Group	Older Person	Tasks	T6.1, T6.2	Use Case	UC2.4
Summary	As an older person, I would like ALFRED to remind me to keep a good body posture				

Table 122: User Story 105: Regular Exercise Reminder

ID	US105	Title	Regular Exercise Reminder	Priority	2
User Group	Medical caregiver	Tasks	T7.2	Use Case	UC1.5, 2.4
Summary	As a medical caregiver I would like ALFRED to remind people to exercise regularly				

Table 123: User Story 106: Tips for Healthy Lifestyle

ID	US106	Title	Tips for healthy lifestyle	Priority	3
User Group	Older Person	Tasks	T4.3, T6.1	Use Case	UC 1,5, 2.3, 2.4
Summary	As an older person, I would like to receive specific tips how to reduce my health impairments without medication (for instance, go for more walks and eat healthier)				

Table 124: User Story 107: Evaluating Games

ID	US107	Title	Evaluating Games	Priority	2
User Group	Older Person	Tasks	T7.1, T7.2	Use Case	UC2.4
Summary	As an older person, I would like to have some games that show me how good my memory and physical health is.				

Table 125: User Story 108: Training for Muscles I

ID	US108	Title	Training for Muscles I	Priority	3
User Group	Older Person	Tasks	T7.1, T7.2	Use Case	UC 2.2, 2.4
Summary	As an older person, I would like to have training for specific muscle groups				

Table 126: User Story 109: Training for Muscles II

ID	US109	Title	Training for Muscles II	Priority	3
User Group	Medical caregiver	Tasks	T6.1	Use Case	UC2.2, 2.4
Summary	As a medical caregiver, I would like ALFRED to offer training for specific muscle groups				

Table 127: User Story 110: Results of Exercise

ID	US110	Title	Results of exercise	Priority	3
User Group	Older Person	Tasks	T6.1, T6.4	Use Case	UC 1.4, 1.5
Summary	As an older person, I would like to be able to see my training performance.				

Table 128: User Story 111: Changing Daily Exercise

ID	US111	Title	Changing Daily exercise	Priority	3
User Group	Older Person	Tasks	T4.4, T6.1, T7.1, T7.2	Use Case	UC1.5, 2.4
Summary	As an older person, I would like ALFRED to help to motivate me during the week to do exercise that should change daily, as the constant change motivates me				

Table 129: User Story 112: Varied Exercise I

ID	US112	Title	Varied exercise I	Priority	2
User Group	Medical caregiver	Tasks	T6.1, T7.1, T7.2	Use Case	UC 1.5, 2.4
Summary	As a medical caregiver, I would like ALFRED to propose me games that require the combination of mental and physical exercise, such as opposing motion exercises of the arms and legs				

Table 130: User Story 113: Varied Exercise II

ID	US113	Title	Varied exercise II	Priority	2
User Group	Older Person	Tasks	T6.1, T7.1, T7.2	Use Case	UC 1.5, 2.4
Summary	As an older person I would like to games that require the combination of mental and physical exercise, such as opposing motion exercises of the arms and legs				

Table 131: User Story 114: Correct Exercise

ID	US114	Title	Correct Exercise	Priority	5
User Group	Medical caregiver	Tasks		Use Case	UC1.5
Summary	As a medical caregiver, I would like to control if the user does the exercise correct				

Table 132: User Story 115: Summary of Exercise

ID	US115	Title	Summary of Exercise	Priority	2
User Group	Medical caregiver	Tasks	T6.4, T7.2	Use Case	UC1.5
Summary	As a medical caregiver, I would like to have a regular summary on how much exercise is performed by the user				

Table 133: User Story 116: Games for Care

ID	US116	Title	Games for Care	Priority	3
User Group	Informal caregiver	Tasks	T7.1, T7.2	Use Case	UC2.4
Summary	As an informal caregiver, I would like to have a game that the carer could play together with the user (i.e. with the patient), which would enable to monitor the users' state of health but also have some fun time				

Table 134: User Story 117: Mind Stimulating Games

ID	US117	Title	Mind Stimulating Games	Priority	2
User Group	Medical caregiver	Tasks	T7.1, T7.2	Use Case	UC1.5
Summary	As a medical caregiver, I would like ALFRED to propose training that promotes complex thinking.				

Table 135: User Story 118: Feedback for Right Exercise

ID	US118	Title	Feedback for right exercise	Priority	3
User Group	Medical caregiver	Tasks		Use Case	UC1.5
Summary	As a medical caregiver, I would like to give corrective feedback if exercises are performed wrong, too much or in any other way harmful to the user				

5.7 Core

Table 136: User Story 119: Clientele

ID	US119	Title	Clientele	Priority	3
User Group	Developer	Tasks	T9.4, T9.5	Use Case	UC4.1
Summary	As a developer, I want to present my app to as many people as possible.				

Table 137: User Story 120: Accounting

ID	US120	Title	Accounting	Priority	3
User Group	Developer	Tasks	T9.5	Use Case	UC4.1
Summary	As a developer, I want the accounting to be as simple and clear as possible.				

Table 138: User Story 121: Manage Apps

ID	US121	Title	Manage Apps	Priority	3
User Group	Developer	Tasks	T9.5	Use Case	UC4.1
Summary	As a developer, I want to easily create and to maintain my apps within the market place.				

Table 139: User Story 122: Feedback

ID	US122	Title	Feedback	Priority	3
User Group	Developer	Tasks	T9.5	Use Case	UC4.1
Summary	As a developer, I want to enable customers to provide feedback about my App and need an easy way to watch this feedback.				

Table 140: User Story 123: Pricing Modality

ID	US123	Title	Pricing Modality	Priority	4
User Group	Developer	Tasks	T9.5	Use Case	UC4.1
Summary	As a developer, I need an easy way to manage the pricing modality of my Apps.				

Table 141: User Story 124: API Documentation

ID	US124	Title	API Documentation	Priority	1
User Group	Developer	Tasks	T9.4, T9.6	Use Case	UC4.1
Summary	As a developer, I need the API to be well-defined and well-documented.				

Table 142: User Story 125: Development Support

ID	US125	Title	Development Support	Priority	1
User Group	Developer	Tasks	T9.4, T9.5	Use Case	UC4.1
Summary	As a developer, I need support in order to develop Apps (e.g. tools, examples, tutorials, etc.)				

Table 143: User Story 126: Fees

ID	US126	Title	Fees	Priority	4
User Group	Developer	Tasks	T9.5	Use Case	UC4.1
Summary	As a developer, I need to know the fees the provider of the market place charges for using the platform.				

Table 144: User Story 127: App Status

ID	US127	Title	App Status	Priority	3
User Group	Developer	Tasks	T9.5	Use Case	UC4.1
Summary	As a developer, I need to be notified as soon as possible when the state of any of my Apps changes (e.g. during review process).				

Table 145: User Story 128: Crash Details

ID	US128	Title	Crash Details	Priority	4
User Group	Developer	Tasks	T9.4	Use Case	UC4.1
Summary	As a developer, I need detailed information of what happened when my App crashes on the user's device.				

Table 146: User Story 129: Marketing

ID	US129	Title	Marketing	Priority	3
User Group	Developer	Tasks	T9.4, T9.5	Use Case	UC4.1
Summary	As a developer, I want to present my App in several ways (e.g. description, screenshots, videos, etc.).				

Table 147: User Story 130: App Design

ID	US130	Title	App Design	Priority	3
User Group	Developer	Tasks	T9.5, T9.6	Use Case	UC4.1
Summary	As a developer, I want to be able to design my App on my own – though there will be a few rules I have to stand to.				

Table 148: User Story 131: Usability

ID	US131	Title	Usability	Priority	1
User Group	Developer	Tasks	T4.1	Use Case	UC4.1
Summary	As a developer, I need an easy way to define questions (or actions) the user can ask and perform.				

Table 149: User Story 132: Device Functions

ID	US132	Title	Device Functions	Priority	2
User Group	Developer	Tasks	T3.1, T3.2	Use Case	UC4.1
Summary	As a developer, I need my App to be granted access to several operating system features (e.g. positioning, the microphone, web access, etc.).				

Table 150: User Story 133: High Level API

ID	US133	Title	High Level API	Priority	2
User Group	Developer	Tasks	T3.1, T3.2, T3.3, T3.4	Use Case	UC4.1
Summary	As a developer, I want the API components to be on a high level so that I don't have to deal with their details.				

Table 151: User Story 134: Sensor Access

ID	US134	Title	Sensor Access	Priority	2
User Group	Developer	Tasks	T3.1	Use Case	UC4.1
Summary	As a developer, I need an easy way to read data from health sensors the user is wearing.				

Table 152: User Story 135: Game Abilities

ID	US135	Title	Game Abilities	Priority	3
User Group	Developer	Tasks	T7.4	Use Case	UC4.1
Summary	As a developer for serious games, I need to be able to take control over some functions to provide the desired user experience (e.g. full screen drawing, responding to touch inputs, etc.).				

Table 153: User Story 136: User Settings

ID	US136	Title	User Settings	Priority	3
User Group	Developer	Tasks	T3.1, T3.4	Use Case	UC4.1
Summary	As a developer, I want to provide an easy way to manage the user settings.				

Table 154: User Story 137: API Assistance

ID	US137	Title	API Assistance	Priority	2
User Group	Developer	Tasks	T3.1, T3.2, T3.3, T3.4	Use Case	UC4.1
Summary	As a developer, I want the ALFRED API to reduce the work to achieve my goals.				

6 Conclusion

The ALFRED project applies a user-centred design process to define the functionalities and the key aspects of the ALFRED system. As a result, this deliverable “User Stories and Requirements Analysis” is an essential milestone of the project and the ALFRED technology development process that enables the project partners to come up with a solution that corresponds to the needs and the skills of the intended user groups.

In order to reach a deep understanding of the user requirements, the project partners have carried out:

- Six separate focus group sessions that relate to the four ALFRED pillars. The end-user organisations organized these sessions in France, The Netherlands and Germany.
- An overview of existing literature (reports, studies and European research projects) with the aim of defining the general user requirements of the ICT tools that are designed for older adults and that give support for their day-to-day lives.

The collected user requirements enabled us to verify and improve the ALFRED personas and use cases that were defined for deliverable D2.1 “Strategy Consensus Document”. These personas and use cases are design tools for technological projects, which help to develop user-centred products and services.

The functional and non-functional requirements (i.e., the ALFRED user stories) were defined based on the collected user group data analysis, which ensures that these requirements correspond to the real needs expressed by the user groups. The functional requirements define small parts of the ALFRED system.

The essential lesson of the user requirement report is that the ALFRED technology will not only provide the functionalities that the different user groups desire, but also take into consideration the barriers that these user groups may have in the uptake of an ICT tool. The determined functional requirements provide the basis for the user-centric design of the ALFRED system and will help to develop concrete solutions for mental, cognitive or other barriers. This way, the ALFRED system aims to acquire a high level of user acceptance.

