Voice Controlled **Assis**tive Care and Communication Services for the Home

D4.1 – Evaluation and Assessment Plan for the Lab and Field Trials

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Abstract

This document describes the evaluation and assessment plan for the system evaluation of the vAssist system within standardized lab trials and a long-term field evaluation. The evaluation processes will focus on the communication and tele-medicine services, which will be available on the system prototype. End-users of the target groups will be invited to evaluate the system. Results of each trial will contribute to the subsequent development and modification processes of the vAssist system.

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1 Introduction

vAssist provides specific speech/voice controlled home-care and communication services for seniors who show age-related restrictions in their fine motor skills, vision and/or hearing, have symptoms of AAMI (Age Associated Memory Impairment) but are not diagnosed with cognitive impairments. The main goal is the development of simplified and adapted interface variants for tele-medical and communication applications using multilingual speech and voice interaction (and supportive graphical user interfaces where necessary). vAssist aims to enhance the perceived quality of healthcare services and to enable a reduction of costs related to their production and delivery by achieving channel independence in the delivery of vAssist services, so that existing hardware and interfaces in the home of the users can be used (e.g. Smartphone, PC, TV).

1.1 Background

1.1.1 User Requirements

Document D2.1 (User requirements) Chapter 8 summarizes the results of the user requirements analysis. vAssist has to deal with primary users (seniors) and secondary users (formal and informal caregivers). Devices to be used to interact with vAssist are mobile devices (at home and out of home) and static devices (at home). The expected services are: making phone calls, write emails, SMS, MMS to relatives, friends, etc., manage the contact information and share information like photos etc. with family and friends. Well-being services are also required including emergency functionalities (calls, tele-alarm), recording and reporting of medical data, drug intake reminder and drug diary, electronic pill jars and the information exchange between user and health professionals.

Although voice based interaction is preferred, a text or graphical user interface should be in place to allow for monitoring and/or controlling the interaction process.

1.1.2 Service Provider Requirements

Document D2.2 (Service provider and business requirements) describes the requirements of service providers. The key requirements of service providers are the request for a maximum of flexibility that should be offered by the architecture to be able to allow for the integration of existing services with minimal effort and to enhance or replace vAssist modules during the lifecycle of the vAssist platform to respond to business needs as fast as possible.

1.1.3 System Definition

Document D2.3 (System definition) describes the technical aspects and logical structure of the vAssist platform and its individual system components designed on the basis of the results of the user requirements analysis. It includes the specification of the service interaction processes and their integration into scenarios. The interaction of the individual components and their interfaces are described in detail in order to allow each partner to start the development of components or to go into a more detailed level of specification as required by the components, according to the partner's development process model.

1.1.4 Scenario definition

Document D2.4 (Scenarios definition) illustrates the business and service scenarios based on user requirement data from the target groups. Business scenarios refer to purchase, setup and the maintenance of the vAssist system. Service scenarios encompass contact management, audio call, E-Mail, SMS, MMS, internet/information search, calendar/reminder, video call, well-being diary, cognitive games, fall detection and actimetrics. The selected scenarios outline the functionality of the vAssist system and the interaction with the future end-users based on the information collected from end-users during the requirement phase. Moreover, the scenarios are an important supportive instrument for the technical definition of the system architecture that is done in parallel in D2.3 (System Definition).

1.2 Scope of the deliverable

The D4.1 (Evaluation and assessment plan for the lab and field trials) presents the roadmap for all evaluation processes of the vAssist prototypes within real life scenarios based on the data collection of the user requirement analysis. The deliverable defines the general procedural methods for the realization of the lab (Task 4.2) and field trials (Task 4.3) and specifies the goals, strategies, tasks and subtasks of the whole evaluation process.

Section 2 introduces the time and task plan. In Section 3 the focus of the research is presented. In Section 4 the targets user specification and recruitment procedure are defined. In Section 5 the evaluation procedures are introduced. Section 6 presents the methodology applied in the evaluation phases. Supplementary documents such as user manuals and ethical documents are listed in the appendix.

2 Time and task plan

Work package 4 includes the development of an assessment and evaluation plan for the lab and field trials (Task 4.1). There are two iterations of lab trials (Task 4.2) and one field trial (Task 4.3). For a better overview of the planned evaluation phases see Figure 1.

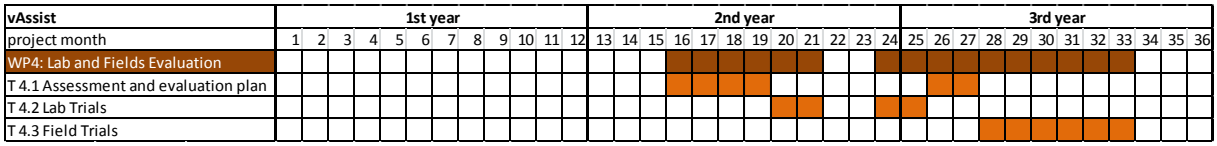


Figure 1: Time schedule of planned evaluation phases

This document D4.1 is the outcome of the activities preformed in Task 4.1. It includes the preparation, and implementation plan of the two lab trials (M16-19) as well as for the field trial (M26-M27).

After the completion of the trial activities, D4.2 (Report lab trials) will be delivered in month 25 (December 2013) and D4.3 (Report field trials) in month 33 (August 2014). Milestone 4 (end of field Trial) will be achieved by month 33 (August 2014).

The devices that will be applied in the lab evaluations are a smartphone for the first lab trial and a smartphone and a static TV set (integrated via android TV box) for the second lab trial. The first lab trial (M20-M22) will focus on the use of the first vAssist prototype by user evaluation according to the defined scenarios and use-cases in D2.4 – Scenario Definition [8]. Results of the first lab trials will be analyzed and integrated into the subsequent modification and development process of the vAssist prototype for the second lab trial (M24-M25). For the long-term evaluation of the vAssist system a field trial will be conducted lasting 6 months (M25-M33). The aim of the field trial is to evaluate the system under real world conditions regarding its relevance, impact and importance of each scenario (including weaknesses, strengths and improvements) and the acceptance of the developed service delivery models.

The lab trials will be performed in Austria (CURE, EURAG) and France (AP-HP). The field trials will take place in Austria (CURE, EURAG) and France (AP-HP) with focus on the communication services as well as in Italy (I&S) with focus on the well-being services.

3 Focus of research

The aim of the research is to gather information about the functions and acceptability of the vAssist prototype by older users and its impact on their lives. Furthermore the evaluation of perceived usefulness and usability of the offered services and functions will be of importance. For this reason, user studies will be conducted divided in different evaluation phases to ensure an exhaustive and holistic data collection about the realistic use of the vAssist system. Therefore user involvement will take place in all evaluation phases to ensure valid results for the user-centred modification and adaption processes of the vAssist prototype.

In this context, the following sections give an overview about different aspects that will be evaluated within this research.

3.1 Goals of the evaluation

Quality of Service (QoS) and Quality of Experience (QoE) of the multimodal vAssist system are considered to play an important role regarding the success of the proposed solution. Taking both measures into account allows for a technology- and user-centred approach in order to provide a good estimation of the overall acceptability of the vAssist system and its subsequent use in real life.

QoE is based on end-user behaviour and therefore serves as a subjective psychological measure of using an ICT service or product [9]. It is strongly related to the concept of user experience (UX) and provides a good estimation of the overall acceptability of an application or service, as perceived subjectively by the end-user. QoS is defined as the technical performance of a product or service and is therefore mainly technology-centred.

For this reason the two lab evaluation phases will evaluate QoE to gain insights into users' perception of the system. Due to different fidelity levels of the provided vAssist prototypes, the first lab evaluation will focus only on a limited set of QoE aspects because not all service and technical features will be available on the first prototype system. Consequently the quality of the pure interaction between the user and the system will play a minor role in the first lab evaluation. For the second lab evaluation a high-fidelity prototype will be provided so that interaction quality factors can also be taken into account besides the other QoE factors. The subsequent field trial will constitute the long-term evaluation of the vAssist system in a realistic home environment. Accordingly, the focus of the field evaluation will be on the potential impact of the vAssist system to enhance the quality of life of the respective users explored by the relevance, impact and importance of each use-case as well as the acceptance of the developed service delivery models.

3.1.1 Usability, Learnability/Intuitiveness, Appeal, Usefulness

The four factors of QoE (usability, learnability, appeal and usefulness) were selected from the taxonomy model of Wechsung et al. [29] which is based on the guidelines for quality of experience (QoE) for real-time communication services proposed by the European Telecommunications Standard Institute (ETSI) [9].

Usability: In this context usability refers not only to the terms of effectiveness, efficiency and satisfaction to reach a specific goal with the help of the technological product, but also to terms of UX regarding users' perception of hedonic aspect such as enjoyment, engagement and appeal of using and owning an ICT device, e.g. [1]. Based on this, the usability of the vAssist system will be evaluated regarding "joy of use", to fulfil the requirements of UX and "ease of use" to meet the requirement of goal achievement by using the vAssist system.

Learnability and Intuitiveness: Are defined as the ease with which novice users can start effectible interactions and maximize performance. Related to vAssist it is important to know how the users (especially older people who are often less inclined to ICT) are able to deal with the vAssist system. Therefore learnability and intuitiveness (ability to apply knowledge unconsciously) will be measured in the vAssist project.

Appeal: Also represents the hedonic aspects of a given product. Appeal refers to the aesthetics of the vAssist system and its inherent interesting, novel and surprising features. According to Tractinsky [26] aesthetic features of a product have an influence on the post-use perception of usability. For this purpose the appeal or the "personality" of the vAssist system will be evaluated.

Usefulness: is perceived when functional requirements of the user are satisfied by the functions offered by the system. In this context, perceived usefulness is also related to utility and usability in terms of if and how well the vAssist system can help the user.

3.1.2 Interaction quality of the multimodal application

As vAssist provides assistive care and communication services with multimodal (speech, touch) in- and output options, the interaction between the system and the user is of great importance. For this reason the perceived interaction quality by the user will be evaluated considering the input quality, output quality and the cooperativity of the vAssist system.

3.2 Research Questions

Generally the following questions are of interest, separated by evaluation phase and functional level of the vAssist system:

First lab trial – low-fi prototype

i. To what degree is the usability of the vAssist system satisfying for the primary users?
ii. To what degree are users able to use the vAssist system effortless and in an intuitive way?
iii. In how far are aesthetic features of vAssist perceived by the user and to what degree do they have influence on the usability of the vAssist system?
iv. To what degree is the vAssist system perceived as useful by the users?

Second lab trial – high-fi prototype

v. How satisfied are the users with the interaction quality of the vAssist system?

vi. In how far does the interaction quality between the user and the vAssist system influence the usability and user experience?

Field trials – full integrated prototype

vii. How satisfied are the users with the offered services of the vAssist system?

viii. To what degree does the vAssist system enhance the quality of life of the users?

4 Target user specification and recruitment

The lab trials will take place in Austria and France; field trials in Austria, France and Italy. Each trial site will invite primary and secondary users. The vAssist project aims at two target groups of primary users to achieve inclusion-for-all. Persons who fulfil the following inclusion criteria are able to participate in the study:

a. Older users in their home and while outside with restricted (fine) motor skills that lead to problems in the use of mouse and keyboard or touch/mobile devices. People are aged 65 and older suffering from different limitations at the upper limb.

b. Older users in home care suffering from chronic diseases. A focus is given on COPD patients (Chronic Obstructive Pulmonary Disease) in stationary and home care. These users are 65 years or older, have minor problems with memory or vision but might have motor and mnemonic problems.

The following sections provide a detailed description and overview of the target group.

4.1 Target User Groups

4.1.1 Primary users

Primary users are defined as:

- Older adults with (fine-) motor skill impairments
- And/or chronic diseases

Primary users in vAssist are defined as persons aged 65 and older (both male and female). These persons may show restrictions in their vision, eyesight and / or hearing, as well as AAMI (Age Associated Memory Impairment). The main characteristics are summarized below (see also Table 1):

- **Age:** 65 and older
- **Sex:** male/female
- **Restriction sensual:** showing age related restrictions in their vision, and/or hearing (but not suffering from specific impairments such as blindness or deafness).
- **Restriction cognitive:** Persons may show age related problems with their memory skills, defined as AAMI (Age Associated Memory Impairment), but are not diagnosed with neurodegenerative diseases such as MCI (Mild Cognitive Impairment), Alzheimer`s Disease, Dementia, or similar. Persons with a diagnosed cognitive impairment are not in the focus of vAssist.
- **Experience with ICT:** Having at least little experience with the use of modern ICT Information and Telecommunication Technologies (ICT) such as PCs, laptops, internet, TVs and/or mobile phones.

Diverse combinations of the following additional characteristics are in the focus of vAssist:

- **Restriction physical:** Persons with restrictions in their (fine-) motor skills that lead to problems in the use of mouse and keyboard or touch and/or mobile devices. They may also suffer from different limitations at the upper limb that hinder them in using technical devices.
- **Chronic conditions:** Persons suffering from a chronic disease (e.g. diabetes, rheumatism, arthritis, high blood pressure, cardiovascular diseases, etc.). These persons also may receive stationary medical care or supportive home care services.

Table 1 illustrates the main characteristics of the primary target user group of vAssist, summarizing male and female characteristics.

Table 1: Summary of main characteristics of the primary target user group f vAssist (male and female)

Main Characteristics of Primary Users	
Gender	male / female
Age	65+
Social contacts	none to some
Limitations / Difficulties in	*at least two of the following:* bathing, climbing stairs, crouching, kneeling, stooping, difficulties in shopping groceries, doing house work, getting up from chair or bed, lifting or carrying weights over five kilos, pulling and pushing large objects
Diseases	*at least one of the following:* cataract cholesterol diabetes heart attack high blood pressure osteoporosis
Symptoms	heart trouble pain in joints, back, knees
Devices in use	*at least one of the following:* Smart phone Tablet TV

The following two CURE-elderly-Personas (one male, one female) have been chosen since they describe the vAssist primary target user group best (see Table 1).