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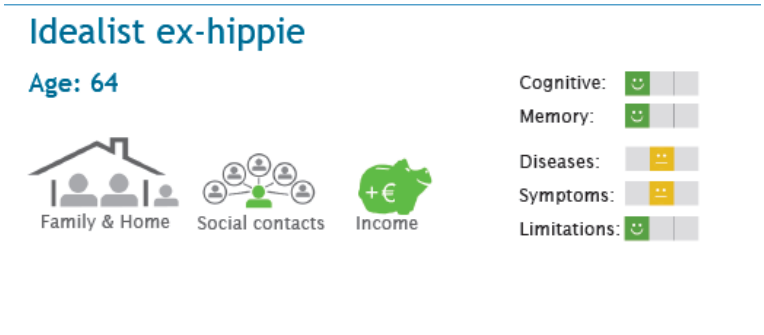
Appendix 1

1. ALFRED Persona Tables

As detailed in the chapter 2 of this deliverable, these ALFRED personas are inspired by the CURE Elderly Personas[4].

Olivia the Older Person



About & Family	Limitations/Difficulties in:	
Olivia is a very active and socially engaged person who loves life. She studied at the university and then worked as a social worker. Olivia and her husband Carl have two children who live in the same city. They often meet up or at least talk on the phone a couple of times a week. She has a good pension and has enough money to live without worries about the future.	None	
Health Olivia has rheumatism and pain in her back, knees and joints. She takes drugs for joint support and for keeping her blood pressure under control, but she does not have any limitations in her daily life because of her diseases. Her weight is normal and she eats healthy.	**Diseases** Arthritis/rheumatism High blood pressure	**Symptoms** Pain in joints
Social Almost every week, Olivia takes care of her grandson for a day. She loves playing with him. She is an activist and does a lot of voluntary work in various organizations. She likes cultural events and going out with her husband and friends. Her schedule is always full and she needs to keep a calendar for all of the events she attends. She goes swimming every week and takes long walks with her dogs. She goes skiing	**Psychographics** Happy, Positive, Active, Curious, Open minded, Satisfied	**Drugs** Yes **Hearing** Good **Eyesight** Glasses **Risks** None

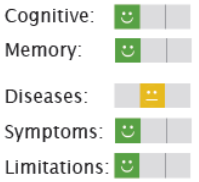
[4] The CURE-Elderly-Personas are fictitious persons synthetically generated from the average traits mixed across countries. Photos are taken from an external database. CURE-Elderly-Personas materials and document do not represent private data from a signle person. Information included in CURE-Elderly-Personas materials and documents do not infringe any privacy and data security settings. 2011 CURE-Elderly-Personas: http://elderlypersonas.cure.at

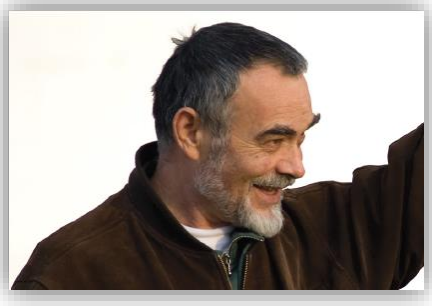
twice a year, which she still likes to do despite her arthritis and the fact that last time she broke her leg in a skiing accident.		
Technology usage She is very well-informed about current political issues and keeps herself up to date. She uses the computer and Internet for e-mails. This is how she keeps in touch with her friends who live abroad and receives information and newsletters internationally. She strongly dislikes TV and all kinds of mass media and looks for alternative sources of information on the Internet.	**General attitude toward technology** Positive **Devices in use** Computer with Internet	
Support need Unfortunately, Olivia had a skiing accident a few months back and now her mobility is reduced for months to come. This weighs on her as she normally is such an active person. The rehabilitation of her broken leg takes patience and time. During the rehabilitation period, she needs to use crutches. Due to her reduced mobility, she cannot go out on her own anymore and has to stay at home. She would like to feel more connected to society again and keep up with her social contacts, while getting better as fast as possible.		

Carl the Informal Caregiver

Devoted family man

Age: 63





About & Family

Carl still works as a product manager and earns well. He is a busy man, but enjoys his time with his wife and children. He is married and has two children, who attend university in the same city. His children live on their own, but they come for dinners on weekends and keep in touch daily, since they have a close relationship and often ask their parents for support.

Limitations/Difficulties in:

None

Health

Carl is generally in good health. He has no diseases other than high blood pressure. He uses drugs to keep it under control. Carl likes eating well and spends most of his time during the week in his office. He is a bit overweight and struggling to bring himself back into shape. He needs glasses to read, which he dislikes, as it reminds him of his age.

Diseases

Symptoms

None

Social

Carl likes being in charge and having control of ongoing situations. He likes living on a schedule and having a pre-arranged routine. Carl does not like surprises that spoil his plans. He is active in a social organization for the education of younger generations. He gives speeches about management and shares his experience and know-how with younger generations. Carl has a lot of friends and an active social life. He is also a religious person and goes to church together with his wife every Sunday.

Psychographics

Active,
Disciplined,
Hopeful,
Optimistic,
Religious,
Likes being in control

Drugs

Yes

Hearing

good

Eyesight

glasses

Risks

overweight

Technology usage

Carl knows his way around the web. He is interested in new technologies. He uses the Internet to keep in touch with distant friends and shares photos of nights out and of his dogs, but still prefers face-to-face contacts when possible. He is comfortable with gaining information from government websites through work-related browsing and is also accustomed to Internet banking applications. He received a smartphone as a gift on his birthday this year and is keen on using it.

General attitude toward technology

positive

Devices in use

TV
Computer with internet connections
Mobile phone

Support need

Carl is married to Olivia and since she broke her foot while skiing, he is scared that his wife is not well. Normally she is such an active and happy person, but she has taken a hard blow from the accident. Since the accident, Carl tries to come home early and to take care of his wife, keeping her company. But Carl is worried because he cannot be at home all day long and he knows that when Olivia is down, she can be reluctant to take her medicine or to do her rehabilitation exercise. He feels he is losing control and is looking for a way to organize the situation better.

Otto the Older Person

About & Family

Otto was a salesman and has enough savings for the rest of his life. He does not want to be alone but also does not want to leave his flat and live in a nursing home. He receives nursing care at home and meals on wheels service. Otto lost his wife recently. They had been together for almost 60 years. Since they did not have any children, he is now all alone and without a living family member left to look after him.

Limitations/Difficulties in:

Getting up from chair,
Lifting or carrying weights over five kilos,
Using maps in unknown places,
Preparing a hot meal,
Doing work around the house or garden

Health

Otto does not have any physical diseases, but suffers from psychosomatic symptoms such as heart issues, blackouts, dizziness, etc. He receives psychological treatment. He does not have much energy and feels physically weak. He uses glasses but cannot see well or hear well.

Diseases

none

Symptoms

heart issues, dizziness, blackouts, depression sleeping problems, breathlessness

Social

Otto considers himself old and this is preventing him from acting freely. He used to be a positive and social person, but now feels depressed and sad. However, he still visits the local seniors' club and meets friends there.

Psychographics

depressed,
sad,
introverted,
sentimental,
needs support

Drugs

Yes

Hearing

Below average

Eyesight

Below average, requires glasses

Risks

none

Technology usage

Otto likes listening to music on his old LP player. He is interested in technological devices, but does not see himself as competent enough to be able to learn to use new devices. He does not like watching TV but it is his main information source.

General attitude toward technology

neutral

Devices in use

TV
LP Player

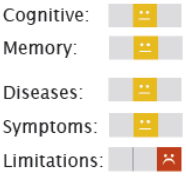
Support need

After Otto lost his wife recently he has been feeling quite lonely. He always looks forward to the visits of Mike and would like him to come more often to check on him, especially now that he feels so weak. He is often in the local seniors' club to play pool with his friends. However he feels that it is hard for him to find the motivation to leave the house. He is afraid that he will become very isolated now that he is alone.

Hilde the Older Person

Osteoporosis patient

Age: 75



About & Family

Hilde is a tough woman who nursed her husband for a long time until his death. Being an experienced housewife, Hilde lives with one of her daughters, taking care of the grandchildren and helping her daughter, who is a single parent. They have financial difficulties. Hilda has two more daughters. One of them lives in the same city.

Limitations/Difficulties in:

Walking 100m,
Getting up from chair,
Climbing stairs,
Carrying objects heavier than five kilos,
Difficulties in shopping for groceries,
Doing work in house and garden

Health

Hilde suffers from severe osteoporosis. Walking is not easy for her anymore, as she has pain in her knees and back. She stays at home since she is afraid of falling down and breaking her bones. She sits most of the time, and therefore she has swollen legs and is very overweight. Hilde has restless sleep and feels weak and low on energy. She uses reading glasses and cataract was recently detected on her. She uses drugs to prevent further development.

Diseases

Osteoporosis
High blood pressure & cholesterol
Mild cognitive impairment

Symptoms

pain in back, knees, swollen legs, sleeping problems, fear of falling down

Social

Hilde believes that her age prevents her from living independently. She misses her husband and sometimes feels lonely and becomes tearful, thinking about the good old times. Sometimes she questions the value of staying alive, but finds meaning in being with her family. She also works voluntarily for a social work organization that raises funds by knitting and collecting old clothes and accessories from the neighbourhood, which are picked up regularly from her flat.

Psychographics

sad,
tearful,
arduous,
hopeful,
committed to the family,
down-to-earth,
forgetful,
satisfied with her life

Drugs

Yes

Hearing

less than good

Eyesight

Cataracts, glasses

Risks

obese

Technology usage

Hilde is forgetful and cannot cope with numbers. She does not see herself as competent enough to learn to use new technologies or devices. At home she watches TV and listens to the radio. She sometimes sits in front of the computer together with her grandchildren, but she just watches what they do or show her. She does not have a mobile phone.

General attitude toward technology

neutral

Devices in use

TV
Radio

Support need

Hilde's daughter finds it difficult to motivate her mother to stay social and go out and about. Hilde feels that she needs support to take her medicines and keep up with her appointments as she is quite forgetful. She thinks she should do more exercise to lose some weight, which would also be helpful for the pain in her knees and would prevent her from falling, but she does not know where to start.

Mike from the Medical Staff

Support needed

Mike is a nurse of 43. He has had his job for twenty years and still likes it. He likes to take care of people. The last ten years, Mike has been working is a home-care nurse. He spends a lot of time in his car as he is lives and works in a rural area. For a couple of weeks now, Mike has been taking care of Otto. Otto is an uncomplicated patient who does not have any severe problems besides his heart rate, which is a bit high. Mike visits Otto on a regular basis to monitor his heart rate. Twice a week, Mike calls Otto on the phone to ask him about his health status. Mike is aware that Otto does not meet a lot of people and so he wants to make sure that Otto is in a good shape.

Technology usage

Mike has a smartphone in order to coordinate his work. He uses it for his personal affairs as well. At home, he has a laptop with an Internet connection which he uses almost every day.

Dave the Developer

Support needed

Dave works for a start-up company that develops applications for mobile devices. Dave heard about ALFRED through a friend who has already created apps for the ALFREDO open platform. Dave learnt that ALFREDO provides developers with simple and easy to use programming interfaces that allow them to access services related to health care as well as to integrate new apps to the ALFRED platform. Dave was happy to learn that ALFRED aims to facilitate the developers' work with useful documentation and tutorials.

As a result, Dave has suggested to his manager that their company should develop a new health app for ALFRED. This application could enable users to monitor their health state in real time. The manager approved Dave's idea as he learned that the ALFRED apps could generate some additional revenue for their small company.

Technology usage

Dave uses state-of-the-art technology at his work as well as at home.

Appendix 2

Transcriptions of the ALFRED Focus Group sessions in Netherlands, France and Germany

Notice for reader: please note that all the discussions were hold in the participants' native languages (Dutch, French and German) and translated then in English by the test administrators. These transcription documents are only work documents that enabled gathering the ALFRED requirements from the three counties.
Furthermore, in order preserve the anonymity of each involved end-users, the participants are named by code (U1, P1, A1 etc.) and only each test administrator (TA) is able to identify the participant. Of course, when analyzing the feedback the TA specified in the requirement specification work according to which user group had given the feedback (older adult end-user or a caregiver).

Netherlands Elderly Foundation (Netherlands): Focus Group Session 1
23/01/2014
Participants from User 1 (U1) until User 5 (U5). Focus of the discussions on the ALFRED Pillar I.
U3: First of all I think ALFRED should steer clear from anything related to Facebook. I want to know exactly what happens with my information. My information should only be shared with a closed group of friends or family on specific consent. Facebook is too difficult for older people, especially when it comes to controlling your data.
U3: For older persons that live at their own homes, it would be nice to receive a wake-up call from ALFRED, checking if you are alright in the morning.
U5: Yes, I like that idea, because if something is wrong it is easily detected and you don't have to lie dead for weeks in a bed.
U3: Also for people with minor cognitive impairments it would be nice to support the day and night rhythm with a simple wake up call, as well as agenda reminders. For people that live alone it would be nice to receive a call in the morning, to check on you and have a short talk.
U5: Last time I took the train and there were some problems on the rails, so I tried to look up the train information on the platform signs, but I couldn't make any sense out of it. It would be nice to use ALFRED to find my train or metro, or any other public transport and he would guide me to the right platforms at the right time.
U1: Also for the tram it is good to use a speech controlled ALFRED. Especially when the sun shines it is good to use speech technology. Also when you forget your glasses it would be nice to have speech control.
U1: It would be good to use ALFRED for navigation, but also for touristic navigation, so you can make a nice tour through a city with explanation on the cultural and historical sights.
U1: You don't want to touch many buttons, just one button, keeping everything as simple as possible with as much speech interaction as possible.
U5: In that case it would be nice if ALFRED could support all aspects of mobility, so you know each time exactly how and when to go to an appointment and which transport to take based on the weather, if it is going to rain or not.

U5: Lately it is very difficult to find a taxi. If you call you sometimes have to wait for a very long time and the taxis have to come from far. I would like ALFRED to support me in having a taxi on time.
U4: I would like to use ALFRED at home to open the door to visitors. For me it takes a long time to get to the door, as I use a wheelchair. It would be great if ALFRED could help me identify the person at the door and then open if I decide to do so.
U4: Also for picking up the phone it takes me long to get to the phone when I am in the kitchen. People have to let the phone ring a long time. It would be nice to use ALFRED for this.
U2: Then it would be nice if ALFRED could also turn on the lights at home and give more support for all these things at home. The heating and so on.
U3: You could even use ALFRED to control the TV or the radio so you never have to use a remote control with little buttons again. Then I could ask ALFRED: 'Please turn on the TV at channel 4'. Or even better if ALFRED would know which program is on which channel, or when my favorite programs are on the TV.
U5: It would be nice to use ALFRED also for games and movies and so on.
U2: You can use ALFRED also to tell you the news if you want to know what's going on and you don't want to read the paper.
U3: ALFRED could also help to detect an emergency or a fall at home and call directly to a family member or an emergency service.
U3: Then it is important that you raise interest ,especially for people that need support to keep living independent. It has to be very easy in use for people.
U5: The people that are younger, around 65, are already much more used to computers and technology then us, and they will be able to use these technologies even better.
U4: It would be nice if ALFRED could give me a message when my home care nurse comes by, so I know when they are coming. Sometimes I have to wait for a long time.
U3: You can also use ALFRED as a reminder to take your medicine then.
U1: ALFRED could also do my shopping. If I make a shopping list by telling ALFRED what I need and ALFRED would make sure that the groceries are delivered at my home by the supermarket. That would be really nice.
U2: It will be nice to send messages with ALFRED, so you don't have to do it with the little buttons on the mobile phone anymore.
U2: It will be important to always keep control on what you are doing. ALFRED could have his own initiative, but not after checking very clearly with the user.
U3: It would be nice to maintain contacts in ALFRED, but this should remain within family and friends circle. I don't want to receive messages of anyone that I don't know.
U3: Also it shouldn't be like facebook where privacy and data settings change without you being aware of what you are doing.
U5: We need options that prevents other people from making misuse of ALFRED and get to our personal information.
U5: Last time I totally forgot about an appointment I had, so I would like to use ALFRED to keep up with my appointments and notify me when I forget something.
U4: I would like ALFRED to remind me if I forget something from home, when I go out.
U1: Then I would also like to insert my appointments with speech.
U5: Then you always have to take ALFRED with you.
U3: ALFRED must be very wearable then. Maybe a nice necklace or something that you always wear and take with you.

U4: If you use ALFRED for emergencies it might be difficult. I don't have my mobile phone always with me. My friend had an alarm button and she left it always on her bedside table, so when she fell, she couldn't use it.
U3: ALFRED should be on a small phone to take it easily with you. I think that a smartphone is easier than a tablet because you can easily take it with you and use it also for calls.
U2: I find it very difficult to get used again to new technology, I don't like to study for a long time the new functions and I always forget how to use it. If it would be totally voice controlled, it would be very handy for me. If I buy such a thing it must be very easy, so it should be directly installed for me.
U5: ALFRED can give suggestions and reminders, but for a specific action he should not start himself. He cannot be listening to conversations I have with other people or call automatically my daughter, as she might also be on holidays.
U5: ALFRED can keep up my appointments and remind me of them.
U3: When ALFRED is detecting a fall, he should first check if the user responds and only then call.
U2: ALFRED should be delivered on a smartphone and you don't have to do anything to set it up or to begin using it.
U3: ALFRED should react only to the owner, because there is a lot of data in it.
U2: ALFRED should be adjusted to the personal settings, but it is too difficult to set it up your elf. How can ALFRED be set up, without any technological knowledge. Should there be a list with questions on all the possibilities that ALFRED has to offer.
U1: I would rather not use ALFRED for banking affairs. I wouldn't like to discuss these things out loud with a smart phone. (all agree)
U2: I don't see the added value of videocalling(all agree).

All participants agree that:

All agree: A phone conversation can only be started with specific command of the user. He can make the suggestion to call someone, but he cannot do it automatically without consent.
All agree: ALFRED should be very wearable, a watch or a necklace might be a nice option, with a specific design for men and women.
All agree: Visual support might be useful when you want to see an overview of your agenda or a shopping list, but it is preferable to not use any buttons.
All agree: Personalization is important , but it has to be clear on what you personalize and which data is used.
All agree: For older people it is easier if everything is voice controlled.

Summary (written with keywords on the blackboard)

ALFRED should help at home with:

- Turning on the lights, heating, tv, opening the door or answering the phone (domotics).
- Call and maintain the contact list
- Make appointments/medicines in an agenda and remind of them.
- Have an alarm clock with a (social) wake-up call.
- Do shopping

ALFRED should help on the road with:

- Public transport/taxi

- Navigation (including touristic routes with nice explanation)

ALFRED should help always with:

- Fall detection and emergency call
- Calling

The interaction with ALFRED should be:

- Totally voice controlled
- With some visual aid of you require it (agenda, lists, etc.)
- Be very robust.
- Very wearable
- Small

I would buy ALFRED if I can buy it with the phone, plus the internet plus the app in one package without having to do any work on the installations.

Netherlands Elderly Foundation (Netherlands): Focus Group Session 2

27/01/2014

Participants from user 6 (U6) until user 10 (U10). Focus of the discussions on the ALFRED Pillar II.

U10: In our center we have a group of people with mild/beginning dementia, that comes together to share their experiences on how they cope with this illness. ALFRED might be able to support this kind of interchange digitally and bring people together.

U9: Social contacts should be mainly with contacts from your own circle. Older people don't want to receive messages from people that they do not know.

U8: I do not want to publish where I go on a social network like facebook. These communications are so meaningless. I don't find that interesting at all.

U9: How do you make sure that only the owner of ALFRED can use it with his or her voice? Privacy is very important. Also when going outside, I do not like it when companies get a lot of my information. I read in the news that companies can track the wifi signal of smartphones to know exactly where I am shopping or what I am buying. Older people do not want these things to happen without their consent. I think it is important to have this kind of support, but I am a bit scared about companies exploiting the information that they get from the users of their services.

U9: I often play pool with a group of friends. It would be very handy to use ALFRED as an organiser for these event, like setting the date, inviting everybody, reserving the pool table, etc.

U6: It would be nice to use ALFRED for emergencies on the way, if you are lost and ALFRED can bring you home or if you fall and you need help.

U8: But then you always have to bring ALFRED with you. How would you do that?

U7: ALFRED would also have to be waterproof so you use it on the beach when you go swimming. And it has to be very wearable, maybe like a bracelet so you take it always with you.

U6: I would like to use ALFRED to set up a phone cirkel. These phone cirkels help older people to have a short conversation every day and check up on you when you live alone. I would also like ALFRED meet up with other people for a cup of coffee or something.

U7: I would use ALFRED to keep up all my appointments and remember me when I am supposed to meet someone. I would also keep my agenda up to date with ALFRED.

U7: I would use ALFRED to go a specific exposition of an artist I like in a museum.

U8: Here in the neighborhood we have a lot of activities that are organized every day, but sometimes you just don't know what there is available. It would be nice to receive a complete overview of everything that is going on, so you can make choices that maybe you wouldn't have thought of before as a specific interest.