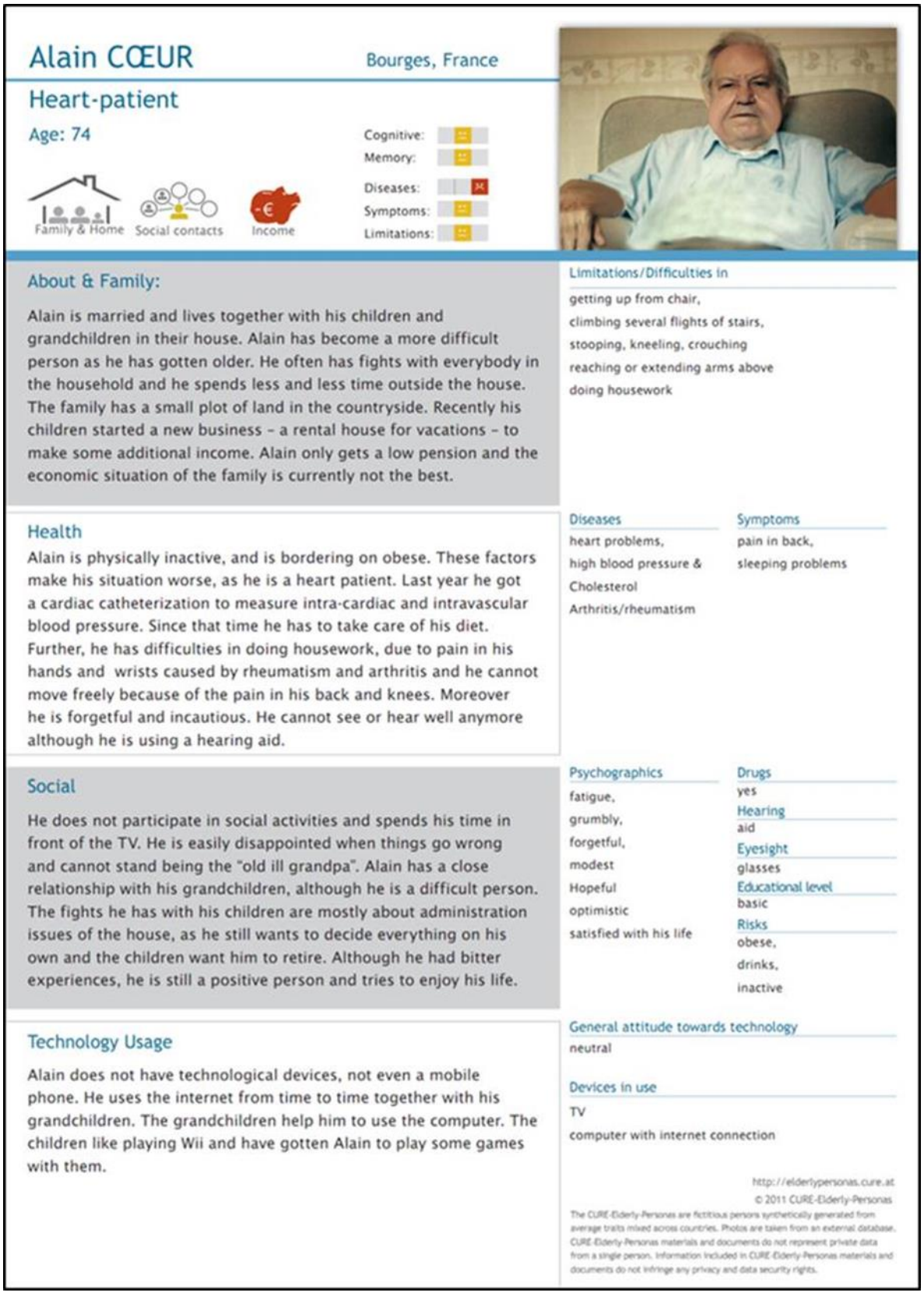
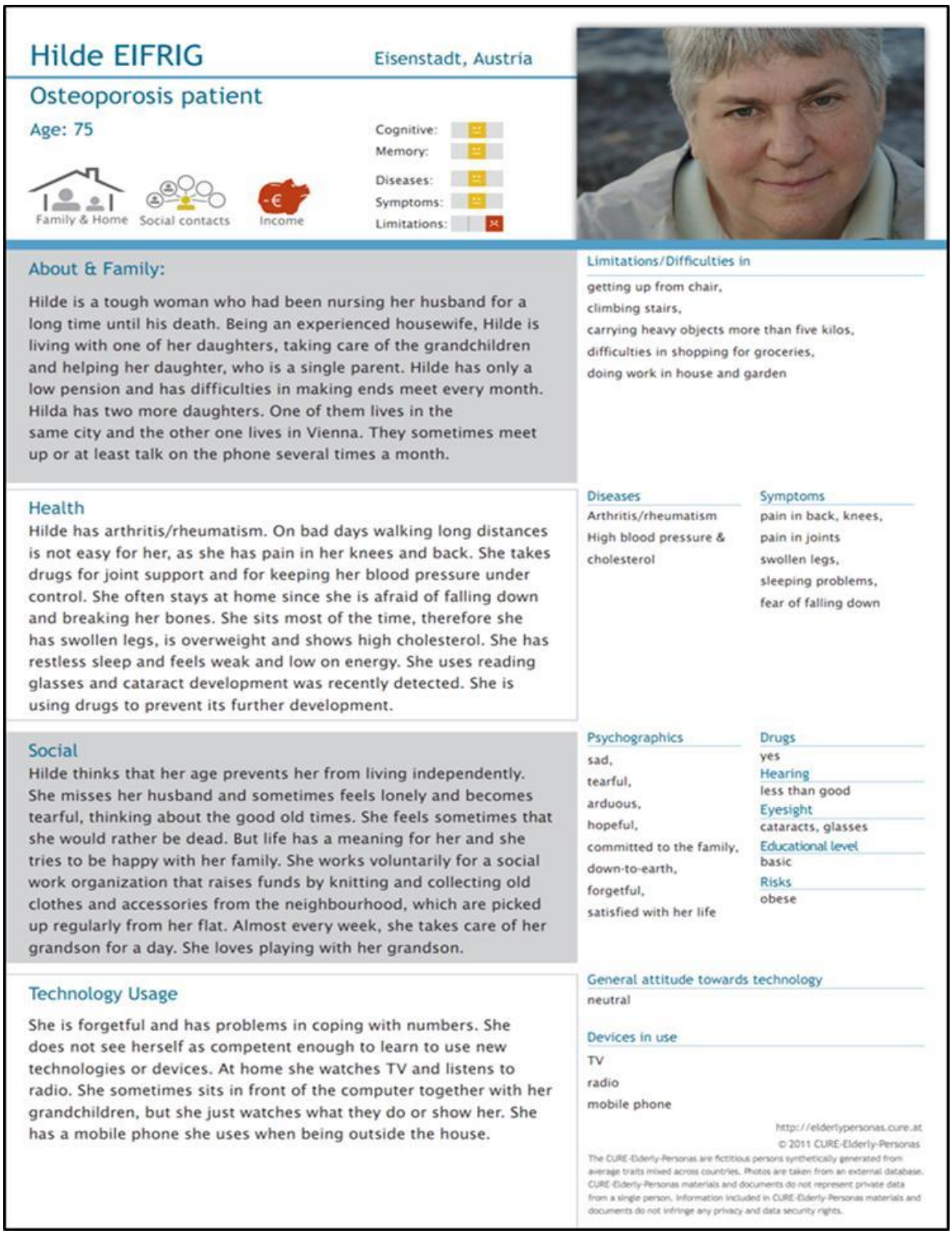


Figure 2: CURE-Elderly-Persona describing male primary users of the vAssist project



Hilde EIFRIG

Eisenstadt, Austria

Osteoporosis patient

Age: 75

Cognitive:
Memory:
Diseases:
Symptoms:
Limitations:

Family & Home
Social contacts
Income

About & Family:

Hilde is a tough woman who had been nursing her husband for a long time until his death. Being an experienced housewife, Hilde is living with one of her daughters, taking care of the grandchildren and helping her daughter, who is a single parent. Hilde has only a low pension and has difficulties in making ends meet every month. Hilda has two more daughters. One of them lives in the same city and the other one lives in Vienna. They sometimes meet up or at least talk on the phone several times a month.

Limitations/Difficulties in

getting up from chair,
climbing stairs,
carrying heavy objects more than five kilos,
difficulties in shopping for groceries,
doing work in house and garden

Health

Hilde has arthritis/rheumatism. On bad days walking long distances is not easy for her, as she has pain in her knees and back. She takes drugs for joint support and for keeping her blood pressure under control. She often stays at home since she is afraid of falling down and breaking her bones. She sits most of the time, therefore she has swollen legs, is overweight and shows high cholesterol. She has restless sleep and feels weak and low on energy. She uses reading glasses and cataract development was recently detected. She is using drugs to prevent its further development.

Diseases

Arthritis/rheumatism
High blood pressure & cholesterol

Symptoms

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

Social

Hilde thinks 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. She feels sometimes that she would rather be dead. But life has a meaning for her and she tries to be happy with her family. She 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. Almost every week, she takes care of her grandson for a day. She loves playing with her grandson.

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

Educational level

basic

Risks

obese

Technology Usage

She is forgetful and has problems in coping 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 radio. She sometimes sits in front of the computer together with her grandchildren, but she just watches what they do or show her. She has a mobile phone she uses when being outside the house.

General attitude towards technology

neutral

Devices in use

TV
radio
mobile phone

http://elderlypersonas.cure.at

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The CURE-Elderly-Personas are fictitious persons synthetically generated from average traits mixed across countries. Photos are taken from an external database. CURE-Elderly-Personas materials and documents do not represent private data from a single person. Information included in CURE-Elderly-Personas materials and documents do not infringe any privacy and data security rights.

Figure 3: Hilde Eifrig: CURE-Elderly-Persona describing female primary users of the vAssist project

4.1.2 Secondary users

This section defines the profile of the secondary users in vAssist.

Secondary users are divided into formal and informal caregivers:

- *Formal caregivers:* health professionals, medical personnel, nurses
- *Informal caregivers:* family members, relatives, friends

4.1.2.1 Formal Caregivers

Health Professionals in vAssist are defined as persons with a specific (academic) medical education that get paid for their work and efforts.

These persons can be general practioners, but also specialists such as neurologists, psychologists, gerontologists, nurses, nutrition or diet coaches or other medical personnel whose focus is on treating seniors who show restrictions in their (fine-) motor skills and/or suffer from chronic diseases. In general these persons supply diverse supportive (home) care and/or medical care services to senior citizens.

Formal caregivers (health professionals, medical personnel, nurses, physicians, etc.) selected by the following criteria:

- **Age:** 20 and older
- **Sex:** male/female
- **Education:** specific (academic) medical education
- **Work/Experience:** supplying diverse supportive (home) care and/or medical care services to older persons with (fine-) motor skill restrictions and/or chronic diseases. Get paid for their work and efforts.

The following general minimum criteria apply for the formal caregivers (see Table 2).

Table 2: Summary of the main characteristics of formal caregivers (male and female) of the vAssist project

Main Characteristics of Formal Caregivers	
Gender	male / female
Age	20+
Work Experience	*Treating seniors with:* Age Associated Memory Impairment (AAMI) Chronic diseases Restriction in (fine) motor skills
Technology Experience	*at least once a week use of:* Computer with Internet connection E-mail Mobile phone Technical medical devices

4.1.2.2 Informal Caregivers

Informal caregivers in vAssist are defined as family members, relatives and/or friends that voluntarily take care of older people without any employment contract or payment. The supportive services provided from this group ranges (but not limited to this) from grocery shopping, making the household, helping with sanitary care (if necessary) and being a social companion.

Informal caregivers are defined as persons:

- **Age:** 20 and older
- **Sex:** male/female
- **Education:** No specific education related to medical and or health care of older persons
- **Work/Experience:** Providing voluntarily care support to senior family members and/or relatives. No contracts or payments.

The following general minimum criteria apply for the informal caregivers (see Table 3).

Table 3: Summary of the main characteristics of informal caregivers (male and female) of the vAssist project

Main Characteristics of Informal Caregivers	
Gender	male / female
Age	20+
Work Experience	*supporting seniors with:* cooking grocery shopping helping with sanitary care making the household social interaction
Technology Experience	*at least once a week use of:* Computer with Internet connection E-mail Mobile phone

4.1.3 Tertiary users

Tertiary users are defined as service providers (see D2.2 Service Providers and Business Requirements [6]) offering technical services like telecommunications, tele-medicine, e-health and e-inclusion as well as social and medical services such as social support institutions, homecare services, national health care systems and public and private hospitals.

4.2 Recruitment procedure

The user specifications described above serves as a guideline for the recruitments of the participants.

4.2.1 Recruitment procedure for the lab trials

In Austria CURE and EURAG, in France AP-HP and in Italy I&S will be responsible for the recruitment of the participants for the vAssist lab trials. The number and inclusion criteria of participants for the first and second lab trial for each trial site are planned to be:

Table 4: Number and inclusion criteria of participants for the first lab trials

First lab trial		
	Austria	**France**
Primary users	10	10
Inclusion criteria	a) Restrictions of (fine) motor skills that could lead to problems with the upper limbs	b) Suffering from chronic diseases like COPD or have minor problems with memory or vision but might have motor and mnemonic problems.
Age	65+	65+
Research Focus on	Communication services	Tele-medicine services

Table 5: Number and inclusion criteria of participants for the second lab trials

Second lab trial		
	Austria	**France**
Primary users	10	10
Inclusion criteria	a) Restrictions of (fine) motor skills that could lead to problems with the upper limbs	b) Suffering from chronic diseases like COPD or have minor problems with memory or vision but might have motor and mnemonic problems.
Age	65+	65+
Research Focus on	communication services	tele-medicine services

4.2.2 Recruitment procedure for the field trials

AIT in Austria supported by EURAG, AP-HP in France and I&S in Italy will be responsible for the recruitment of the participants. Austrian and French user trials will focus mainly on communication and tele-medical services. Italy will mainly focus on the DailyCom application and the business model evaluation. Before starting the field trials the vAssist system will be introduced within demonstration sessions to all participants. The aim of these demonstration sessions is to ensure that the participants are able to handle the system properly. The duration of the field trials will be 15 weeks in sum. At each trial site at least 15 end-users will be involved.

The evaluation will emphasize on the following points:

A) System and User Evaluation: This part evaluates the system against the use cases defined in WP 2. The vAssist system is evaluated and assessed in real world environments showing relevance, impact and importance of each scenario (including weaknesses, strengths and improvements) as well as QoE factors.

B) Business Model Evaluation: Further, the acceptance of the developed service delivery models is evaluated.