U9: But it should be a personal message. As a volunteer I often invite lonely older people to activities, but they don't go unless I go their door and invite them personally. A lot of people can be very hesitant, especially when they are in isolation, it is difficult for them to break this barrier. It is important to visit them and give a personal touch to the invitation so they really feel motivated.

U6: I am not sure how you make sure that ALFRED can only be used by you. This worries me. Would you use a code to start using it, or say a password?

U10: You could also use your finger print to activate ALFRED, this is very easy to do and it is very safe and personal.

U8: I am more worried about setting up ALFRED. I don't like technology at all and I almost never use it. In order to set up ALFRED I would need a very extensive manual. I am not sure if I would be able to do this.
U10: Speech interaction is crucial to have a very easy interaction and to avoid problems with the device. My mother is always afraid when a little lamp starts blinking, if ALFRED can explain what it means it would solve everything.
U10: If ALFRED is complete voice controlled you might be able to set ALFRED up with your interests and preferences based on an initial interview where ALFRED can ask on a step by step basis on your interests, preferences and contacts, also related to privacy and data.
U8: It might also be possible to buy ALFRED in a senior shop where everything is set up by the shop's staff and they offer specific support for older people.
U7: I would also use ALFRED to navigate to a specific event or concert or so on or to an exposition. When I get lost I would like to know how to find my way with the help of ALFRED.
U10: ALFRED can help people that have cognitive impairments. Especially people with minor cognitive impairments can take advantage of such a solution that helps them to find their way home back.
U6: I have a tablet and I can already do these things with a satnav as well. I can't drive a car anymore because I have very bad eyesight, so for me it is very important to have speech interaction.
U10: What about people that have hear impairments? For these people you could first of all use a small earphone that eliminates noise from outside and makes ALFRED better understandable. For a completely deaf person you would need to have ALFRED totally visual, changing all aspects of voice interaction.
U7: Whenever I get nervous or don't know how to work with my tablet any more, I just go to the very beginning. It would be nice to have a similar function with ALFRED as well. If you don't get the information or response you need you must be able to go easily to the beginning.
U8: If you could pay with ALFRED, you could go to a museum and directly pay for the entrance. ALFRED would then have to function as a ticket as well so you don't have to print the ticket.
U10: One of our clients that come to the community center always forgets her wallet. Then the other participants have to pay the little fee for the restaurant. It would be nice if she could directly pay with ALFRED.
U9: But there are many security issues when it comes to paying with ALFRED. You can't talk aloud about your banking stuff. Maybe ALFRED should only manage a small amount of money and with advanced features for safety. You could have a small amount of credit on ALFRED that allows you to pay for social events with a simple but safe procedure.
U6: What about the battery life of ALFRED? I guess you have to keep it always on and with you, so the battery would have to be of a very good quality. ALFRED should also remind to charge it on time.
all: I would like ALFRED to be as small as possible. Suggestions are a ring, a necklace, bracelet or watch.

Summary (blackboard):

ALFRED should help social inclusion by offering:

- Cultural and social activities in the area and around

- Offer and demand based on interests. Not only on activities but also for social meetings (have a cup of coffee).
- Video calling on petition, in some cases it can be useful.
- Maintenance of contacts and add new contacts by specific authorization.
- Support to organize a group of people or event.
- Transport and navigation.
- Financial support (paying for an event, but only with small amounts of money and extensive security measures).
- Offer reminders for social events.
- Provide for medical control when doing activities

ALFRED must:

- Be small and wearable
- Be very user friendly
- Have visual support for people with hearing impairments
- Have a very user friendly support, set up as well as instructions integrated for its use.

E-Seniors (France): Group session Focus 2

13/01/2014

4 Attendees (from P1 until P4). Focus of the discussion on the ALFRED Pillar IV.

Participants: 4 women (3 seniors and 1 informal carer) (from P1 until P4). Three of them don't have any impairment; one doesn't see very well.

ESE started to explain how the focus group will be held. Then, ESE introduced ALFRED with the presentation elaborated with CHA & NFE. The video elaborated by ASC and translated in French was presented.

Then we asked each participant to introduce themselves (their name and how they know E-Seniors association).

One of the first reactions was about the fear of losing human interaction. Digital solutions can be a solution for active and healthy aging but not the only one, it must always be accompanied with the human interaction.

Alfredo wasn't clear to our participants, ESE explained it better. They were enthusiastic regarding the evaluating side of ALFRED (the fact that several apps can be developed even after the development of ALFRED), which enables ALFRED to respond the demand in the market.

One reaction after seeing the video was about games. Games presented were physical or cognitive. Some games « boring » according to the participants. So they were talking about imagination and its importance. Creativity must be a fundamental element and participants (P3 notably) want to use their imagination in the games.

I. THE PARTICIPANTS RELATIONS WITH ICT-TOOLS:

P1 (senior) is using a computer every day (mails, information, news). For her, it represents a permanent and valuable source of information. But she doesn't feel addicted to the screen. She noticed that some people, at her age, are more comfortable with tablets than with computers. She emphasized on auditory problems: if someone doesn't hear, he needs to see – but also the other way around; someone who does not see need to hear. These two dimensions (visual and audible) must be taken into account. She noticed also that, if someone is not used to ICTs, a computer seems more complicated than a tablet. She finally told us that men are more easily addicted to screens and this can be a break to mobility.

P2 (senior with visual impairment) is using her computer 2/3 times a day. It is a tool to write because she can customize the size of the letters in order to adapt the solution to her vision. She is using online dictionaries. She is not interested in images, she loves to read information. Internet is a wealth of information. The problem is how to classify all these information. She just bought a "e-reader" tablet. She doesn't have a Smartphone, just a regular cell phone. She knows that music can be saved in a Smartphone but she has another device for this use. For the moment, she does not one to have any other tablet as she as no one to help her when she has problems with ICT-tools. She wants to be sure that someone guide her in the tablet usage as often as necessary before she buys one.

P3 (senior) has a regular cell phone too. She would like to have a Smartphone but she thinks that her vision is not good enough. For her, a computer is a tool for everything (mails, reading, watching videos, games, movies, news, managing bank accounts…). She is talking about herself as a computer addict, and has a laptop with her when she is not at home. She is watching TV on her computer. She doesn't write on her PC but she is using it for anything else. Tablets and Smartphone are not the same for her and its use are different tools: she thinks that tablets are for home usage and the Smartphone are for the outdoor usage –this is due to their size. She is spending so many hours in front of her PC

that she doesn't have the time to do sports. She is riding an exercise bike machine in the morning while she is watching TV shows on her PC. To motivate her to walk, she needs goals and missions that could be given by ALFRED.
P4: Is an informal caregiver who is very connected and who has a Smartphone, iPad and laptop. She uses these tools to stay connected: mailing, social networks, different applications, new, administrative papers... She takes care of her grandmother who suffers from dementia and she thinks that ICT-tools, and solutions like ALFRED, could be a good way to stimulate the grandmother's memory.

2. OPEN DISCUSSION ABOUT THE ALFRED'S POSSIBILITIES

P4 (informal carer) suggested a game where people would be able to re-create a moment of their life with pictures and music. This could be a good way to stimulate the memory of persons who suffer from memory lost.
P3 were saying that in order to do exercise and to go out, people need goals and challenges. She underlines that the game should be fun in order to motivate to play. P4 told the participants about an App permitting to do scavenger hunts with a GPS. All the participants were very motivated to play this kind of game thinking that it could inspire them to do activities outdoors.
P4 is taking care of her Grandmother who has Alzheimer disease and suggested a functionality regarding the use of medicines and drugs. ALFRED should remind to take medicines and a validation system would be useful. Once the drugs are taken, the user signals it to ALFRED so that the system reminds that the days dosage is taken (in order to avoid the overdose).
P4 is using her computers every day for everything. She belongs to a generation for which computers are easy to use. She has one Iphone & one Ipad. For her, one of the key functionalities of the mobile devices are the picture management Apps that to take and treat images.
P3 asked what « To be fit » means? (*ESE asked how ALFRED could help to keep its users fit*). P1 (a doctor) said that 3 conditions might be united to be regarded as a person in good health : **mobility, vision, hearing**. P3 then told that it deepens of the age of the person.
P3 underlined that ALFRED should not give too much pressure for the user in the health related issues as she feels that the society sometime advices too much (for instance the slogan; eat five vegetables per day). She underlines that everybody must have the choice to monitor and get advice to the health related issues.

3. HOW ALFRED COULD STIMULATE THE USER'S MOBILITY WITH SERIOUS GAMES:

P3: Would like to have a dancing training (i.e. zumba) that ALFRED could propose as an App. For instance, ALFRED could propose some efficient movements with a music that goes along.
P4 suggested an online gym course like a videoconference. It would permit to practice sports at home but with some other participants. The possibility of having an avatar could be exploited. The course would be like a real one, for instance every Tuesday at 2pm, with a real teacher and if the participant is late, he is missing some part of the course. Alfred could send a reminder and if the user is agree with it, then connecting him/her to an online course. The fact that other persons participate in the course at a certain time could motivate more to take part in it.

P2 agreed that some sensors could be on the users, monitoring the heart for instance. At the end of the course, some healthy recipes could be proposed. Also, it is important that these activities does not take too long time, otherwise the users will get bored.
P3 thinks that it would be useful if ALFRED sent reminders for the sport lessons that are hold and in which the user is used to take part.
P1: like the idea where ALFRED proposes new music and songs that the user discovers. Then, the user could improvise some movements for the new music during one or two minutes. This would be a way to motivate user to move on it. It would permit to discover some new things and could increase mobility.
P3 liked very much this random selection which is really different of what we are use to deal with. She also knows an App that reminds a bit this idea (called Musicovery).
P2 would like to have an app helping her to know if what she is eating is healthy. There would be a grid where the user inserts the meal that she/he had and then ALFRED could analyse if the meal was OK and what could be improved. According to P2, it would be even more useful for people with special diet (who are not allowed to eat too much salt for instance). P1 agreed and was wondering about snacking in front of the screen, but finally partners agreed that is rather a problem among the Young computer users.
P4 suggested a game with old music. One could be to fill in the blanks in the lyrics of a song.
All participants agreed on the fact that games should be proposed to play solo and in groups.
P3 is a gamer: she told us that when people are playing role games (one of her favourite games is called URU), they are excited and they produce adrenalin. It is like a physical activity even though it is virtual.
P4 doesn't like games and is easily bored so the games should be short enough.

4. OTHER USEFUL FUNCTIONALITIES THAT ALFRED COULD HAVE:

P3: Would be nice to create a game with carers to share experiences with the user. For instance, ALFRED suggests a game where the caregiver could play together with the end-user, and this way improve their state of health.
P1: ALFRED should be able to provide information about all the different Apps that are available. As she thinks that lot of good things exist but it is very hard to find information about all the useful services that could be helpful for her. ALFRED could offer tips for Apps that it offers for the user according to their preferences.
P3: Also, ALFRED could propose daily the main news and what activities are offered during the day/week.
P2: ALFRED could help to find glasses, keys… A solution for lost important objects does not exist yet.
P3: One functionality could be about administrative papers. ALFRED could scan documents and keep it in order. For people who have memory losses, ALFRED could ask every day if there are some documents to scan.

5. CONCLUSIONS OF THE SESSION

All the participants agreed that all the generations should be "connected" in the virtual society, otherwise one gets isolated quite easily.
The participants wish the ALFRED Apps to help them:

1. Outdoors with a game that stimulates their memory but also makes them move. This game should include the good challenges in order to motivate the player.

2. To stimulate the memory with the games that use music and picture from the past of the user. Also a well known song with blanks to be filled could be a good way to work the cognitive capacities.
3. To participate in common courses and fit exercises: the fact to play with other persons motivates more to take part.
4. To eat in a more balanced way and follow a diet that is adapted for the user. Also a game that teaches the user in a fun way to eat better could be interesting.
5. To get digital services that is adapted for the senior user. ALFRED offer Apps for persons that have the both visual and audition trouble, which are often related to the ageing. Good visual aspects (colors, letter size...) and adapted audition functionalities (use of headphones or not) for the users are crucial.

E-Seniors (France): Focus Group Session 2

14/01/2014

6 attendees (from A1 until A6). Focus of the discussions on the ALFRED Pillar I.

Participants: 5 women and a man, all aged from 62 years old until 72 years old.

The participants did not have special impairment a part from small audition trouble that is related to the ageing.

ESE opened the session by introducing the whole project and the pillar 1 in particular.

One of the first reactions was that it is very interesting if ALFRED is easily extendable to the general population regardless the age but for persons who have a need for a support in their daily life.

1. THE PARTICIPANTS' USE OF ICT-TOOLS:

A2 is using her computer everyday especially for emails. She never used a tablet. She would like to have one but she is afraid to buy the wrong one. She feels lost because of Windows 8 and thinks that she needs an advisor.

A4 has a computer and a Smartphone which she is using to call, exchange emails even though she prefers to deal with it at home, localisation (GPS), apps for public transports, pictures… Tablets are seducing her because laptops are still quite heavy.

A3 has a computer. She is using Internet a lot. She doesn't have a Smartphone and she doesn't imagine herself with it in the street. She took courses to learn how to use a tablet but she didn't buy one yet.

A5 has a computer and a Smartphone. She is using it a lot, too much. She spends therefore a lot of time in front of a screen and that is why she is still hesitating about buying a tablet. She plays a lot especially mind stimulating games like Scrabble & Candy Crush, that amuses her in the public transports .

A1 is using a PC all the time. She doesn't want to play video games because she is too afraid to spend too many hours on it. She is using Microsoft Office a lot and, as it is not working on a tablet, she is reluctant to have one. The fact that tablets don't have a place to plug an USB is also a reason not to buy such a tool. But A1 likes the keypad of tablets.

A6 is using his PC and his tablet every day. He is also using his Smartphone when he is not at home to read his mails or the paper. A6 is using all these tools to communicate especially with his daughter who is living in Italy. For him, the most important aspect of the ICT-tools is the social inclusion and communication, which permits him not to feel lonely.

Tactile functionalities should be customizable.

ALFRED should provide some easy instructions of its usage and also some support should be available all the time.

2. REACTIONS RELATED TO DIFFERENT GAMES:

A3 told us that she have heard that some people says that video games are dangerous but in fact, according to a study she told us about, it is the opposite and gaming is stimulating different area in the brain. A1 didn't agree on that fact and thinks that it is the main reason why people have focusing issues. Finally, they got agreed on the fact that video gaming for seniors can only be a good thing because seniors can suffer from a lack of activities and also the games are an important way to stimulate the mind. A5 consider herself as addicted to video games; according to her it is important that the game sets some limits itself so that the user does not get addicted (for instance, a time limit in between of each match).

A1 underlined the importance of simple usage of the different Apps. She has trouble with her Smartphone applications that must be updated on a regular basis, and she gets

confused and forgets to do that. She underlines, that the configurations should not change too much for the older persons. Also, as that Apps change often, she thinks that the new Apps/ functionalities should be easily understandable for the seniors.
Several worries were formulated regarding targeted advertising, the participants does not wish ALFRED to send any targeted ads.

3. THE SPECIFIC FUNCTIONALITIES THAT ALFRED SHOULD SUGGEST:

A participant told us about the possibility to record voices with tablets and Smartphones. A2 told us that she would like to use functionality that automatically transcripts recorded voices to written text, which could be a kind of virtual secretary. It already exists but it is still approximately. A6 said that we entered in a new dimension with the Google glasses but the problem is that Internet connection is not possible everywhere, as a result he questions how ALFRED could be used in places without Internet connection.
Related to Apps that help to organize travels, A5 noticed that there are a lot of travel services offered by the Internet but some of them takes a lot of time and are a bit complicated to use, for instance, looking for the best price for a plane tickets. She told that it would be helpful if ALFRED could propose a travel organisation service (for booking transport tickets and hotels) that could be easy to use.
One idea formulated was: ALFRED could ask every day to its user if he/she is feeling ok, and the user responses. If the user has not responded/ done any activity with ALFRED, a message could be sent to the main contact person who could check that everything is OK.
Medicine reminder was suggested by A6.
A3 thought about connecting the user to different kind of services: plumbers, doctors (which kind, prices…), this service could be a kind of address book with easy access to good and quality services at the neighbourhood.
A2 was thinking about agenda and a meeting reminder. Sometimes, people can have an appointment at a doctor, for instace, and get the date 6 months before it, so it would be very useful if ALFRED could remind the user about the appointment. Furthermore, ALFRED could remind the user if he/she has some documents to bring to the meeting (an appointment to the doctor's for instance for which the patient should bring X-rays).

4. THE AMOUNT OF INITIATIVE FROM ALFRED:

A2 thinks that it would be fun if ALFRED took initiatives and posed spontaneously questions. She sees this option as a gadget which is positive for her.
A4 agree that ALFRED could initiate questions but it should be in the domains of interest of the User. Users could define their interests (for example, cinema, exhibitions, cooking...) and then ALFRED spontaneously could suggest targeted questions and ideas.
A6 underlines that if ALFRED spoke spontaneously, it should take into consideration the fact that seniors does not always hear very well, and also sometimes noises can disturb older persons.
A participants proposed that ALFRED could be programmed to ask spontaneous questions during certain times of the day (for instance during the breakfast time or so).
A1 said that it is important that ALFRED can be personalized and that the user can define its preferences in the different functionalities. This guarantees that the user is motivated to use the tool.

5. INITIATION OF A PHONE CALL

A3 thinks that it could be good if ALFRED initiated a phone call if it cannot provide a response for an important question.
A1 wants to activate herself the opportunity to call or not.
Also, it should be considered that ALFRED does not call to someone by mistake.

6. PUSH-TO-TALK

All the participants agreed that there must be a button that activates the vocal interaction. This is important as they want to decide when they speak to ALFRED and when not.

Charité (Germany): Focus Group session 1
30/01/2014.
5 participants (U7, U8, U10, U11, U12). Focus of the discussions of the ALFRED pillar IV.

U8 : Introduction
♣ Prior to the Pension employed as environmental engineer
♣ Has a PC and a normal mobile phone
♣ Has high blood pressure
Limitation of physical, mental , social activities (TUDA question)
♣ Generally not as physically strong
♣ From time to time be perceived slight loss of short term memory
♣ With the social interaction all is well
Executed Activities:
♣ Strength Training
♣ Aqua Fitness
♣ Online Chess
♣ Pilates
♣ Skippo (card game)
TV:
♣ New Flat Screen TV

U11 : Introduction
♣ pensioners
♣ Rejects Technology mostly
♣ Has a PC and normal (old) phone
♣ Pc is used only when necessary / write email
♣ Has deficiency symptoms
Limitation of physical, mental , social activities
♣ Physically definitely limitations but push ups go
♣ Cognitive limitations are not yet perceived
♣ Social contacts are available as always
Executed Activities:
♣ No Information
TV:
♣ Old Flat Screen TV

U10 : Introduction
♣ still working despite pension
♣ Pc much is used
♣ Mobile phone is used , but does not like using it
♣ High Blood Pressure / Cholesterol
Limitation of physical, mental , social activities
♣ sports (badminton)
♣ body also builds slowly from
♣ Set herself limits and decides when physical activities take place .
Executed Activities:

♣ Mountaineering
♣ badminton
♣ Swimming
♣ Computer Games
♣ games only if the family together (not home)
TV:
♣ New Flat Screen TV

U7 : Introduction
♣ previously medical doctor
♣ smartphone owner (it uses a little)
♣ Has a Tablet
♣ Pc used much
♣ feels healthy, but had a heart attack
Limitation of physical, mental , social activities
♣ Physically increasingly slightly restricted
♣ Sport is still performed
♣ Can imagine that memory lapses occur in connection with the attack . But does not suffer from that
♣ Social contacts are as usual , perhaps more through music
Executed Activities:
♣ Tennis
♣ Spider Solitaire
♣ Double head (card game) from time to time
♣ music in the orchestra / Home music games
TV:
♣ New Flat Screen TV

U12 : Introduction
♣ occupational therapist
♣ smartphone, tablet , pc for communication, time management , account management , Friends
♣ finds the devices are useful
Limitation of physical, mental , social activities
♣ Physical activities are increasingly being slightly harder to do, but everything goes very well
Executed Activities:
♣ beach volleyball
♣ Diving
♣ skiing
♣ With the son playing board games
♣ with the Tablet Games are played. Auto Racing (mostly with the Son)
TV:
♣ Flat Screen TV

What do you think of ALFRED ?

U10 :
♣ I could not imagine using it
♣ *to walk in the hand with a smartphone is too dangerous*
U11 :
♣ It Used to improve the mental or physical activity ?
U10 :
♣ I would refuse ALFRED.
♣ **To maintain Human contacts is more important to meet people Face to Face** .
U8 :
♣ A smartphone is a computer as well. The Pc is simply larger and therefore sometimes better in terms of user experience.
♣ but a smartphone also has its advantages .
♣ U8 : *This ALFRED device has to be custom programmed for every user it needs a person who programs the device individually for each user.*

U11 :
♣ Could imagine to use ALFRED.
♣ *Normal communication is lost by the use of such a device and after switching off the device it can come to problems to switch to normal channels of communication (talking in person)*
U7 :
♣ *It is inacceptable for me to use such a device .*
♣ *idea to use it is unacceptable.*
♣ I prefer to choose myself the the things I want to do for my interests .
♣ The use of "wiping on the screen" I like that.
♣ To programme the device myself should be possible.
♣ The given structures restrict me.
♣ Internet is public and therefore no fear of data transfer
U12 :
♣ Use it as navigation and considers it important
♣ would find a taxi app useful
♣ Facebook expanded my contacts
♣ The way in the outside-world has become easier through such devices
♣ Patients could take a photo of their premises and send it to me . Then I could pre-orientate myself
♣ The modern terms " Apss ", " smartphone" , etc., are incomprehensible to many persons.
U11 :
♣ Have little time
♣ To Make appointments I would use the app .
♣ A tablet or smartphone is just quicker on the table as a computer
U7 :
♣ *A search-function could propose all sports in the area*. Could be difficult with the indication of paid and free offers.
U8 :
♣ A cell phone is for the short-term communication.