Table 6 shows the inclusion criteria and research focus for each trial site:

Table 6: Number and inclusion criteria of participants for the field trials

Field trial			
	Austria	**France**	**Italy**
Primary users	>15	>15	10
Secondary users	/	/	5
Inclusion criteria	Restrictions of (fine) motor skills that could lead to problems with the upper limbs	Suffering from chronic diseases like High Blood Pressure, diabetes, or arthritis. Minor cognitive impairments could be included.	Older patients suffering by difficulties respiratory (COPD) and fine motor restriction.
Age	65+	65+	65+
Research Focus on	communication services and tele-medicine services (PillBox and DailyCare)	communication services and tele-medicine services (PillBox, DailyCare, ambulatory terminal)	DailyCom application, communication services, DailyCare services and business model

5 Procedure

CURE, AIT and EURAG in Austria and AP-HP in France will carry out the user studies. The results of the user requirement analysis will serve as a guideline to develop and select test scenarios for the lab evaluations.

Single **lab trials** with end-users will be conducted with the focus on QoS and QoE of the developed vAssist hard- and software components. There are 2 iterative evaluation/development phases. After each lab trial feedback is provided to the development partners.

In both iterations of lab trials in Austria and France 20 primary users will be involved (10 on communication services; 10 on tele-medicine services). Austria will focus on communication services and France on tele-medicine services.

Results from lab trials and interviews are analysed and constitute the base for the further service and business model development that will be implemented for the field trial phase.

Field trials will take place in France, Austria and Italy. All participants will have access to all vAssist services. French user trials will focus mainly on tele-medical services, since AP-HP has access to users with chronic diseases. Field trials in Austria and Italy will mainly focus on telecommunication services. Before the start of the field trials the vAssist system will be introduced to all participants and will be demonstrated to ensure that they are able to handle the system. The duration of the field trials will be 6 months. At each trial site 20 end-users will be involved.

5.1 Procedure lab trials

In Austria and France representatives of the defined target group who fulfil the inclusion criteria for participation will be invited to the lab trials. Invited users will evaluate under standardized lab conditions the use of the first vAssist prototype. For this purpose, observations, quantitative measurements and interviews will be applied to gain realistic user experience data that will be integrated into the subsequent modification and development process of the vAssist system.

The evaluation process encompasses three main stages:

- Pre-interview
- Prototype evaluation on the basis of selected test scenarios followed by post scenario questionnaires
- Post-interview and post study questionnaires

The beginning of the trial constitutes a detailed introduction from the facilitator who will explain the vAssist system and the functions it offers to the participants as well as the purpose of the user evaluation. Additionally the facilitator will hand out to each participant a consent form for informed consent according to the ethical guidelines defined in D1.2 (Ethical Guidelines) [1]. The informed consent ensures that the participant gets fully informed about the research study and that he/she will agree based on the provided information. Participation is only possible if the informed consent is read and signed

by the invited users. In Austria participants will receive an allowance after the study from the facilitator. In France an allowance will not be provided for the participants.

Results from lab trials and interviews are analyzed and constitute the base for the further service and business model development that will be implemented for the field trial phase.

5.2 Procedures Field Trial

The field trial in Austria is organized and hosted by AIT. The Austrian based user organization EURAG will support AIT in this activity by providing access to users and user-related know-how. The field trial in Italy will be organized and hosted by I&S in collaboration with ASL4 of Prato. APHP acts as user organization and provides access to patients of daily care hospital (without major cognitive impairment). AIT is supporting the partners in terms of organizational support.

The field trials start with a workshop where the system and the evaluation plan will be introduced and participants are trained to be able to use the tested services on their own. An informed consent will be handed out to ensure that the participants are fully informed about the project and the field trial. In Austria participants will receive an allowance after completing the study from the facilitator. In France an allowance will not be provided for the participants. During the field trial, several quantitative and qualitative data generation will take place. At the end, participants will receive a debriefing.

Table 7 gives an overview of the time plan for the trials in Austria, France and Italy.[1]

Table 7: Overview time plan

Month:		**November**			**December**				**January**					**February**		
Calendar week:		46	47	48	49	50	51	52	1	2	3	4	5	6	7	8
Trial Site																
Austria	Group 1:															
	Group 2:															
	Group 3:															
France																
Italy																

A handbook describing the tasks to perform will be handed out to the participants on a monthly basis. The handbook will also include questionnaires and diaries to fill in and a manual for the vAssist system. A local telephone helpline for questions regarding the system, tasks, and the study design will be set up. If technical problems occur, the helpline acts as intermediary.

In Italy, both the primary and secondary users have consistently used the system from November 2014, the start date of the field trial.

[1] Because of update of the work plan for the extension of the project this time plan is not fully in line with the initial road map for the vAssist trial activities (as outlined in section 1)

6 Methodology

The methodology to evaluate the success and the applicability, as well as the impact on the users, is a mixture of qualitative and quantitative measures (method-mix). In order to get adequate feedback and data material, we utilize research methods that involve the user face to face (e.g. post-study interviews) as well as research methods that gather feedback from non-verbal feedback (directly after interaction with the system).

Qualitative and quantitative data will be gathered throughout all phases of the lab and field evaluation, consequently before, during and after the system interaction.

Qualitative data will be collected through face-to face interviews, observations and thinking-aloud procedures. The interviews will be split into two parts, pre-interview before system interaction and post-interview after system interaction. The pre-interview serves as warm up phase. For that propose, questions which are easy to answer, e.g. regarding the experience level with modern technologies, will be asked. The post-interview targets in particular subjective judgements about the system interaction and which positive and negative aspects were associated with the vAssist system. Furthermore, business models will be integrated in the post-interview by asking the user how he/she expects the disposal, accessibility, costs and distribution of the vAssist system.

The other part of the qualitative data will be collected during the system interaction. The facilitator will instruct the user to “think aloud” when he/she is operating with the vAssist system. This thinking-aloud method serves as a tool to get access to triggered thoughts and subjective impressions during system interaction. Based on this method, the facilitator will notice all relevant utterances from the user as well as noteworthy observations regarding occurring difficulties and problems while using the vAssist system.

Quantitative data will be measured also during and after system interaction. The user will get a set of standardized questionnaires after each scenario and after the whole evaluation process. The questionnaires will target perceived quality of experience (QoE) and quality of service (QoS) during system interaction. For the user evaluation specific interaction factors will be taken into account. These factors are taken from the three-layered taxonomy model from Wechsung et al. [29]. The authors propose a novel approach for measuring quality of service (QoS) and quality of experience (QoE) for assessing the relationship between single system factors and user perception regarding the fulfilment of expectation and needs. QoS is based on technical performance, what application or features are provided through that system, and QoE is based on end-user behaviour (user-centred - how does the user perceive the interaction with that system) [9]. Through this they aim to enhance the decision-making authority which one or more technical QoS parameters need to be changed in order to achieve higher QoE. The quantitative data will also be used to draw comparisons between the different user groups (e.g. primary and secondary users).

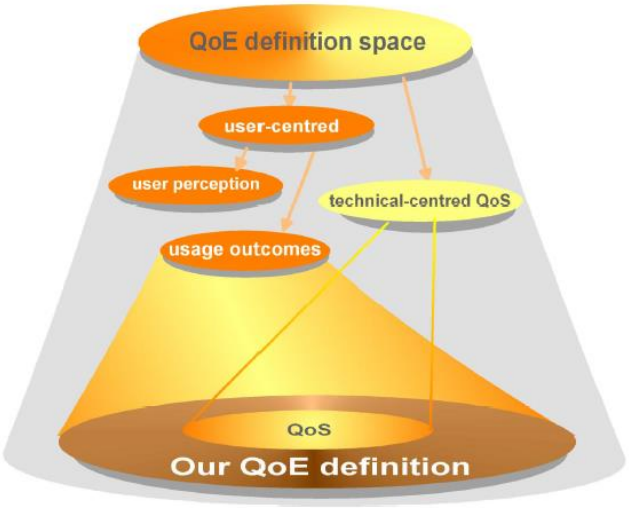


Figure 4: The relation between QoE and QoS approaches

Quality factors have an influence on QoE through the interaction performance aspects. They include the characteristics of the user, the system and the context of use which have an influence on perceived quality [15].

QoE is directly linked to the concept of User Experience (UX) including enjoyment, appeal and engagement while interacting with the multimodal system. Factors of UX when using a technology are relevant to that effect that ICT application has extended from working place to domestic environments and/or support leisure time and social activities.

In the past, the usability of ICT was more important considering to what extend a product can help someone reaching ones goals with effectiveness, efficiency and satisfaction [9]. Today, the focus has been shifted from former parameters of effectiveness and efficiency to enjoyment, engagement and appeal of using and owning ICT [9].

Regarding this it is more important to consider user-centred development of telecommunication services, such as vAssist. Enabling stakeholder to make decisions about how to enhance the perceived QoE, technical conditions of a communication service must be stated together with the QoE measures [9]. Therefore QoE combines user-based measures (e.g. user experience) with technical measures (e.g. QoS) [9] (see Figure 4).

6.1 First Lab Evaluation

The focus of the first lab evaluation of the vAssist system by end-users will be on the functions of the different applications available in the first low-fi prototype. The participants will be confronted with different test scenarios based on the results of the user requirement analysis. The examination with the system and completion of these scenarios will provide insights into interaction behaviour of the respective user group and the appropriateness of the graphical user interface as well as the hard- and software features.

To meet the requirements of holistic evaluation quantitative and qualitative measures will be provided during and after the user study evaluating different aspects of QoE and perceived system factors.

Due to the fact that in the first lab trial technical service factors of the vAssist low-fi prototype will not be fully developed QoE factors will be prioritized. Parameters of interest that will be measured in the first lab trial are taken from the taxonomy model of Wechsung et al. [29]. These parameters are as follows: usability, learnability and intuitivity, appeal and usefulness of the system.

Usability: In this context usability will be considered in terms of two aspects. First the “ease of use” and secondly „joy of use” in order to determine the satisfaction of the user as a consequence of good usability will be measured. For measuring usability the AttrakDiff from [12] will be applied. The AttrakDiff’s “attractiveness” scale, measuring pragmatic (Ease of Use) as well as hedonic qualities (Joy of Use) is considered to match the conception of usability offered by the taxonomy model [29].

Learnability and intuitivity: refers to the ease with which novice user are able to conduct effective interaction with the system and maximize performance. A good measure for learnability is offered by the Software-Usability-Scale (SUS, [3]). Additionally the degree of intuitivity will be integrated into QoE to gain insights in how far users are able to apply previous knowledge unconsciously in order to interact effectively and efficiently with the system. The questionnaire INTUI [27] will be applied to measure the intuitivity of the vAssist system.

Appeal: The appeal of the vAssist system will also be in the focus of the evaluation process. Based on the assumption that aesthetic features of a given system such as “interesting”, “novel” and “surprising” also play an important role in the way how the system is perceived by the user. These aspects are not only related to observable physical features but also to hedonic and affective qualities that come along with the use of the system and might have a crucial influence on future usage and appreciation. The AttrakDiff questionnaire [12] also offers a good estimation of the perceived attractiveness of a product besides the hedonic quality aspects. Therefore the AttrakDiff covers both the pragmatic and hedonic evaluation of a product in one data collection.

Usefulness: Is given when functions offered by the system meet the functional requirements of the user. The perceived usefulness is partially associated to the aspects of utility and usability of a system and therefore gives a good impression of how well a user is able to complete given task with the help of the system, considering the effort spent in the interaction and the experiences joy in the meantime. The Post-Study System Usability Questionnaire (PSSUQ) [22] will be applied to measure the perceived usefulness.

In addition the interaction quality will also play an important role concerning QoE factors. To overcome the issue that for the first low-fi vAssist prototype the speech interaction will not be fully integrated the Wizard of Oz [18] technique will be applied to generate natural speech output for the user when using the speech input modality. Relevant utterances of the user will “secretly” be entered into the computer by a second facilitator (the wizard) in a separate room. The entered text will be processed and synthetized as voice output to the user who gets the impression that he or she is really communicating with the vAssist system using a speech interface. The goal of the WoZ setting is to observe the usage and effectiveness of the proposed vAssist voice-user- interface (VUI) by the participants.

6.2 Second Lab Evaluation

The outcome of the lab evaluation will be directly integrated into the subsequent development and modification process of the vAssist system. As a result the vAssist prototype will achieve a higher fidelity level including technically well-engineered features. In this context different input and output modalities of the vAssist system will be available such as voice, text and touch input as well as the combination of them for system interaction. Taking this into account the service factors of the vAssist system will also be in focus of the user evaluation. Referring to the taxonomy model [15] relevant factors will be measured and analysed.

Based on this the interaction quality of the multimodal vAssist system as well as different system factors will be evaluated additionally to the aspects of the first lab evaluation. In order to investigate how the interaction of the different input modalities (voice, text, touch) is perceived by the users, three aspects of system interaction quality will be taken into consideration: Input quality, output quality and cooperativeness. Interaction quality belongs to the QoE factors and has an influence on among others usability, appeal, learnability and intuitivity. Through this, the quality of interaction between user and system is accessed in a more profound way.

Input quality: Refers to the estimation of the user how he/she is understood by the system. It is related to the perceived system understanding and input comfort that goes beyond the traditional input performance.

Output quality: Refers to the perceived system understandability by the user and its appropriateness. This means, how well the user understands the information provided by the system, e.g. meaning and content of the systems' message which also depends on the systems' output performance such as legibility of output and intelligibility of synthesized speech.

Cooperativity: Targets on the cooperativeness between the two operators, system and user. This means in how far the system supports the user to reach a joint goal via the systems output messages. Furthermore, cooperativeness also includes the initiative of interaction either from the user or the system and the use of background knowledge of both operators in order to clarify or repair interaction content.

Interaction quality will be measured by applying the Subjective Assessment of Speech System Interfaces (SASSI) questionnaire [13], which evaluated the users' subjective experiences with speech recognition systems.

6.3 Field Trials

During the field trial, data regarding the Quality of Service (QoS) and the Quality of Experience (QoE) according to Wechsung [29] will be gathered to explore the QoS and QoE aspects in detail and real life conditions. Figure 5 gives an overview on the concrete factors which will be investigated in the context of the field trial.