♣ *Information should be gathered on the Pc*

Brain Writing:
Anomaly Detection
Importance for participants (3 points Blue)
• *Video connection to "emergency rooms"/carers to reduce inhibitions to set off an emergency call e.g. "My husband is so funny ?" The rescue center/carer has such a first impression on the condition of the ALFRED user*
♣ Must not be 100 % accurate , but easy to hande.

Importance for participants (1 point Black)
• An app daily reminded :
♣**To measure hypertension**
♣ take tablets
♣ to control the weight

• " No, I do everything myself " limitation of aid only on games (Moorhuhn Game)
♣ Information about score
♣ As a result, more knowledge on the game
♣ To achieve greater speed

• Notes and correcting poor posture , for example, in the PC work .
♣ counteract the bad posture

• Notes for lowering high blood pressure and encourage to exercise for high blood pressure patients
♣ ***exercises to counter bad habits or posturers***
♣ **Hints and Tips on the phone how to avoid risk factors of high blood preassure etc..**

• **memory loss**
♣ **(games) that display memory loss or give information on cognitive ability**
(compared to other users)

- Motivate healthy users to stay active and healthy by tips and videos
- Supervise more ill persons with sensors and set alarm in anomaly occurs

• For " fittest " Older only indirectly as an indication of an anomaly. Be self-employed and control . For frail elderly , however, transmission of data (eg ECG) to the doctor and prompt reaction of the family doctor

General Reviews: Anomaly Detection :
U8 :
♣ **reminder for health related things.**
U11 :
♣ evidence of body-posture misalignments on the PC.
U10
♣ Motivate people be take the initiative themselves before contacting carers

- Even take the initiative , then get once the help of caregivers.
  ♣ Only with limited physical abilities support.
  U7 :
  ♣ One should make a distinction between " Fit and unfit " ALRED users
  U12 :
  ♣ connect Heart Rate Monitor to the phone.
  ♣ transmitting data to carer for checking on the health data.
  U7
  ♣ videophone for an emergency call.
  ♣ Medical data transmission only in serious life threatening cases
  ◊ crisis intervention

Brain Writing: individualization
Importance for participants (1 point Blue)
• recognition algorithm for user preferences / needs. "Learning software " for easier handling of ALFRED

• **Learning Games and Sports Games**
♣ requirement is the limited mobility
♣ If active physical integrity , its own actions the person is advised .
Importance for participants (2 points Black)
• Personalisation and computer control are opposites.

Importance for participants (1 point Black)
• Note on training specific muscle groups (back muscles) .

General Reviews: individualization
U7 :
• Adaptation of ALFRED to the users abilities should be individually possible.
U8
• What professional could give me personally my matching exercise program show to control myself at regular intervals **(Virtual Personal Trainer).**
• control of physical exercises with sensors

Brain Writing: Coordination / motivation
Importance for participants (4 points Blue)
• **Library Services / Fine Arts should include virtual library and access the museums virtually and to music (fine art) VERY HIGH PRIORITY OF ALL USERS**
♣ example : A game with pictures, with which you can deal with (Memory game in a gallery)

- **Games were you can be creative (drawing/music)**
  ♣ link with other interested parties (exchange).

Importance for participants (2 points Blue)
• **Play with others who run into a fantasy world (the Middle Ages , knights). Escape**

to places you can t go anymore or that are financially out of reach.

• A personal contact partner in the game.

Importance for participants (1 point Blue)
• " app" to a motivate during the week at certain times to do certain sporting exercises that change daily .(constant change motivates)

Importance for participants (1 point Black)
• games that require the coordination of mental and physical exercise , such as opposing motion exercises of the arms and legs

• Calorie Calculator
♣ consumption of Kcal allows , for example, 1 piece of cake

General Reviews: Coordination / motivation
U12 :
• Memory games with images of different subjects depending on their interests (eg, architecture, technology, arts)
• Sports Games
♣ have sports/games that cannot be practiced on reality anymore real (more) (eg, flying, parachuting , diving , ski jumping)
• reward system / bonus for regular attendance of the programs
♣ Publication of results : + incentive / - shame
U7
• There should be a motivation
U8 :
• Motivation for athletic exercises schedule / make suggestions .

Brain Writing: Holistic Training
Importance for parti
• games that require the coordination of mental and physical exercise , such as opposing motion exercises of the arms and legs
cipants (1 point Blue)
• Training to promote complex thinking

Importance for participants (1 point Black)
• Training for the detection of functional relationships

General Reviews: Holistic Training
U11 :
• Training for specific muscle groups .
• exercises for hypertension .
• promote complex thinking.
• coordination of mental and physical abilities .
U12 :
• fictional reality games can stimulate the imagination .
• significant risk through movement games by unilateral movements.

U10 :
• **Training for speed in games.**
• Exercises are reflected outdated and checked after a certain period .
U8 :
• Virtual Personal Trainer
♣ checked after some time by real people.

Brain Writing: user safety
Importance for participants (2 points Black)
• **Medication planner**
♣ **Health recommendations by the app**

Importance for participants (1 point Black)
• Specified game objectives , and possibly paths which are controllability at the end of the game. Is the goal of players has been reached ?

General Reviews: Holistic Training
U11 :
• **road to achieving the objectives**

Charité (Germany): Focus Group session 2
03/02/2014
5 participants (U2, U3, U4, U5, U6). Focus of the discussions on the ALFRED Pillar III.

Presentation U4 :
- Before retirement Software Developer
- No Tablet
- Has your phone and PC
- Care of the Father
- Used to be able to run faster , eyes were better
- Socially , everything is as before
- Plays on the PC no games
- Plays Canasta
- Going daily with the dog for a walk in the woods
- New phone, flat screen TV and two tube TV , Laptop

Presentation U2
- pensioner
- Use computer daily to obtain information and to write letters
- Foster parents , mother and father 95 98
- If the previous speaker Connects (formerly could run faster, eyes were better Socially everything is as before)
- Has become forgetful - has developed mechanisms to deal with it
- No games on the PC
- Halma
- Formerly Volleyball
- Laptop, " inherited mobile " , no TV

Presentation U5
- Nothing to do with technology at the Hut - PC has Husband
- Teacher of Art
- Prefer to deal with people as with technology
- Shortness of breath ,
- Become forgetful
- Swimming, cycling , skiing
- Had earlier huge circle of friends - they would no longer to the extent that needs more time for yourself
- Used to be a PE teacher - many ball games with the children
- Double head , Rummy Club ,
- Board Games - Ludo , Memory
- Old TV , old cell phone , laptop

Presentation U6
- Navy officer for warships
- After retirement - Managing in the hunting club , editor of web portal
- Mental functioning no deterioration
- Large circle of friends
- Currently not a sport , had pulmonary embolism

- Formerly run marathon jogging, daily
- Formerly volleyball, handball, football played
- No PC Games
- Flat screen TV , smartphone, tablet

Presentation U3
- Occupational therapist , studied teaching for nursing
- Works in hospital in orthopedics
- Because studying little social contact and forgetful
- Computer Games - Spider solitaire
- Ludo , Nobody's Perfect, Rummy, Crazy Eights , Poker
- Badminton , Volleyball
- Large flat screen TV , smartphone, computer , PC, Netbook

What do you think of ALFRED ?
U4
- Security concerns, the Internet is tapped
- Is not going to stop
- Health data are sensitive data

U3
- How do doctors deal with data ?

U6
- Does not look technical prerequisites as given within ALFRED
- Maybe later ALFRED can be implemented, but not in the next 10 years

U2
- As Affected older person she finds Alfred very useful
- only one button on the device she finds very good
- will need time to adapt to technical device
- With touch screen there should be tactile feedback when command has been accepted –
- Linguistic connection - ALFRED should speak very clearly and loudly
- Pain recognition is very good, because older people do not express pain their
- Record of movement , mobility, she is also very good to show reality
- Real facts , subjective perception and objective facts

U6
- Control of movement / mobility is monitoring , this would not have a mentally fitter man
- In people who suffer from dementia , monitor activity radius/dementia

U5
- Does not need for technology use
- Skepticism about technology

U2
- It is important to consensus -discuss together with users, which can be applied

Find compromise ,

U5

- Before they would go into the home , they would prefer to use technology

U3

- Is the aspect to use to suit individual preferences with Facebook comparable
- There also are data collected and proposed functions
- Criticism , Facebook tricky
- Another point is job of the therapist or nurse replaced by

U6

- Also costs money again

Brain Writing:

common intersection
Importance for participants (1 point Blue)
- Only make those opportunities possible , the wishes of ALFRED participants
more points
- Me and ALFRED : Memories of certain regular "duties"
- By pressing a button to contact with nurses or doctor or good friends
General opinions :

U2

- Develop basic unit , which is expandable , but keep the look constant
social integration
Importance for participants (1 point Blue)
- Enable - communication Aphasia
Importance for participants (2 points Black)
- Communication with other participants ALFRED
Importance for participants (4 points Black)
- Interactive games with friends
more points
- Daily structure
- Contact for therapeutic / nursing staff
- Several sub-items in the menu for more "partners" (friends , therapists ...)
- Good design inconspicuous to wear as well as older " vain " are

nursing control
Importance for participants (1 point Blue)
- Measurement of health data
- Check or measure blood pressure and heart rate
Importance for participants (2 points Black)
- If I remove ALFRED , such as memory , ALFRED next day etc. again carry
Importance for participants (3 points Black)
- Control of fluid intake
more points
- For ailing person , for example, monitoring of blood pressure and other health features
- Tablets
- Information to nurses , then to Nursing

Personal Safety

Importance for participants (1 point Blue)

- Monitoring of vital functions heart , breathing, movement with automatic alarm
- As Caregivers : Info about crash , fainting , bruising
- Coupling with rollators
- The easiest access to the device ; loud and slow speech
- Rapid heart attack or stroke in connection with the fire department

Importance for participants (2 points Blue)

- Check by pressing a button or home health data security

Importance for participants (4 points Blue)
- Help in case of accidents or falls in house

Importance for participants (1 point Black)
- Control of household appliances, and lighting, heating, shade , automatic shopping list

Importance for participants (2 points Black)
- Coupling with rollators

more points
- By accident communication with doctor or hospital
- Me and Alfred : Security in the home
- Warning of danger of falling
- Or similar diversion to alternatives Bluetooth - at power failure
- Vibratory feedback when operating
- When demented people aware of the " sphere of influence "
- Can act acoustic, optical and mechanical signal together
- Common intersection by pressing a button

General opinions:

U6
- Interaction with care services leads to cost
- Warning of danger of falling (where are dangers where is cable is ground wet) - networking with other systems

U3
despite health limitations ALFRED can help to continue to live at home

other
- Integration into new forms of living

Appendix 3

Focus Group Guideline

WP2 Concept, Requirements and Specification

Guideline for the ALFRED Focus Group Sessions

Deliverable Lead: ESE

Contributing Partners: CHA, NFE, ASC, TALK

Delivery Date: 02/2014

Version 0.4

Short Abstract

This document is for internal use of the ALFRED partners and it aims at providing equal circumstances for the ALFRED Focus Group sessions that are carried out in the Task 2.3 User Stories and Requirements Analysis.

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Note

This deliverable is subject to final acceptance by the European Commission.

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Project Partners

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Worldline, Spain	Charité - Universitätsmedizin Berlin - Department of Geriatrics, Germany
Asociacion de Investigacion de la Industria Textil, Spain	Technische Universität Darmstadt, Germany
National Foundation for the Elderly, The Netherlands	Talkamatic AB, Sweden
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Executive Summary

This document is designed for internal use of the ALFRED consortium with the aim of providing common guidelines for the ALFRED Focus Group Sessions that are carried out by the end-user organizations of the project (ESE, CHA and NFE). These guidelines will specify the common circumstances for the Focus Groups, which will enable the equal treatment of the end-user participants in the three end-user countries of the ALFRED project (i.e. France, Germany and Netherlands).

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1 Introduction

The following text needs to be adapted and used in every single ALFRED deliverable. Its purpose is to give a general introduction to the project for these people knowing little or nothing about the project. The following introduction of chapter 1 (without the last clause) as well as the subchapter 1.1 can be directly copied to your own deliverable, the remaining subchapter need to be altered or extended. The following example is taken from D2.1.

ALFRED – Personal Interactive Assistant for Independent Living and Active Ageing – is a project funded by the Seventh Framework Programme of the European Commission under Grant Agreement No. 611218. It will allow older people to live longer at their own homes with the possibility to act independently and to actively participate in society by providing the technological foundation for an ecosystem consisting out of four pillars:

- **User-Driven Interaction Assistant** to allow older people to “talk” to ALFRED and to ask questions or define commands in order to solve day-to-day problems.
- **Personalized Social Inclusion** by suggesting social events to older people, considering his interests and his social environment.
- A more **Effective & Personalized Care** by allowing medical staff or carer to access vital signs of older people monitored by (wearable) sensors.
- **Physical & Cognitive Impairments Prevention** by incorporating serious gaming to improve the physical and cognitive condition by offering games and quests to older people.

Within this deliverable, the overall project vision in terms of its general positioning, the project’s business and research/technological objectives will be revealed. Further, the project stakeholders, the underlying vision enablers, and some preliminary usage scenarios will be presented.

1.1 ALFRED Project Overview

One of the major problem today is the increasing isolation of older people, who do not actively participate in society either because of missing social interactions or because of age-related impairments (physical or cognitive). ALFRED will allow overcoming this problem with an interactive virtual butler for older people, which is fully voice controlled.

The ALFRED project is wrapped around the following very clear main objectives:

- Empowering people with age related dependencies to live independently for longer by delivering a virtual butler with seamless support for tasks in and outside the home. The virtual butler ALFRED will have a very high end-user acceptance by using a fully voice controlled and non-technical environment.
- Prevailing age-related physical and cognitive impairments with the help of personalized, serious games.
- Fostering active participation in society for the ageing population by suggesting and managing events and social contacts.
- Improved care process through direct access to vital signs for carers and other medical stuff as well as alerting in case of emergencies. The data is collected by unobtrusive wearable sensors monitoring the vital signs of older people.

To achieve its goals, the project ALFRED conducts original research and applies technologies from the fields of Ubiquitous Computing, Big Data, Serious Gaming, the Semantic Web, Cyber Physical Systems, the Internet of Things, the Internet of Services, and Human-Computer Interaction. For more information, please refer to the project website at http://www.alfred.eu.

1.2 Deliverable Purpose, Scope and Context

The purpose of this internal document is to act as a guideline in the Task 2.3 User Stories and Requirements Analysis. It sets the common conditions for the Focus Groups that are organized by the ALFRED end-user organisations in France, Germany and Netherlands.

This document is confidential and cannot therefore be used by external parties. The document primarily aims the project partners and it is a part of the methodology for the End User involvement in the project.

1.3 Abbreviations and Glossary

A definition of common terms and roles related to the realization of ALFRED as well as a list of abbreviations is available in the supplementary document “Supplement: Abbreviations and Glossary”, which is provided in addition to this deliverable.

Further information can be found at http://www.alfred.eu.

1.4 Document Structure

This deliverable is broken down into the following sections:

Chapter 1 provides an introduction for this deliverable including a general overview of the project, and outlines the purpose, scope, context, status, and target audience of this deliverable.

Chapter 2 provides a general description of the methodology used for defining the ALFRED user requirements in cooperation with the end-users.

Chapter 3 defines the different participant’s profiles that are invited to take part of the ALFRED Focus Group session. These possible profiles will be used throughout the ALFRED project.

Chapter 4 details the proceedings for the Focus Group sessions that are hold during January 2014 in France, Germany and Netherlands.

Chapter 5 considers the Ethical issues that are related to the User Requirement phase.

2 Objective and Setting for the Focus Groups

2.1 Goal of the Group Discussions

The end user organizations will organize focus groups with the active participation of older persons to define their needs for ALFRED Apps and functionalities.

The advantage of a focus group is that older persons can exchange their ideas in a free way, which will enable the ALFRED project partners to acquire a deeper understanding about its user groups, their needs and ideas.

The focus group session will consist of a brainstorming session on one of the ALFRED pillars:

- Pillar 1 User Driven Interaction Assistant
- Pillar 2 Personalized Social Inclusion
- Pillar 3 Effective and Personalized Care
- Pillar 4 Serious Games for Physical and Cognitive Impairments prevention

The results of these brainstorming sessions will be put into user stories.

Each user story will define a very small part of the requirements definition. In the end, these stories will be grouped by themes. The definition and analysis of the user stories will be coordinated by geriatric scientists (CHA).

2.2 Setting for the Group Discussions

A total of six separate focus groups will be carried out in task 2.3, and each of three end-user organizations will carry out two focus groups related to the pillar in which they will target during the ALFRED project. In each focus group there will be five participants. Each focus group will have one observer from the end user organization. In total, around 30 participants will take part in the groups that are organized by the end-user organizations of the project; by E-Seniors in France, the National Foundation for Elderly in Netherlands and Charité Department of Geriatrics in Germany. The end-user organizations have split the ALFRED pillars according to their expertise in order to get a better focus on the end user involvement. Each focus group session will discuss one pillar. The following summary (see reference 1) reflects the pillar each organization focuses on.

Reference 1: Focus of each end-user organisation in the different ALFRED pillars

Organisation	ALFRED pillar	ALFRED pillar
NFE	Pillar 1	Pillar 2
CHA	Pillar 3	Pillar 4 (in the perspective of rehabilitation)
ESE	Pillar 1	Pillar 4 (in the perspective of prevention)

2.3 Time Planning for the T2.3 and D2.3

The Deliverable 2.3 “User Stories and Requirements Analysis” is due on 28/02/2014 and the internal review is foreseen for the 14/02/2014, for this reason all the action must be well planned and coordinated by the end-user organizations and the involved partners.

In Table 1 is the planning for the Task 2.3 and for the writing of deliverable 2.3 foreseen.

Table 1: Time Planning for T2.3 and D2.3

Task	**Deadline**
Recruitment of the Focus Group participants in France, Germany and Netherlands (approx. 10 persons per country)	07/01/14
Organisation of the Focus Groups in the 3 countries (i.e. data gathering)	• *In France, on the 13/01/14 and on the 14/01/14* • *In Germany the 30/01/14 and 03/02/14* • *In Netherlands23/01/14 and 24/01/14*
Formulating of the User Stories from the FG results	During the 15/01/14 – 21/01/14
Elaborating the D2.3 (notably the Literature study part)	02/01/14 – 27/01/14
Analysing the User Stories and including those in the D2.3	27/01/14 – 30/01/14
First Internal review of D2.3	31/01/14
Fine-tuning of D2.3	01/02/14-7/02/14
Final Internal Review of D2.3	10/02/14- 14/02/14
Finished D2.3 User Stories Report	28/02/14

3 Participants of the Focus Groups

3.1 Older Persons in Focus Groups

Each focus group will involve 5 to 6 persons who are stakeholders in ALFRED as final end users.

The end-user participants are older persons (60+) from different backgrounds. Age is not the most important determinant. The most important aspect is that these people are creative, have a vision and can really contribute to the idea of ALFRED.

3.2 The Involved Participant Profiles in Each ALFRED Pillar

In addition to the Older Adults, professionals from different domains related to the relevant pillar will be invited to take part in the Focus Groups (such as IT experts, logopedic, (informal) caregivers, business development, and wellbeing organizations, such as Red Cross) (see Table 2). These are people who have an expert view and can see the wider scope of ALFRED.

NFE, CHA and ESE have defined different participant profiles for each session (per pillar). People that reflect one or several of these participant profiles are invited to take part in the ALFRED focus groups. For example an older person can be at the same time an informal caregiver, but also a former GP or physiotherapist.

Table 2: Possible Participant Profiles Involved in the Different ALFRED Pillars

Pillar and Partners in charge	Possible Involved Participants
Pillar I (NFE, ESE)	• Older adults that are living at home (60+). They may experience some need for support in their activities of daily living. They can have different backgrounds in (for example) IT, business, care, physiotherapy, etc. • Informal caregivers (relatives, family members, partners, etc.) • Social workers or carers, people that used to work or are still working for public or private organisations acting in the field of social wellbeing, home care, activity centres or charities.
Pillar II (NFE):	• Older adults that are living at home (60+). They may experience some need for support in their activities of daily living. They can have different backgrounds in (for example) IT, business, care, physiotherapy, etc. • Informal caregivers (relatives, family members, partners, etc.) • Social workers or carers, people that used to work or are still working for public or private organisations acting in the field of social wellbeing, home care, activity centres or charities.
Pillar III (CHA):	• Older adults with health issues but no serious medical problems, as the persons need to be fit enough to participate in the ALFRED discussions. However some kind of tracked health issue is needed in order to share the health data. • Informal caregivers (relatives, family members, partners, friends, etc.) • General practitioners (Physiotherapist, Occupational Therapist, Speech Therapists, Dieticians, other allied health Professions) • Formal caregivers/health service provider • Examples: Johanniter, Red Cross, local activity center, Technician (expe. Ser. Gaming, and AITEX)
Pillar IV (CHA: rehabilitation and ESE: prevention)	• Older adults who like to have assistance in their daily life (60+) and who are living at home (prevention point of view) • Older adults with health issues but no serious medical problems, as the persons need to be fit enough to participate in the ALFRED discussions. (rehabilitation point of view) • Normal older adults therapist (i.e. Physio, Ergo, Neuropsychologis...) • Technician (serious game expert...)