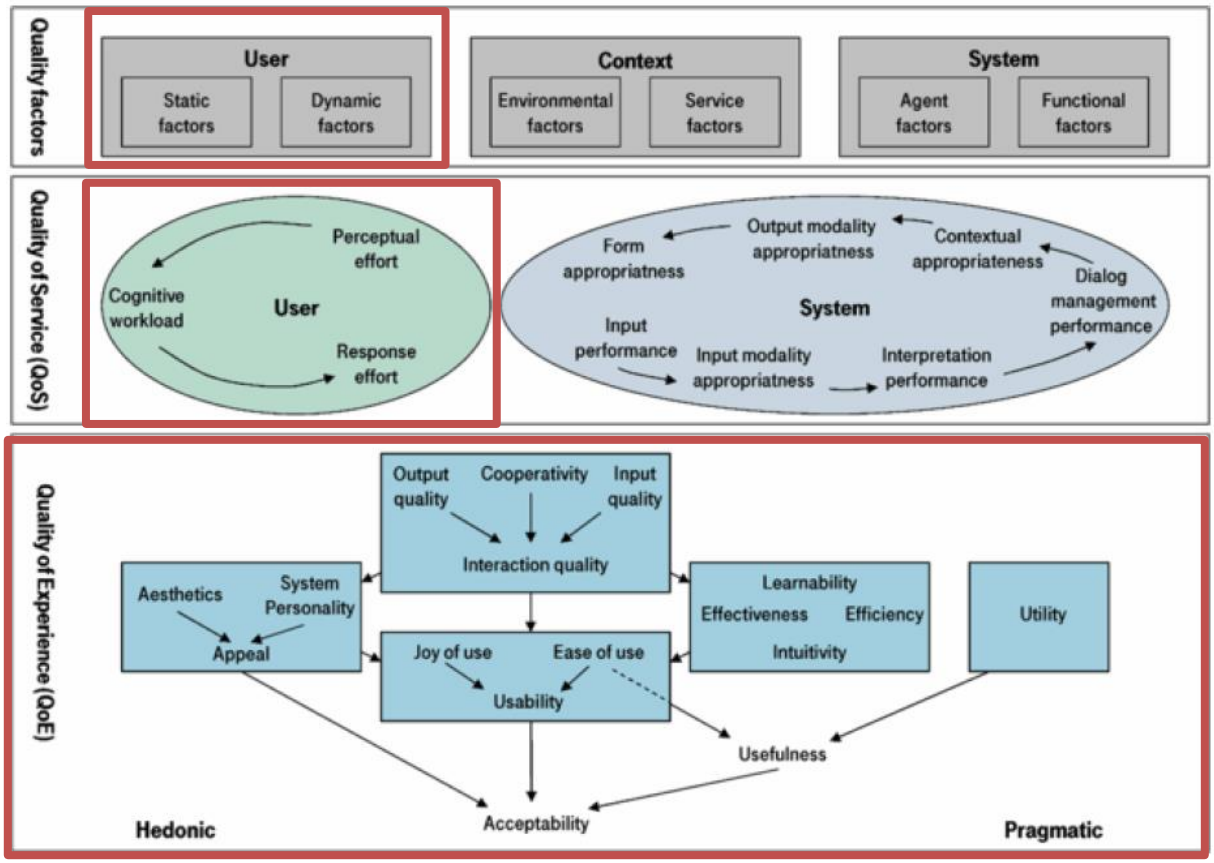


Figure 5: Taxonomy of QoS and QoE aspects of multimodal human–machine interaction [29] and focus of the field trial

To operationalize these aspects qualitative and quantitative methods will be applied. On a quantitative level, the factors will be addressed with the following questionnaires:

Table 8: Factors and metrics

Quality factors	
User factors	
perceptional characteristics	visual and auditory impairments
behavioral characteristics	accented vs. non-accented speech, native speaker, left-/right-handed
experience	technology experience, experience with speech interaction, experience with "similar" systems, usual habits and support with medication intake and well-being monitoring

motivation (for using the system)	anticipation of acceptance
other	Socio-demographics, doctor's appointment frequency, privacy concerns
QoS	
User interaction performance aspects	
perceptual effort	
cognitive workload	NASA-TLX [11]
physical response effort	
QoE	
Interaction quality	
perceived input quality	SASSI [13]
perceived output quality	
system's cooperativity	
Usability	
Ease of Use	UEQ [21]
Joy of Use	
Ease of use	
efficiency	SASSI [13], UEQ [21]
effectiveness	
learnability	
intuitivity	
Joy of use	
aesthetic	UEQ [21], SAM [2]
system's personality	
appeal	
Utility and usefulness	
utility	UEQ [21]
usefulness	
Acceptability	
Acceptability	TAM3 [28]
Quality of Life	
Quality of life	WHOQOL-BREF [25]

Table 9 shows survey period per questionnaire and the qualitative methods during the field trial.

Table 9: Time plan and methods

Questionnaires/ Methods	Workshop	Week of the field trial							
		1	2	3	4	5	6	7	8
User factors	x								
Task: Telephone call		x	x	x	x	x	x	x	x
SAM		x	x	x	x	x	x	x	x
TAM3	x								x
UEQ			x				x		
SASSI				x				x	
NASA-TLX			x				x		
WHOQOL	x								x
Business model and economic aspects									x

This time plan was followed in Austria and in France. In order not to overwhelm the Italian participants belonging to the primary user group, the questionnaires were reduced. Just short forms of the UEQ [21], SASSI [13] and TAM3 [28] were used. To quantify the feedback of the secondary users, they had to complete UEQ and the SASSI.

To enhance the quantitative data and to get a deeper understanding, also qualitative methods will be applied. In detail, the diaries following the Critical Incidents Technique and the Day Reconstruction Method and interviews will serve as data gathering methods.

With the Critical Incidents Technique [10] the users are asked to report specific events related to the vAssist system, either positive or negative, and describe them in detail. Critical incidents are defined as follows:

> "By an incident is meant any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act. To be critical, an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects." [10]

This method allows getting a deeper understanding of what is important and surprising, i.e. what he or she expects the system to do or be. Because older adults could have some mild cognitive impairments and this method is sensitive to memory issues, the participants will be equipped with a diary, which s/he fills out whenever a critical incident happens. Nevertheless, participants are encouraged to report at least three incidents within two weeks. In addition, minimal intrusive reminders ensure that they do not forget to report them.

With the Day Reconstruction Method (DRM) [17] the usage of the system and its rating are captured. In detail, users have complete a "guided" reporting of all activities and events related to the system. They are instructed to fill in the printed form on a basis of an artificial week to avoid an overload of questionnaires and to ensure a variety of reported data. Hence, in the first week, they conduct the

DRM on a Monday, in the second week on a Tuesday, in the third week on a Wednesday, and so on. After listing all of their activities and events, the participants are asked to fill in the Self-Assessment Manikin (SAM) [2] to give a deeper understanding of their experience and to cover the affective assessment on a non-verbal scale. In addition, they are free to add free text comments. This method enables a faster analysis of the usage behaviour of the participants. In addition, combined with log data, the reports show what the users think they are doing and the kind of understanding of the system they have or, using the words of a constructivist, which kind of usage reality they construct.

Every week, participants are asked to use the vAssist communication service and to call a defined contact person. In the course of this call, the participants are asked in an informal way how they are, if they like the study and the system etc. To ensure an ethical adequate research strategy, participants are asked if the contact person is allowed to note the given information and to use it for the analysis.

Every week semi-structured telephone interviews are conducted. At the end of the field trial, a problem-centred Interview (PCI) with the focus on the experience during the field trial will take place. The PCI has an open narrative phase and a semi-structured phase combining the advantages of both methods and minimizing their limits [23].

7 Service prototypes

The following chapter describes the service prototypes used in the different phases of the vAssist lab and field evaluations. The lab and field evaluations will be based on the scenario definition described in D2.4. For the proof of concept we focused on several scenarios in order to minimize the workload for the participants during the lab trials. We decided to postpone the communication service scenarios as the innovation potential of those services is less pronounced. In contrast, the prototype development focused on the medication calendar and reminder (Scenario 12-14), the daily care scenario, which includes keeping and sending a diary of care data such as physical parameters or sleep and pain quality measurements (Scenario 17-18), the fall detection/ actimetrics (Scenario 20-21) and the fitness data such as diet and exercise data which can be entered and sent to secondary users (Scenario 22).

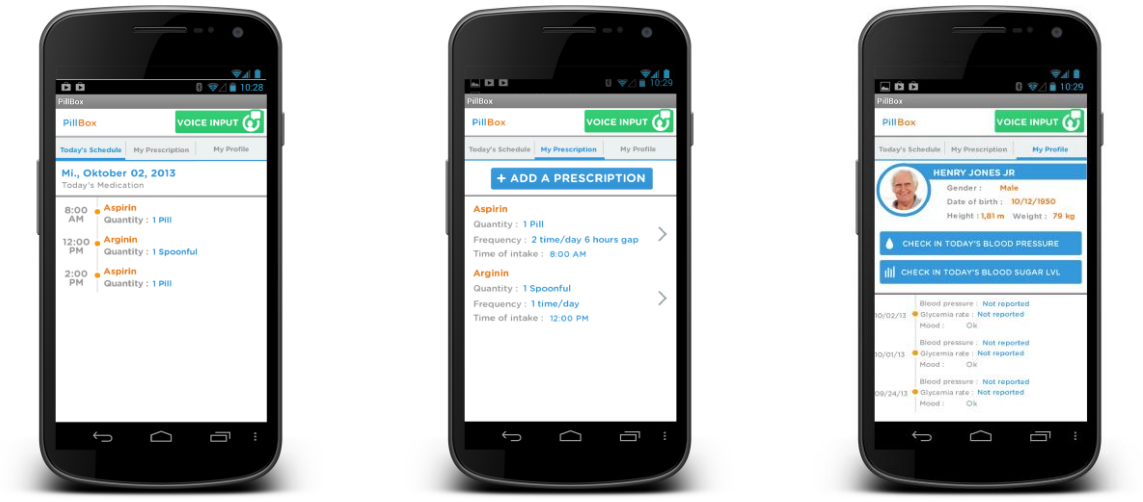
7.1 First lab trial

The first lab trial will be performed based on two mobile well-being service prototypes.

Well-being services will be available with an own graphical user interface (GUI). In addition, the user has the option to use the well-being services via voice control if he/she prefers it. In the following a short description of the two exemplary services for the first prototype development is provided which are used to prove the functionality of the vAssist user interface layer.

PillBox

Based on D2.4 – Scenario Definition [8] the PillBox application was defined to support the users with their daily medicine intake management in order to help them not to forget the timely intake or to mix up the dose of different pills. The PillBox app can be accessed directly from the start screen by tapping on the respective icon. With this application the user is able to monitor all his prescriptions and its individual intake time as well as the amount of pills at one glance. Moreover the user can easily add new prescription, create reports about occurring side effects certain medicaments. Figure 6 below shows an example of the graphical user-interface (GUI) of the low-fi vAssist PillBox application.



a) Today's Schedule b) My Prescriptions c) My Profile

Figure 6: Screenshots PillBox App

DailyCare Application

The DailyCare application bases on the requirement of a health status monitoring function provided by the vAssist system. The user can enter data like physiological parameters, pain and sleep quality as well as conducted physical activities of the day and the week. vAssist creates automatically a graphical overview of all periodic changing numerical data that can be set to a weekly, monthly and 3 month overview period.

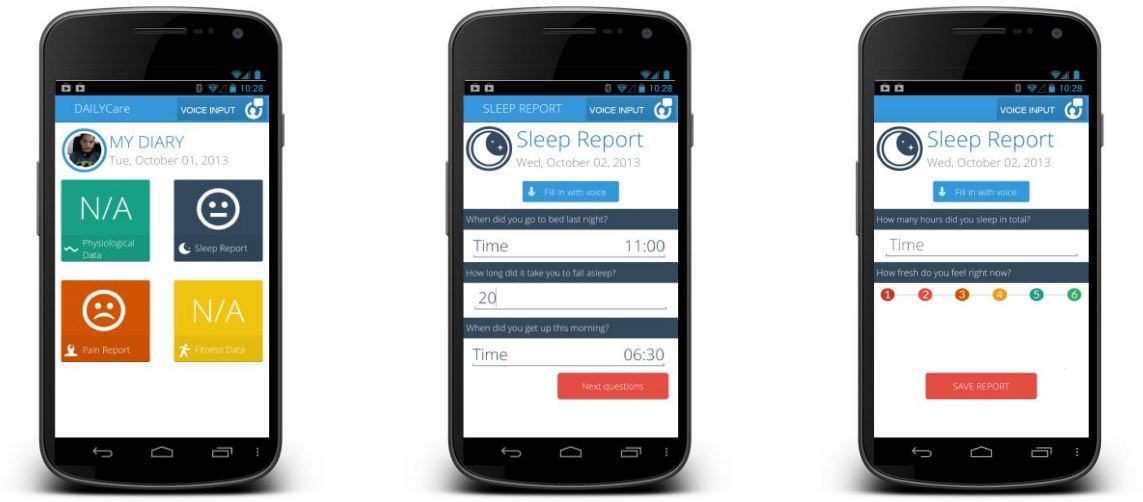


Figure 7: Screenshot examples of the DailyCare App

7.2 Second Lab Trial

The services that will be evaluated within the second lab trial are related to the defined reminder, well-being and communication scenarios (i.e. audio call, E-Mail, short messages). These scenarios are

implemented by the PillBox app (reminder), the DailyCare app (well-being), and additional communication services available via the vAssist DailyCom app. The results of the first lab trial serve as a basis for subsequent changes in the functionality of vAssist and how the services will be presented to the user.

7.2.1 Well-Being Services

PillBox app

The PillBox app can be accessed directly from the start screen by tapping on the respective icon or via the DailyCom app. With this application the user is able to monitor her prescriptions and her individual intake time. Moreover, the user can easily add new prescriptions, set reminders and create reports about the incidence of side effects of certain medications, which she could consequently send to her doctor. See below for a more detailed description of the PillBox app.

When opening the PillBox app, the user is first prompted to rate her well-being on the relevant day. Next, the user sees a schedule of the medication she has to take on that specific day.

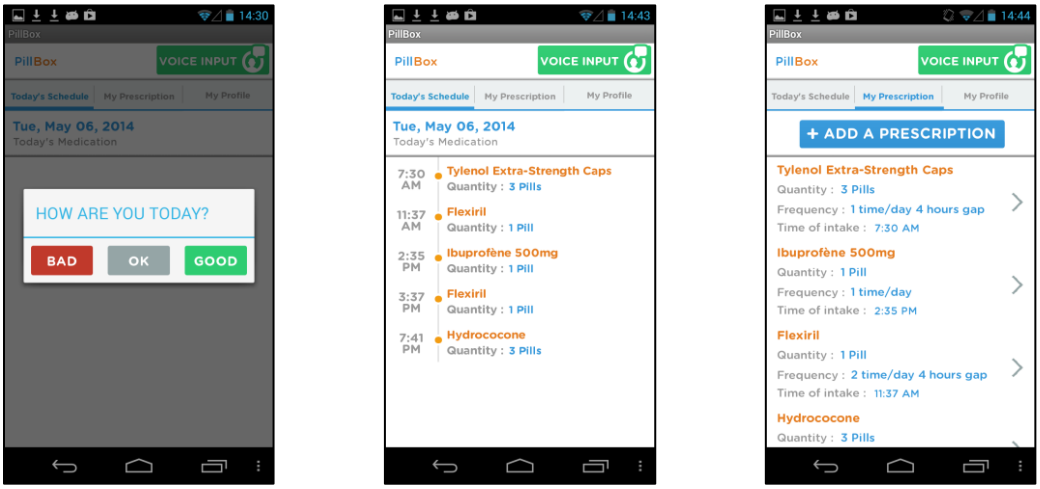


Figure 8: Medication intake schedule and overview of prescriptions

In order to keep the prescription list up-to-date, the user can add a new medication to her prescription or edit existing medications. The following information is entered by the user when adding a new medication: name of medication, quantity, dosage form, frequency, and time of intake. The reminder of medication intake is then automatically set by the system.

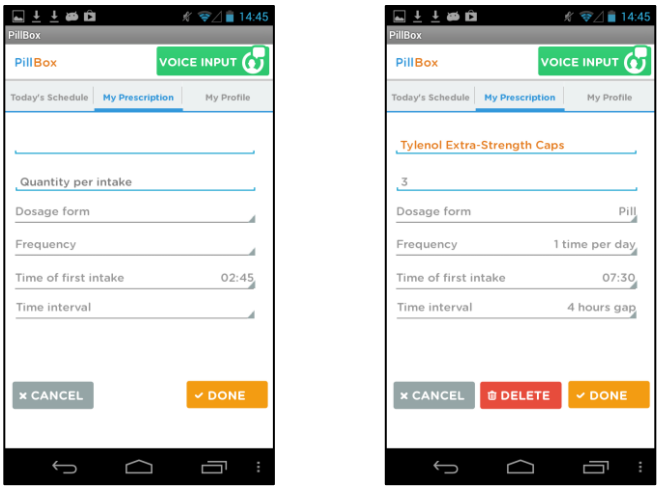


Figure 9: Add new medication and set a reminder

Additionally, the user can report side effects that occurred from the medicine to the doctor or send other comments.

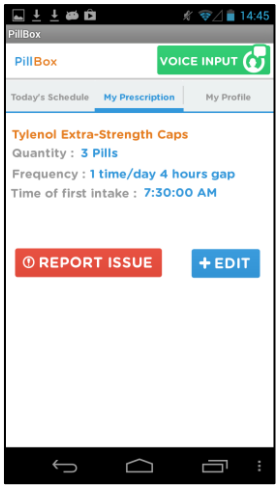


Figure 10: Report side effects and edit prescription

vAssist also provides an overview of physiological data, in this case glycaemia values and blood pressure data.

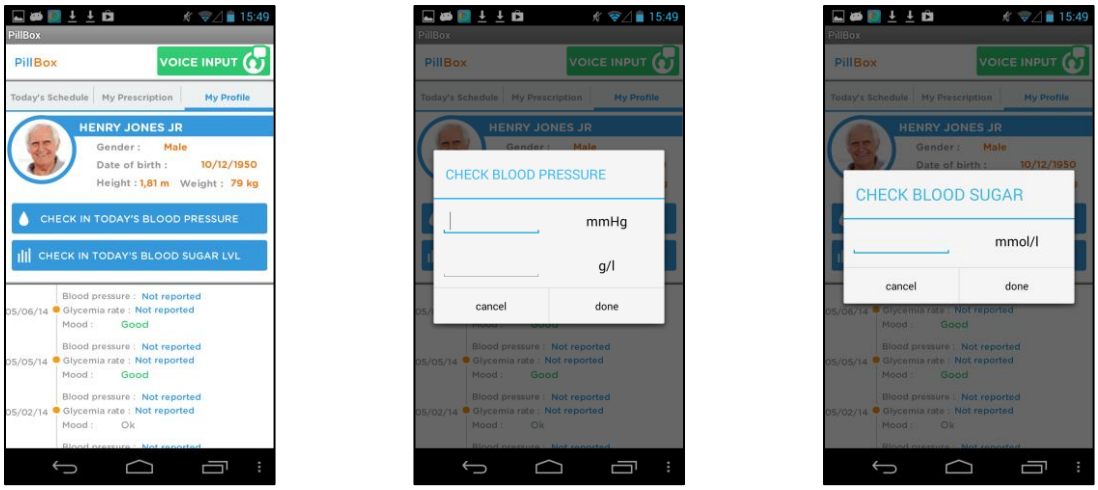


Figure 11: Overview of and entering physiological data

DailyCare app

The DailyCare app can be started from the start screen by tapping on the respective icon or via the DailyCom app. The application is based on the requirement of a health status monitoring function provided by the vAssist system. With the DailyCare app the user is able to create her own well-being account that allows for entering data on the following well-being related functions: physiological, sleep report, pain report, and fitness. As output, vAssist automatically creates a graphical overview of all periodically changing numerical data that can be set to a weekly, monthly, and quarterly overview period. Furthermore, the user has the option to send her well-being report to her formal caregiver (e.g. doctor) for medical monitoring or to the informal caregiver (e.g. a relative) to inform them about the current health status.

When opening the app, the user first sees an overview of the described functions. The user then chooses which data she wants to provide. Upon starting the sleep report, the following data is requested by the app and provided by the user: the time the user went to bed last night, the time the user fell asleep, and the time the user got up in the morning. In addition, the user is able to report the frequency and duration of waking up and the total amount of hours slept. Finally, the user is asked to rate her well-being on a six-point scale.

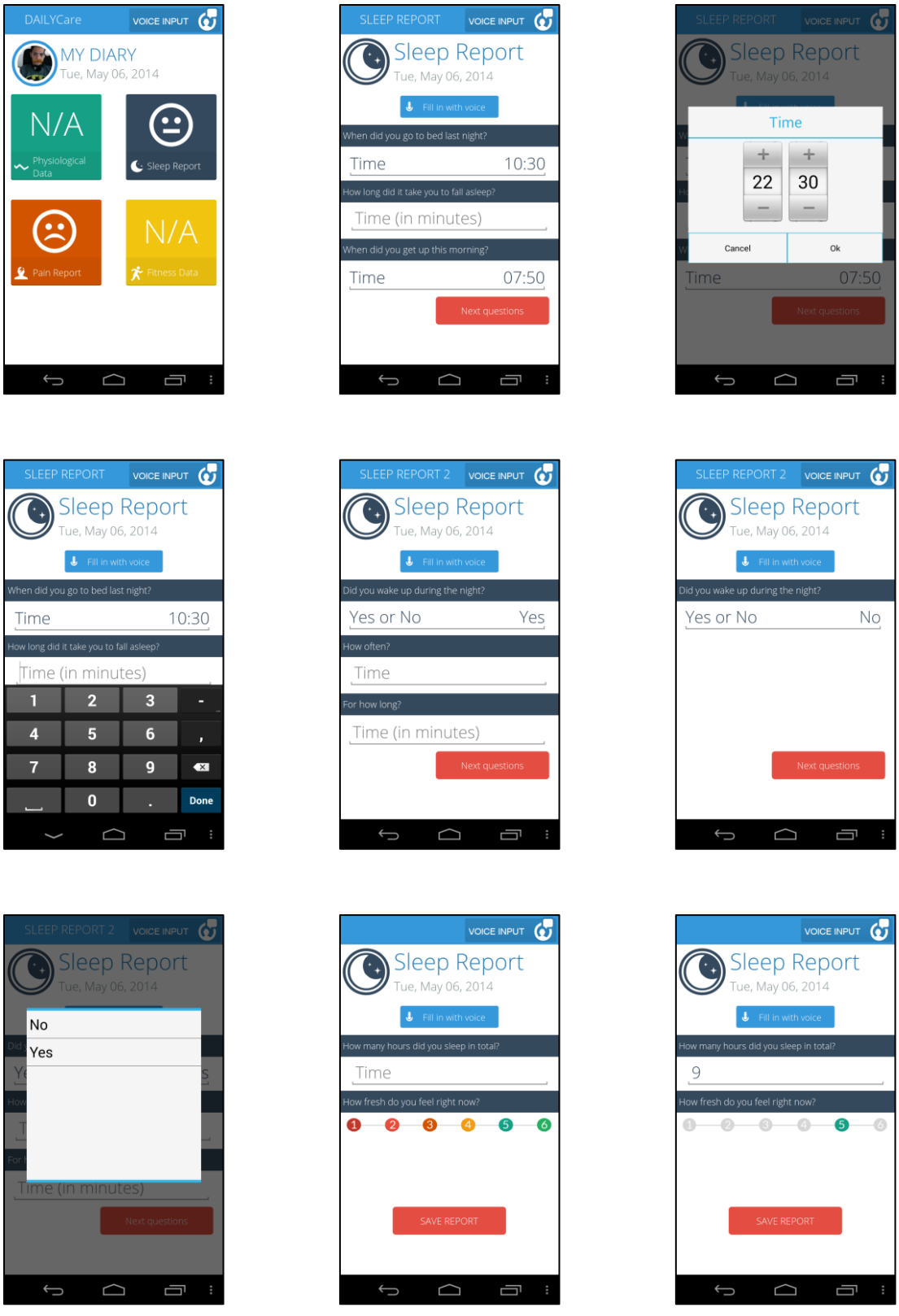


Figure 5: Sleep report overview via text input

7.2.2 DailyCom app

The DailyCom app can be accessed by touching the respective icon on the home screen. Using speech interaction, users are able to access several well-being and communication services. In detail, the user is asked which questionnaires she wants to fill in after she opens the app. In the available questionnaires the user can enter information on her diet, physical activities, and sleep. The contents of the sleep report questionnaire are the same as in the DailyCare app (see section 0). To trigger each speech interaction the user has to touch the microphone icon. The system automatically recognizes when the speech input ends. After each input the system asks the user to confirm whether the input was correctly understood. The entire dialogue with the system is visualized using colored text boxes (blue for the system and grey for the user's input). Further functions of the DailyCom include opening the PillBox app (section 7.2.1) and the DailyCare app (section 0).

7.3 Field Trial

7.3.1 Well-Being Services

PillBox app

Again, the PillBox app can be accessed directly from the start screen by tapping on the icon. It offers monitoring prescriptions, medication intakes and health data. Starting the app, the user can choose between these functionalities.

Figure 12: Overview PillBox

Within the prescriptions the user is able to check today's schedule, set reminders to help remembering the medication intakes and add new prescriptions to the schedule. Adding a new prescription, the user has to enter the name of medication, quantity, dosage form, frequency, and time of intake (e.g. lunch or dinner). In addition, comments can be added.

For the health data monitoring, the system offers to track glycaemia rates and blood pressure values. Reminders can be set to help the users to remember filing in the data on a daily basis. To get an overview of the evolution of the health data, a graphical report is offered.

vAssist allows the user to choose between speech or text input. Figure 14 gives an example of the GUI of both interaction modalities.

DailyCare app

Like the PillBox application, the DailyCare application can be started from the start screen by tapping on the icon. vAssist offers to monitor the user's sleep quality and the fitness activity.

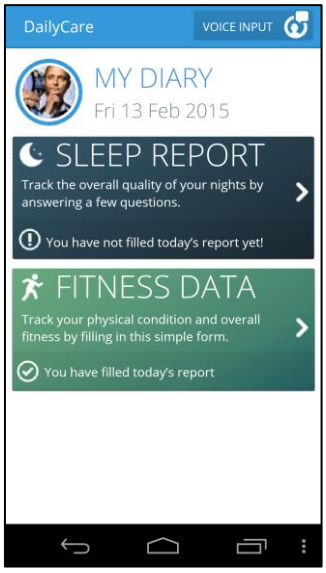


Figure 13: Overview DailyCare

For the sleep report as well as the fitness data report, the user is able to create a new entry, set a reminder or get a visualization of the past entries. In detail, for the sleep report the following data is requested: the time the user went to bed last night, the time the user fell asleep, and the time the user got up in the morning. In addition, the user is able to report how often s/he woke up and the total duration s/he was awake during the night. Finally, the user is asked to rate her well-being on a six-point scale. For the fitness report, the user is able to report the duration of the activity.

Further, the user is able to choose between touch and speech interaction. Figure 14 gives an example of the GUI of both interaction modalities.

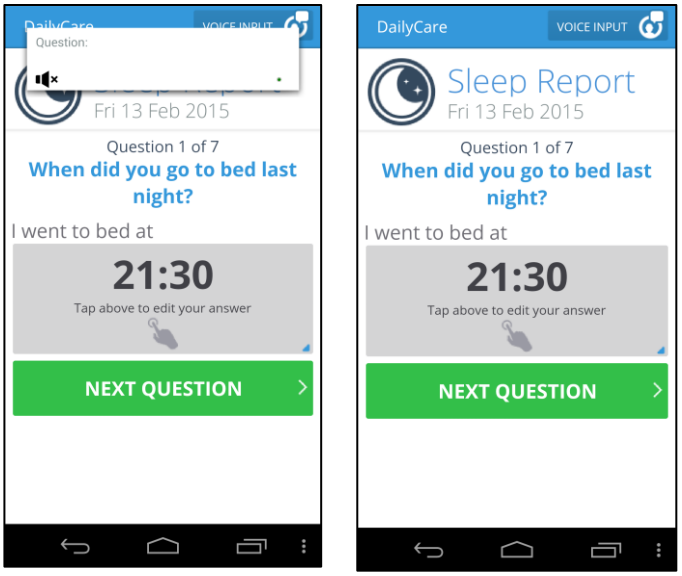


Figure 14: Example of speech (1) and touch (2) interaction

7.3.2 DailyCom User App

To open the DailyCom app on the smartphone the user has to tap the icon. Afterwards, several well-being and communication services can be accessed. In detail, questionnaires regarding diet, physical activities, and sleep can be filled in via speech. DailyCom app also offers a messaging service to send SMS and E-Mails, interacting with other vAssist app (Daly Care and PillBox) or invoking other system services (Agenda, calculator, route calculation, search on the internet).

To trigger the speech input, the user has to touch the microphone icon each time. The entire dialogue with the system is visualized using colored text boxes (blue for the system and grey for the user's input).

7.3.3 DailyCom Administration App

The DailyCom administration application, which can be accessed by the secondary users, i.e. administrator, via web application, has been implemented to allow managing templates and questionnaires. In detail, with the template management function, users have the ability to create, edit and delete the templates, which are the basis of the questionnaires provided via the DailyCom app. With the questionnaire management function, the users have the ability to view, search, and save the questionnaires produced by primary users.

The web application is accessed via the following login page.

Figure 15: Login page

After authentication, the home page, which gives the ability to access the template management and questionnaire management, is displayed.