4 Structure of the Focus Group Session

4.1 General Information Regarding the Session

- Duration, max. 2.5 hours.
- A meeting space (a room with natural day-light)

All the material needed for the Focus Groups will be provided by the end-user organisation that organise the session in each country. All the end-user organisations must give the same material at the participants' disposal, as this ensures the equal treatment of all the stakeholders. Table 3 details all the material that must be foreseen for each Focus Group session.

Table 3: Material needed for the Focus Group

Material	Comment
ALFRED presentation	A short PowerPoint Presentation about ALFRED that is translated in French, Dutch and German (also the ALFRED clip is used)
Video-projector + white screen	For the presentation
Audio recorder	To record the discussions
ALFRED flyers	Those are translated in French, German and Dutch informing the participants about the project.
Informed Consent Forms	These forms are translated in French, German and Dutch (see the common format in English; Appendix 1)
Participant's Background Information form	A short form where the age, the professional status, the state of health, the living environment, the education, the usage of ICT is asked (see the common format in English; Appendix 2a and 2b).
Material for gathering the user stories	Video recording. From the ideas of the participants discussions will arise about what ALFRED would do in specific circumstances, giving us direct input for the user stories. After transcription of the recordings a categorization of the statements will be done. The categories should be leaned on the ALFRED Pillars/ Pillar questions that are developed in this guideline together with the partners of the consortium. Each statement of the categorization process is one user story.
Material for taking notes	At least paper and colourful pencils are needed so that the participants can write or drawn down their essentials ideas that they want to share with all the participants. These documents will be collected and analyzed as all data driven from the Focus Groups.
Refreshments	Some water, coffee, tea and biscuits should be provided for all the participants.

4.2 The Focus Group Scheme

Each Focus Group Session will take approximately 2 hours and 30 minutes.

All the participants who take part in the ALFRED Focus Group have signed the Informed Consent (see Appendix 1) before the session. Also, the participants are asked to fill in the Form “Information about the Participant (see Appendix 2).

All ALFRED Focus Group sessions will follow the same Scheme:

- **ALFRED presentation** (15min): the moderator objectively gives an overview of the ALFRED project and presents the objectives of the focus group (this will be done with a PowerPoint presentation that NFE, CHA and ESE have created together + the ALFRED video). It is very important that the participants understand the purpose of the ALFRED platform and its limits so that they can provide the project partners with relevant feedback. The general definition and scope of the related Pillar is given by the moderator (e.g. What is social isolation? What means interaction with a technical device?)
    - **Discussion:** what do you think of ALFRED? (20min): The discussion is based on the presentation; the feedback is recorded and transcript.
- **Pillar question** (see page 7) (in total 1h 10 min): The moderator gives the big open question (see reference 2) and some definitions if necessary.(5min)
    - **Start with Brain writing** (5min) – each participant will have 5 minutes to write down the first ideas that come to his/her mind.
    - **Discussion and brainstorm** on innovative ideas and functions that would be necessary or nice to have in the ALFRED prototype.(30min)
    - **Discuss the ideas** (30min) – discuss the ideas and notably collect the pros and cons: finally try to come to about 4 main ideas that should be functionalities of the ALFRED pillar.
    - **Presentation of the collected ideas** through sketches, building blocks or other material (30min). After reaching the final innovative ideas on the different functionalities of ALFRED, the participants will either be asked to present their ideas on their own or the moderator will collect and present them, so that all partners can grasp the idea of the innovation. Participants will receive different materials to present it with pens and paper, photos from magazines or other material. In the end the idea is that the participants then present the idea in 5 minutes using the ‘prototypes’ that they have made or that the moderator does it if the participant does not feel confident enough.
- **End of the Session**

4.3 Questions for each ALFRED pillar

During the Focus Groups, the idea is to pose open questions for the participants. These questions are the basis for a brainstorming session for participants to think of innovative solutions.

- Example: Pillar III: How ALFRED should support your personal health?

The idea is that only one question is asked in the Focus Group, which will open the discussions (seeTable 4). The aim is to have a free exchange of opinions and ideas in a

brainstorming session. This will give room for participants to think what is important for them.

All the ideas are recorded and the user stories are driven from the brainstorming sessions. The last part of the focus group is focused on getting their message over to us and other partners. This is done through the presentation of their ideas in sketches or similar, this will depend on the inspiration of the Focus Group participants.

In case important aspects of ALFRED will not find an entrance in the discussion process the moderator could ask additional questions.

Table 4: Focus Group Questions for each ALFRED Pillar

Pillar I	Pillar II	Pillar III	Pillar IV
How ALFRED should support your day to day activities at home?	By what means ALFRED should include other people in your life?	How ALFRED should support your personal health?	• In what way ALFRED should help you to get healthy again? (Rehabilitation/ CHA) • How could ALFRED help to keep users fit? (Prevention/ESE)

5 Ethical Issues during the Focus Groups

All participants involved in the ALFRED project phases take part in the project on a voluntary basis and they are informed about their participation before any action takes place. All participants have been asked to sign the informed consent and they are informed that the project respect the Data Protection Directive of the European Union (95/46/EC).

5.1 Clinical Perspective

As mentioned earlier in this document, the ALFRED prototype will not be a medical device but a health assisting tool with which the users can share and communicate data about their health status. In consequence, the ALFRED project will not make any medical diagnosis or treatment for the seniors. For this reason, no clinical trials according to the medical device directive will be accomplished and the vote of the Ethical Commission of the Charité Geriatrics Hospital (CHA) is not a precondition. However, an assessment of the data protection officer will be performed at the Charité.

5.2 Personal Data Protection

The ALFRED project will be conducted in conformance to the European Data protection Directive (95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with the regard to the processing of personal data and on the free movement of such data). This regulation ensures that the personal data will treated with a high standard of protection everywhere in the European Union.

Therefore, ALFRED will respect Article 6 of the Directive stating that personal data must be:

(a) Processed fairly and lawfully.
(b) Collected for specified, explicit and legitimate purposes and not further processed in a way incompatible with those purposes. Further uses for scientific and statistical purposes are permitted subject to § 46 and 47.
(c) Adequate, relevant and not excessive in relation to the purposes for which they are collected and/or further processed.
(d) Accurate and, where necessary, kept up to date; every reasonable step must be taken to ensure that data which are inaccurate or incomplete, having regard to the purposes for which they were collected or for which they are further processed, are erased or rectified.
(e) Kept in a form that permits identification of data subjects for no longer than is necessary for the purposes for which the data were collected or for which they are further processed. Member States shall lay down appropriate safeguards for personal data stored for longer periods for historical, statistical or scientific use.

Furthermore, in line with the Article 7 of the Directive, all processed personal data will be collected during the ALFRED project only with the given consent of the data subject.

5.3 Informed Consent

All the Focus Group participants have to sign the Informed Consent form that states that they understand the issues related to their participation in the ALFRED Focus Group (See the Appendix 1).

Appendix 1

PARTICIPANT'S INFORMED CONSENT FOR ALFRED FOCUS GROUPS

Me, the signatory,

Surname	
First Name	

accept freely and voluntarily to participate in the focus groups of the ALFRED project. I certify that I have been informed about the ALFRED project and that I have received all necessary information regarding my involvement in this phase and had sufficient time to decide whether I want to participate in this discussion. Furthermore, I confirm that I have had an opportunity to ask questions about the details of my involvement in the focus group and other aspects of the ALFRED project.

I understand that,

- My participation is voluntary, free of charge and I can withdraw from the group at any time and without delay;
- I can obtain, correct and delete the information derived from my participation in the focus group discussions;
- The focus groups discussions will be recorded (audio and video);
- All collected information will be analysed for research purposes only and can be used anonymously in ALFRED project related publications

Date: DD / MM/ YYYY

Place:

Signature:

Appendix 2

Form 1 to be used by NFE and ESE

BACKGROUND INFORMATION ABOUT PARTICIPANT

Family name:	
Gender:	☐male ☐female
Year of birth:	19____
Nationality:	
Residence:	☐rural residence ☐urban residence
Living situation:	☐alone ☐with partner ☐with friend ☐with family ☐other, who?
Education:	☐primary education ☐GSCE ☐A-Levels ☐Ba/Ma ☐doctorate ☐other, what?
Employment status:	☐retired ☐part-time employed ☐full-time employed ☐self-employed ☐unemployed ☐voluntary work ☐housekeeper ☐other, namely:
(Former) occupation:	
Your use of ICT Tools (computer, smartphone, tablets...):	☐Daily Use ☐Weekly Use ☐Monthly Use ☐Rarely ☐Never
For what do you use ICT Tools?	☐Mailing ☐News ☐Communication ☐Working ☐Other; what?

Appendix 3

Form 2 to be used by CHA.

BACKGROUND INFORMATION ABOUT PARTICIPANT

Name:	
Gender:	☐male ☐female
Year of birth:	19____
Nationality:	
Residence:	☐rural residence ☐urban residence
Living situation:	☐alone ☐with partner ☐with friend ☐with family ☐other, who?
Education:	☐primary education ☐GSCE ☐A-Levels ☐Ba/Ma ☐doctorate ☐other,what?
Employment status:	☐retired ☐part-time employed ☐full-time employed ☐self-employed ☐unemployed ☐voluntary work ☐housekeeper ☐other, namely:
Your use of ICT Tools (computer, smartphone, tablets...):	☐Daily Use ☐Weekly Use ☐Monthly Use ☐Rarely ☐Never
For what do you use ICT Tools?	☐Mailing ☐News ☐Communication ☐Working ☐Other; what?
Health history:	☐ Heart Problems ☐ Diabetes Mellitus ☐ Asthma ☐ High Blood Pressure ☐ Back Problem ☐ Recent Surgery ☐ Physician`s advice not to exercise ☐ Smoking ☐ Medication ☐ Joint Problems ☐ Stress ☐ High Cholesterol other:_____
Current employment position:	_____ _____
Years of Job experience:	_____