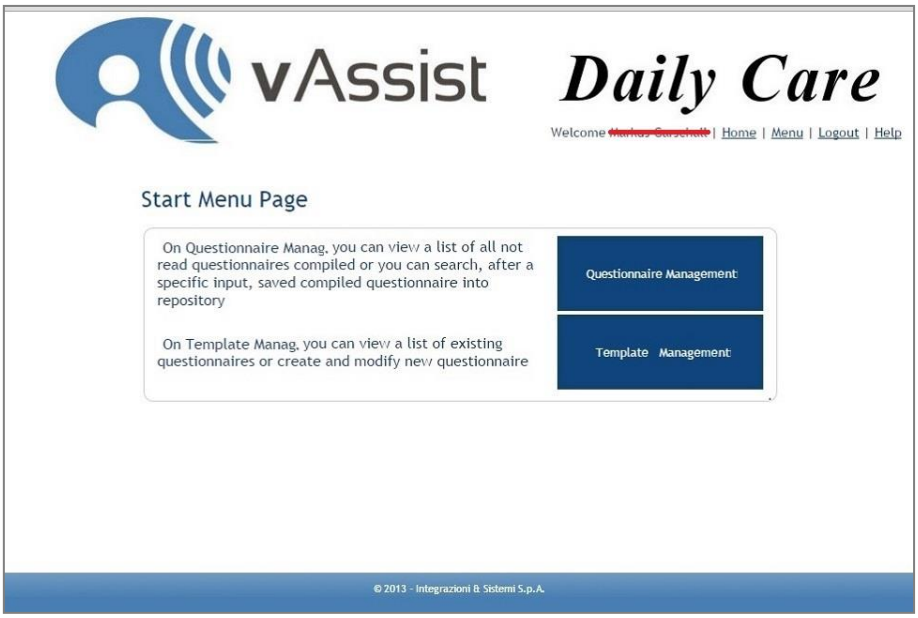
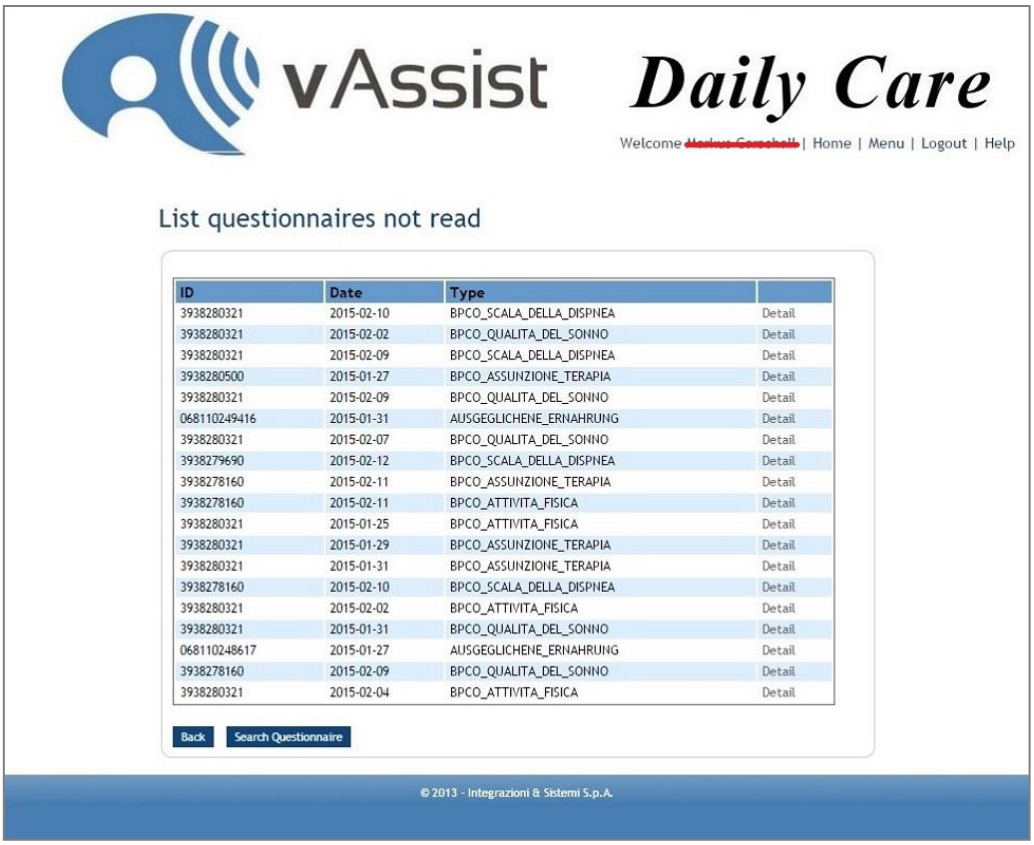


Figure 16: Home page

Within the questionnaire management function, a list of all the questionnaires filled in by users is shown and by clicking on the detail button, all details of a single questionnaire are displayed.



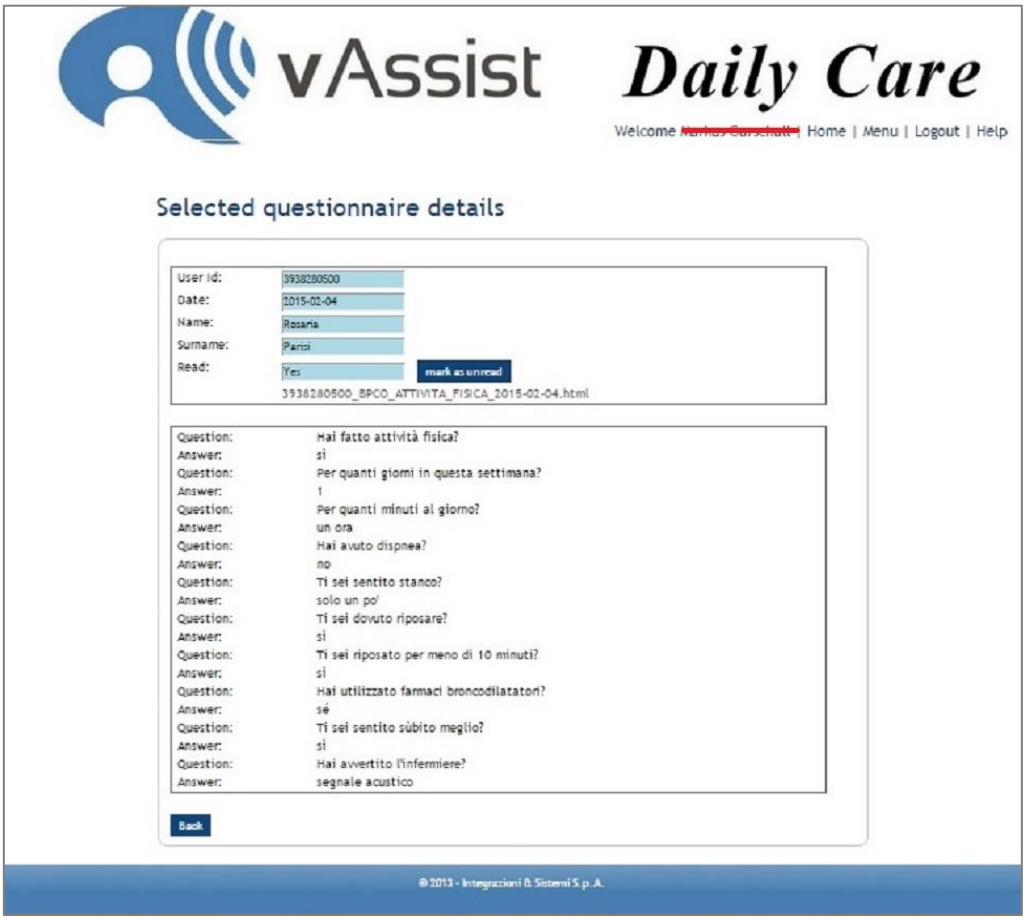


Figure 17: Questionnaire management

The administrator is also able to search a questionnaire by user ID, username and/or surname via the following form:

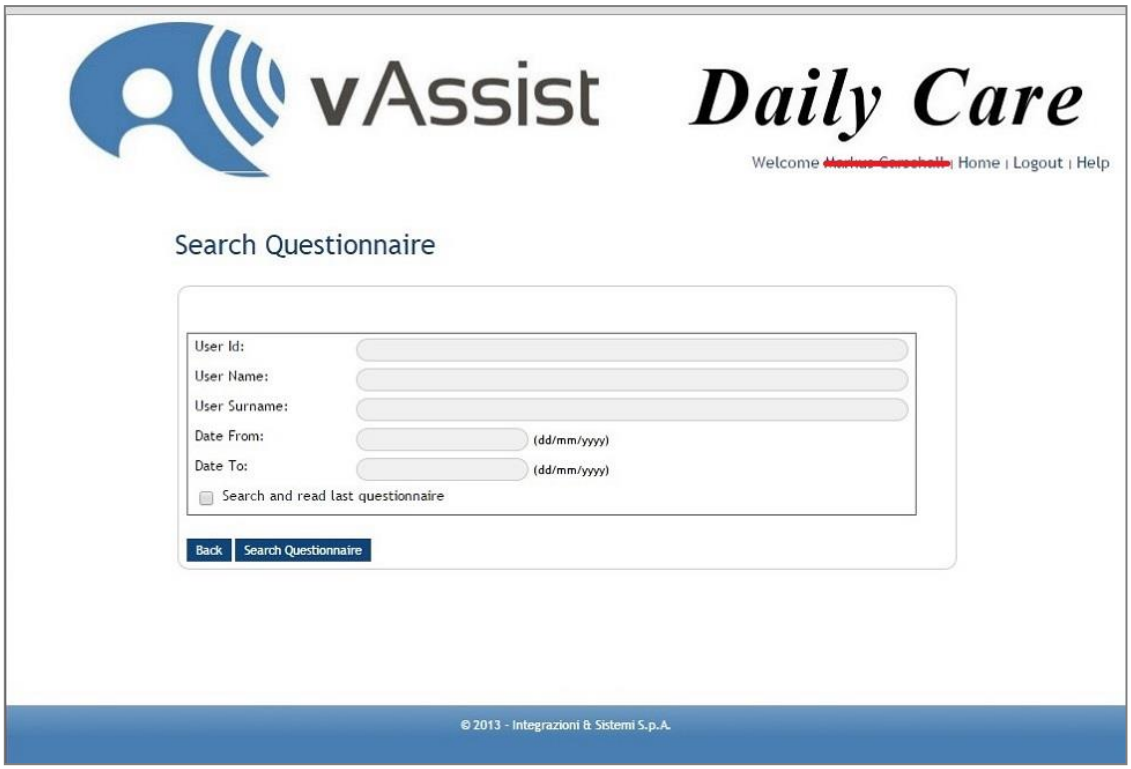


Figure 18: Search mask

The secondary users are also able see the list of all created templates and the details of the respective templates. Further, they can remove a template or create a new one using the form below.

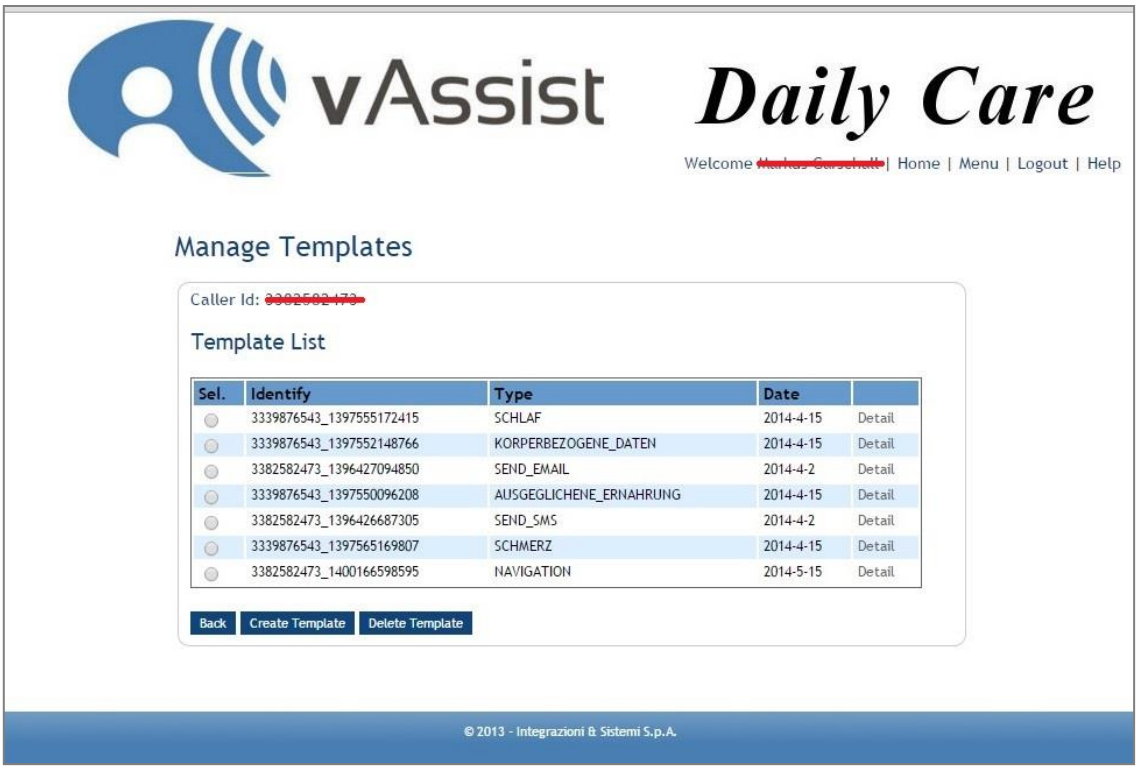


Figure 19: Template management

7.3.4 Ambulatory Terminal

The Ambulatory Terminal (AT) is a small device able to detect activity of user (stand up vs. sit down/lay down), detecting falling situations, and monitor pulse with an additional ear clip. In addition, the AT includes an emergency button. The device must be worn at the belt with a clip; a sensor is able to assess the fit of the AT and a specific LED informs the user about the fit. For pulse monitoring the wired ear clip has to be plugged into the AT with a jack connection. Additional LEDs are used to inform users about charging status/switch on, low battery, noise during pulse monitoring and pulse rating.

Communication with the smartphone and the vAssist application is possible with a Bluetooth Low Energy link. The wireless link between the AT and the smartphone is confirmed in the Status Bar of the smartphone. Charging of the AT is possible via induction, but this feature is not available during the field trial. A traditional wired charging adapter is provided during the field trial.

A long press on the setting button (could vary in function of android devices) within the vAssist applications allows to access the specific menu of the AT. Information regarding pulse rate, pulse rate diary, activity measures and an emergency calls diary and emergency SMS diary are provided.

Regarding ethical restrictions, the fall detection service is not assessed during field trail; the lack of an emergency call platform during this period does not allow evaluation of this feature in safe conditions.

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ANNEX A: Study guide 1st Lab trial

This document contains the description of the study set-up and the results from Task 4.2 lab trails. The aim of the task is to evaluate under standardized conditions the low-fi prototype in the first lab trial and the fully integrated high-fi prototype in the second lab trial with users from both target groups.

As basis for the study set-up of the first lab trial the following sections will first describe the two user groups of the vAssist system and then the construction of the prototype and the goals of the evaluation as well as provide a detailed overview of the procedure of this study.

The results of this lab evaluation constitute the basis for subsequent adaption and modification of the vAssist system and its preparation for the second lab trial.

The following section provides a summary of the goals, the study set-up and the procedure of the lab evaluation.

Participants

The first lab evaluation will be carried out in Austria and France. Each trial site will invite 10 primary users. Austrian participants have to fulfil the inclusion criteria of (fine) motor restrictions. The French trial site will invite 10 primary users that fulfil criterions of suffering on chronic diseases like COPD or have little problems with memory or vision but might have motor and mnemonic problems.

Layers of the prototype

In the first lab evaluation a functional prototype of the system will be applied which represents the basic concept of the vAssist system. The prototype consists of 2 parts:

- PillBox app
- DailyCare app

PillBox app

The PillBox app consists of the following screens:

- Today's Schedule
- My Prescriptions
- My Profile

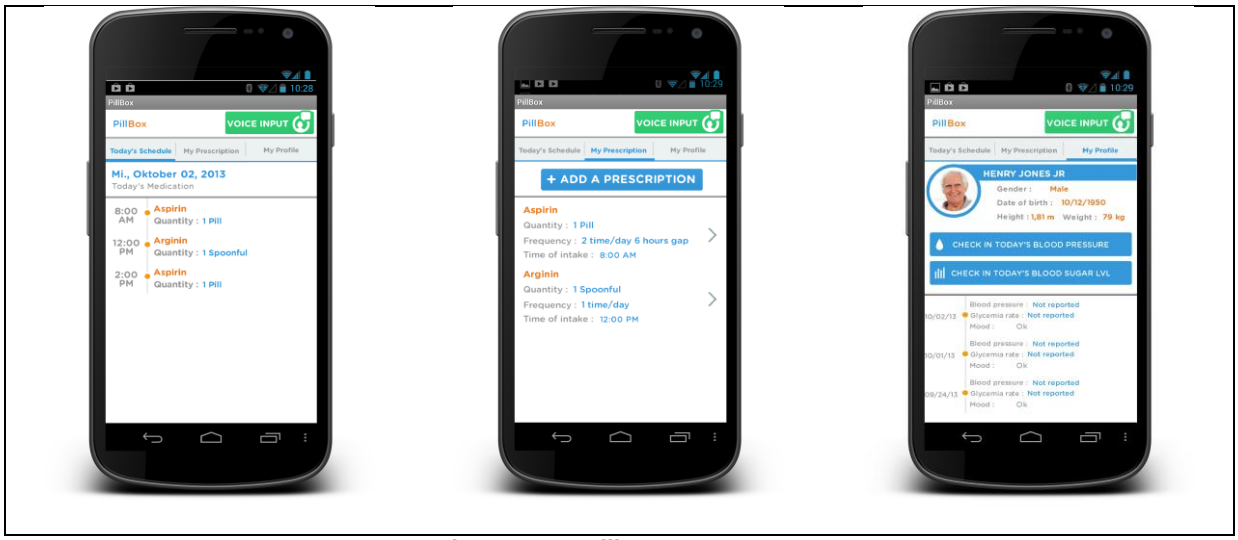


Figure 1: My PillBox app screens

The PillBox app can be accessed directly by tapping on the respective icon on the display of the smart phone. With this application the user is able to monitor all his prescriptions and its individual intake time as well as the amount of pills at one glance. Moreover the user can easily add and change new prescriptions and create reports about occurring side effects of certain medicaments.

DailyCare App

The DailyCare app consists of the following screens:

- Start screen with 4 sub-menus (physiological data, sleep, report, pain report, fitness data

Figure 2: Start screen DailyCare app

- Each submenu contains different questionnaire

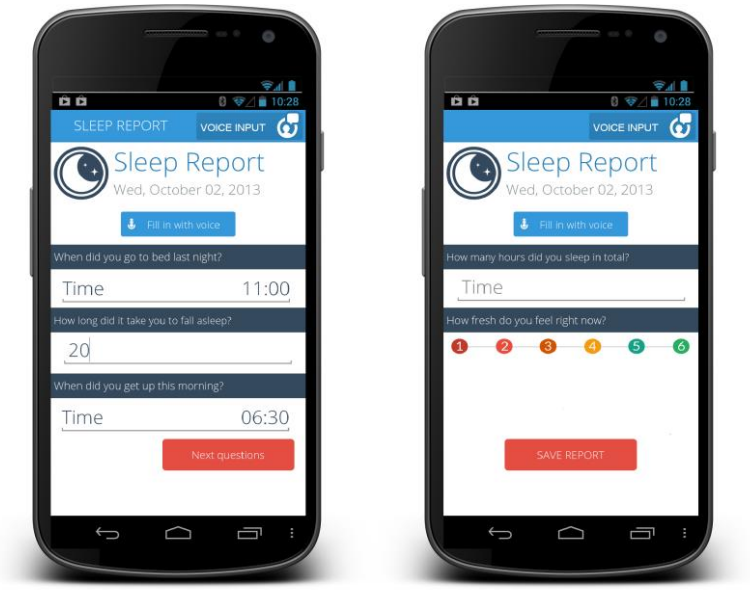


Figure3: Questionnaire of the Sleep report

The DailyCare app bases on the requirement of a health status monitoring function provided by the vAssist system. The user can enter well-being data like physiological parameters, pain and sleep quality as well as conducted physical activities of the day and the week. As output vAssist creates automatically a graphical overview of all periodic changing numerical data that can be set to a weekly, monthly and 3 month overview period (not available in the first lab trial).

Procedure of lab trials

The lab evaluation is divided into the following parts:

- *Introduction:* Welcome, introduction to the project and its objectives, overview about the evaluation and informed consent
- *Use scenarios:* Successive completion of use scenarios, post-experience-interview and questionnaires
- *Post-interview and questionnaires*: Qualitative and quantitative feedback to the functionality of the prototype
- *End of the evaluation*: End of the lab trial and assignment of the allowance

In order not to exhaust the participants the lab evaluation should not exceed the maximum length of 90 minutes.

Introduction

Welcome and presentation of the purpose of the evaluation:

- Welcome: *"First I want to thank you very much for coming. My name is_____ . Today I will present you a prototype which has been developed as part of the project vAssist. Your opinion and impression about the prototype is very important for us to adapt the system to the needs*

and requirements of future users. In this lab evaluation you will not use the whole system but a prototype of this system in which some parts of the planed services will be available."

- Purpose: *"Within the vAssist project a voice controlled communication and care system is developed. The target group includes elderly people (65+) who suffer under (fine) motor restriction or chronic diseases. Services of the system are addressable via natural speech commands to compensate interaction issues that could arise from the mentioned constrains. In addition elderly people do not need to learn new interactions techniques. The vAssist system will be compatible with devices that already exist in the home environment, like Smart phone, PC, TV etc. "*
- Presentation of the smartphone: Show the smart phone to the participants
- Procedure: *"The evaluation consists of a pre-interview, the test scenarios and a closing post-interview. After the pre-interview I will ask you to complete different task with the prototype. For this I will give you a short introduction to each task and then asks you to carry out the task. During each task I will asks you some questions and take some notes regarding certain aspects of the system. After each tasks we will shortly talk about how you managed to complete the task with the use of the system. When you have completed all test scenarios I will ask you to provide me feedback concerning the whole prototype system and which negative and positive aspects you noticed. "*
- Method: *"To see if any issues and problems arise during the task completing I will have a look on how you get along with the system use. For this purpose I would like you to think aloud and comment different working steps. If you have any problems or you do not know how to proceed I will give you some advises. It is important that you know that we do not evaluate you as a test person but the system prototype. Therefore you cannot make any mistakes."*
- Informed consent: *"For documentation purposes we would like to record the lab evaluation. To be allowed to do this, I would ask you to complete and sign the information consent."*

Pre-interview

After the participant has signed the informed consent and received a brief introduction the facilitator will ask the following questions to the participant:

1. "*How old are you?"*
2. *"Are you*
    a. *Male*
    b. *Female?"*
3. *"What was your profession before you retired?"*
4. *"How much experience do you have with touch screen devices?"*
    a. None
    b. I tried it once
    c. I use it sometimes (e.g. when I play with my grandchildren, friends have it)
    d. I own a touch screen device
        (1) Smart phone

and use it every day ☐ and use it not every day but often ☐

(2) Tablet

and use it every day ☐ and use it not every day but often ☐

(3) Others_____

and use it every day ☐ and use it not every day but often ☐

5. *"Which physical restriction that you have generally constricts you when you interact with touch screen devices?"*
6. *"Because of your physical restrictions, how do you generally interact with the"*
    a. Smart phone?
    b. Tablets?
    c. Mobile device?
    d. PC/laptop?
7. *"How often do you have physical appointments with your doctors?"*
    a. More than once a week with at least one doctor
    b. Once a week with at least with one doctor
    c. Two times a month with at least with one doctor
    d. At least once in a month with at least one doctor
    e. Fewer than at least once a month
8. *"How stressful is it for you to go to these physical appointments?"*
    a. Not stressful at all
    b. A little stressful
    c. Rather stressful
    d. Very stressful
9. *"If you would have the chance to reduce the frequency of physical appointments, would you do that?"*
    a. Yes
    b. No
    c. For me it is ok

Use scenarios

The participant will complete all scenarios in the following sequence. After the completion of each scenario the user will get ask how he/she experiences the task according to the Single-Ease-Question [2]

Overall, this task was:

Very difficult ☐ ☐ ☐ ☐ ☐ ☐ ☐ Very easy

[2] Tedesco, D.P., Tullis, T.S., 2006. A comparison of methods for eliciting post-task subjective ratings in usability testing. Paper presented at the Usability Professionals Association Annual Conference. UPA, Broomfield,

Touch scenarios

Scenario 1: PillBox (touch only)

Introduction: *"Now we will start with the evaluation. Here you see a smart phone which represents the prototype of the vAssist system. There are already some services available that will be the target of our evaluation (show PillBox and DailyCare icon to the participant). Please start first the PillBox the vAssist application on the smartphone."*

1. The user starts the vAssist application (PillBox)
2. vAssist asks: "Hello! How are you today?"
3. User answers/(presses): "Good/ok/bad"

Tasks:

Start screen

1. *"Please have a look at the start screen without tapping anything.*
   What do you see? Which information is provided to you?"

"Please imagine you were taking several pills every day. Sometimes it could be difficult to have them all in mind, especially if you think about different doses and intake times. But fortunately the vAssist system supports you with this issue by providing an application that is called PillBox."

Overview prescriptions

2. *"You have in mind that today you are supposed to take Aspirin but unfortunately you forgot when and how many pills. Please have a look at your schedule from today."*
    1. User finds Aspirin **(intake at xx:xx am, X pills)**

New prescription

3. *"Two days ago you received a new prescription, Flexiril, from your doctor. In order to take this new medicament at the right time and applying the right dose you want to add this to your PillBox application. How would you proceed?"*
    1. User goes to my prescription."
    2. User presses "add prescription"
    3. User enters Data from new prescription
    4. User presses: "Done"

Change prescription

4. *"Now that you are done with the new prescription, you want to change another prescription, the Paracetamol, to update it. How would you proceed?"*
    1. User presses on "Paracetamol"
    2. User presses on "edit"
    3. User changes data

4. User presses: "Done"

5. *"You already took 2 pills of Aspirin and have noticed some slight effects. Now you want to first enter this information about the side effect and afterwards send a report about the side effects. Please tell vAssist that you want to report a side effect."*
    1. User presses on "Aspirin"
    2. User presses "report side effects"
    3. User enters data
    4. User presses: "Done"

Blood pressure check/change

"Now you want to check some of your daily care data, the blood pressure and blood sugar since you need to monitor these values regularly for a better health management."

6. *"Please tell vAssist that you want to check your blood pressure!"*
    1. User goes to "my profil"
    2. User presses "check my blood pressure"
       User enters data
    3. User presses: "Done"

7. *"Well done. Now you want to change your blood sugar value. Because you recognized that there is something wrong. "*
    1. User presses "check in today's blood sugar"
    2. User enters data
    3. User presses: "Done"

"Well done! Please go back to the main menu "

Single-Ease-Question:

Overall, this task was:								
Very difficult	☐	☐	☐	☐	☐	☐	☐	Very easy

Scenario 2: DailyCare (touch only)

Introduction: *"Now you see on the home-screen the other application, the "DailyCare App". With vAssist you can monitor your own well-being status using a daily care application. Please open the DailyCare App."*

First impression

1. *"What is your first impression? Which information can you enter?"*

Sleep report

"The vAssist system supports you in your health-care management in order to reduce physical appointments with your doctor. For this, you can enter different reports about important parameters of your health status, like sleep, pain, fitness and physiological data."

1. *"Sleep is very important. To monitor if you have a good and regenerative sleep you can report everyday your sleep quality. Please tell vAssist how you slept this night."*
    1. User opens "Sleep Report"
    2. vAssist displays: "When did you go to bed last night?
    3. User enters: "xx:xx pm"
    4. vAssist displays:" How long did it take you to fall asleep?"
    5. User enters: "x hour"
    6. vAssist displays: "When did you get up this morning?"
    7. User enters "xx:xx am"
    8. vAssist displays: "Did you wake up during the night?"
    9. User enters: "Yes/no"
    10. If yes ➔ vAssist displays: "How often??"
    11. User enters: "x times"
    12. vAssist displays: "For how long?"
    13. User enters: "for x minutes"
    14. vAssist displays: "How fresh and rested do you feel right now?"
    15. User selects: "1/2/3/4/5/6"
    16. vAssist displays: Do you want to save the report or answer additional questions to complete the report?"
    17. User enters: "Save" / "More"
    18. If selected "more"➔ vAssist displays: "What makes you to have a good sleep?
    19. User enters: "xxxx"
    20. vAssist displays: "What makes you to have a bad sleep?"
    21. User enters: "xxx"
    22. vAssist displays: "Do you have any go-to-bed rituals?"
    23. User enters: "xxx"
    24. vAssist displays: "Have anybody told you so far that:
        a) snore very loud
        b) stop breathing for short or long time
        c) disoriented in the night
        d) agitation
    25. User enters: "a/b/c/d"
    26. vAssist displays: "Do you want to save the report"

    User presses: "Save"

„Well done! Now we are done with the scenarios and will proceed with a post-interview. "

Single-Ease-Question:

Overall, this task was:								
Very difficult	☐	☐	☐	☐	☐	☐	☐	Very easy

Speech scenarios

Scenario 3: PillBox (speech only)

Introduction: "We will go through the PillBox application again, but with the difference that you will use only your voice, without the need of touching the display. So you will interact with vAssist via Voice. Please speak out your answers and try to pronounce to words clearly."

We will open the PillBox now…

Welcome

1. *vAssist: "Hello, how are you?"*

Prescription

"Two days ago you received a new prescription, Flexiril, from your doctor. In order to take this new medicament at the right time and applying the right dose you want to add this to your PillBox application."

1. vAssist: "Please type in the name of the new medication."
2. vAssist:" What are the directives for the drug intake?"
3. vAssist:" At what time during the day is the first intake?"
4. vAssist: "What is the time-interval during the intakes?"
5. vAssist:" Anything else?"

Change prescription

"Now that you are done with the new prescription, you want to change another prescription, the Paracetamol, to update it.

6. vAssist: "Which prescription do you want to change?"
7. vAssist:" What would you like to change?"
8. vAssist: "Anything else?"

Side Effect

"You already took 2 pills of Aspirin and have noticed some slight effects. Now you want to first enter this information about the side effect."

1. vAssist:" For which prescription do you want to report a side effect?"
2. vAssist:" Please descript your condition"

Blood pressure check

"Now you want to check your blood pressure and blood sugar since you need to monitor these values regularly for a better health management."

1. vAssist:" What is your mmHg value today?"
2. vAssist:" What is your g/l value?"
3. vAssist:" What is your mmol/l value today?"

"Very good! Now we will continue with the other application."

Scenario 4: DailyCare (speech only)

Introduction: *"Now you see on the home-screen the other application, the "DailyCare App". With vAssist you can monitor your own well-being status using a daily care application. Please open the DailyCare App.*

First impression

1. *"What is your first impression? Which information can you enter?"*

Sleep report

"Now we will go through the sleep report again, but this time please use only your voice and speak out loud and clearly your answers."

1. vAssist:" When did you go to bed last night?"
2. vAssist:" How long did it take you to fall asleep?"
3. vAssist:" When did you get up this morning?"
4. vAssist:" Did you wake up during the night?"
5. vAssist:" How often?"
6. vAssist:" For how long?"
7. vAssist:" How fresh do you feel right now?"
8. vAssist:" Do you want to save the report or answer additional questions to complete the report?"
9. vAssist:" What makes you have a good sleep?"
10. vAssist:" What makes you having a bad sleep?"
11. vAssist:" Do you have any go-to-bed rituals?
12. vAssist:" Has anybody told you so far that you snore very loud?"
13. vAssist:" Has anybody told you so far that, when sleeping, you stop breathing for short or long time?"
14. vAssist:" Has anybody told you so far that you are disoriented in the night or agitated?"
15. vAssist:" Do you want to save the report?"

Pain report

"Now vAssist will support you in creating a pain report. Please imagine that you had some headaches and back pains during the last three days and answer loud and clearly to the questions."

1. vAssist:" At which location does the pain occur?"
2. vAssist:" How often does the pain occur?"

3. vAssist:" What is the nature of pain?"
4. vAssist:" How intense is the pain?"
5. vAssist:" When did the pain start?"
6. vAssist:" How much does the pain constrain you in your daily activities or other tasks?"
7. vAssist:" What do you do for pain relief?"
8. vAssist:" Do you want to save the report?"

Fitness Data – weekly goal and todays' activity

"Ok, well done! The next scenario will be a fitness report. Your weekly plan was to participate at least 3 times at your Nordic walking lessons. One lesson lasts 1 hour.
Imagine you went instead of three times only two times to the Nordic walking lessons, because one day you really had a bad headache. But next week you will try to go there three times. "

1. vAssist:" Did you complete your exercises this week?"
2. vAssist:" How much of the exercise plan did you complete?"
3. vAssist:" What causes you not to complete your exercises?"
4. vAssist:" What is your fitness goal for this week?"
5. vAssist:" Do you want to save your weekly exercise data?"

"Ok, good! Now vAssist will ask you about your todays' activities because being active is always good for your health and therefore also important for a good health management.
Imagine you took your dog for a 30 minutes' walk and afterwards you did some gardening for 1 hour."

6. vAssist:" What activities have you done today?"
7. vAssist:" For how long?"
8. vAssist:" Something else?"

repeat as long as all activities have been reported

9. vAssist:" Do you want to save yours today activity report?"

Fitness Data – Eating Habits (speech only)

"Well done! Now vAssist asks you about your eating habits. A balanced diet is very good for every-one's and therefor very important for a good health management. Just tell vAssist what you have eat-en today."

1. vAssist:" What did you eat today for breakfast?"
2. (~~vAssist:" How big was the eaten portion size~~?")
3. vAssist:" What did you eat for lunch?"
4. vAssist:" What did you eat for dinner?"
5. vAssist:" Did you have any snacks in between?"
6. vAssist:" Which drinks, liquids have you had today?"
7. vAssist:" How much of a cup/glass?"
8. vAssist:" What else?"
9. vAssist:" Do you want me to save your eating report?"

"Thank you very much. Now we continue with the last scenario"

Scenario 5: Communication (speech only)

SMS & Email (speech only)

"vAssist contains also communication tools, like SMS and Emil services. Imagine you were sending a message to your friend Lisa and tell her that will pick her up for lunch at 12pm."

1. vAssist:" What do you want to tell Lisa?"
2. vAssist:" How do you want to send this message?"

"Very good. Now we are done with the scenarios and will proceed with the post-interview."

Post-interview

After completing the use scenarios a post-interview will be conducted to measure the usability and user experience of the overall system.

- General questions:
    1. *"How satisfied were you with the use of that system?"*
        a. *"Which aspects of the system did you experience as problematic?"*
        b. *"Which aspects of the system did you experience as very positive?"*
    2. *"If you would meet the developer of the system. What would you recommend him/her to change within the application?"*
    3. *"If you were the developer, what else would you add to this application?"*
    4. *"Would you appreciate such a service like vAssist offers and take advantage of it?"*
    5. *"What would be your concerns about such a technology?"*
- Speech activation
    1. *"How would you prefer to activate the speech function?"*
        a. Button
        b. Touch-button (in the display)
        c. Special gesture (e.g. waving the hand)
        d. Speech trigger (e.g. magic word, spell)
- Services
    1. *"What do you think about the label "sprechen (AT)/ parler (FR)"? – would you prefer another description for that?"*
    2. *"Would you prefer an "all-in application" (PillBox and DailyCare together) or separate service application on the desktop?"*
- *Questionnaires: "To close this evaluation here are some questionnaires that measure different aspects of the interaction with the system. Please mark with a cross the answers that correspond best to your experiences with the system. "*
    1. AttrakDiff
    2. SUS
    3. Intui
    4. PSSUQ

End of lab trial

End of the lab trial and assignment of the allowance:

- End of lab trial: *"This is the end of the study. Thank you very much for your support and interest! Your opinion and impressions about this prototype will contribute to an improvement of the system's quality."*
- Hand out the allowance and a copy of the signed receipt to the participant

ANNEX B: Study guide 2nd Lab trial

This document describes the study setup the 2nd lab trial. The aim of this task is to evaluate under standardized conditions prototype in the second lab trial with users from both target groups.

As basis for the study setup of the second lab trial the following sections describe the two user groups of the vAssist system, the prototype and the goals of the evaluation as well as a detailed overview of the procedure of this study.

The results of this lab evaluation constitute the basis for subsequent adaption and modification of the vAssist system and its preparation for the field trial.

Participants

The second trial will be carried out in Austria and France. Each trial site will invite 10 primary users. Austrian participants have to fulfil the inclusion criteria of (fine-) motor restrictions. The French trial site will invite 10 primary users that fulfill criteria of people suffering from chronic diseases like COPD or have little problems with memory or vision and might have motor and mnemonic problems.

Procedure of lab trials

The lab evaluation is divided into the following parts:

- *Introduction:* Welcoming, introduction to the project and its objectives, overview about the evaluation and informed consent
- *Use scenarios:* Successive completion of use scenarios (smartphone, TV)
- *Post-interview and questionnaires*: Qualitative and quantitative feedback regarding the functionality of the prototype
- *End of the evaluation*: end of the lab trial and assignment of the allowance

In order not to exhaust the participants, the lab evaluation should not exceed the maximum length of 90 minutes.

Introduction

Welcoming and presentation of the purpose of the evaluation:

- *Welcoming:* “First I want to thank you very much for coming. My name is_____ . Today I will present you with a prototype, which has been developed as part of the project vAssist.”
- *Informed consent:* “Before we start, I’d like to ask you to sign a so called informed consent to confirm your willingness to participate. Further, for documentation purposes we would like to record the lab evaluation. Please, take your time to read the whole document before you sign. If you have any questions regarding the informed consent, please do not hesitate to ask!”
- *Introduction:* “Thank you very much!” Your opinion and impression about this prototype is very important for us to adapt the system to the needs and requirements of future users. As this is still a prototype, only some parts of the planned services will be available. Due to this fact it might happen that some error messages occur or that some functions do not work. Nevertheless, we would like to evaluate the current prototype already to ensure that the wishes and

concerns of the users are taken into account in all stages of the project. Of course, I am here to support you in case of any unexpected problems ..."

- *Purpose: "*Within the vAssist project a voice controlled communication and care system is developed. The target group includes elderly people (65+) who suffer from (fine-) motor restrictions or chronic diseases. Services of the system are addressable via natural speech commands to compensate interaction issues that could arise from the mentioned constraints. In addition, elderly people do not need to learn new interactions techniques. The vAssist system will be compatible with devices that already exist in the home environment, like Smartphones, PCs, TVs etc. "
- *Presentation of the smartphone and TV:* Show the smartphone and TV to the participants
- *Procedure: "*The evaluation consists of a pre-interview, the test scenarios and a closing post-interview. After the pre-interview I will ask you to complete different tasks with the prototype. I will give you a short introduction to each task and then ask you to carry out the task. During each task I will ask you some questions and take notes regarding certain aspects of the system. After each task we will shortly talk about how you experienced the task and the use of the system. As soon as you are done with all test scenarios I will ask you to provide me with feedback about positive and negative aspects you noticed and about the entire prototype system. All feedback, both positive and negative, is very much appreciated. It helps us in the further development of the system and ensures that any improvements are in line with the wishes and needs of the users."
- *Method: "*To see if any issues and problems arise during the task completion, I will have a look on how you get along with using the system. For this purpose I would like you to think aloud for each step you take during task completion. For that I will take notes. In case you encounter any problems or do not know how to proceed, I will be there to help and provide you with advice. It is important that you know that we do not evaluate you as a test person but the system prototype. There are no right or wrong answers!"

Pre-interview

After the participant has signed the informed consent and received a brief introduction, the facilitator will ask the participant the following questions:

10. "How much experience do you have with touch screen devices?"
    a. None
    b. I tried it once
    c. I use it sometimes (e.g. when I play with my grandchildren, friends have it)
    d. I own a touch screen device
        (1) Smartphone
        and use it every day ☐
        and use it often but not every day ☐
        and use it rarely ☐

(2) **Tablet**

and use it every day ☐

and use it often but not every day ☐

and use it rarely ☐

(3) **Others**_____

and use it every day ☐

and use it often but not every day ☐

and use it rarely ☐

11. "Are there any physical restrictions that you have, which make it difficult for you to interact with touch screen devices? If so, which ones…?"
12. "How do these physical restrictions influence your interaction with the following devices? Please describe some of the typical problems that you encounter.""
    (1) With smartphones…?
    (2) With tablets…?
    (3) With other mobile devices…?
    (4) With PCs/laptops…?
13. "In a typical month, how often do you see your doctor(s)?"(note: as in "face-to-face" / "physical appointments")
    a. More than once a week
    b. Once a week
    c. Every other week
    d. At least once a month
    e. Less than once a month
14. "How stressful is it for you to go to these physical appointments?"
    (1) Not stressful at all
    (2) A little stressful
    (3) Rather stressful
    (4) Very stressful
15. In your opinion, are there too many physical appointments?
16. If it was possible, would you like to reduce the number of physical appointments with your doctor?

Use scenarios

The participant will complete all scenarios in the following sequence. After the completion of each task the user is asked how she experiences the task according to the Single-Ease-Question.

Overall, this task was:								
Very difficult	☐	☐	☐	☐	☐	☐	☐	Very easy

Scenario 1: PillBox app

Introduction: "Now we will start with the evaluation. (Showing the smartphone): This is the device that you will be using on which we installed the prototype of the vAssist system. There are already some services available that will be the target of our evaluation. Now, let me just start the vAssist application and you are good to go!" (Open DailyCom app, give smartphone to the test person)

"Please imagine the following scenario: your doctor prescribed several pills for you to take every day. Managing all the prescriptions, especially keeping track of the different doses and intake times, can sometimes be quite difficult. But fortunately the vAssist system supports you with this task through an application called *PillBox*" (open PillBox app)

Overview prescriptions

1) "You have in mind that today you are supposed to take Aspirin but unfortunately you forgot when and how many pills. Please ask vAssist for today's schedule."
    2. User asks: "Show me Today's Schedule"
    3. User finds Aspirin **(intake at xx:xx am, X pills)**

Overall, this task was:								
Very difficult	☐	☐	☐	☐	☐	☐	☐	Very easy

New prescription

2) "Two days ago you received a new prescription, Flexiril, from your doctor. You want to add this new prescription and free your mind from worrying about dosage and intake times. How would you proceed?"
    5. User asks: "I'd like to add a prescription."
    6. vAssist says: "Please type in the name of the new medication."
    7. User: "X"
    8. vAssist: "What are the directives for the drug intake?"
    9. User answers/types: Pill; Spoonful; Suppository
    10. vAssist: "What are the directives for the drug intake?"
    11. User: "2 pills twice a day"
    12. vAssist: "At what time during the day is the first intake?"
    13. User: "09:30 am"
    14. vAssist: "What is the time-interval during the intakes?"

15. user: “There’s a 4 hour interval“
16. vAssist: “Please check the display. Is the shown summary correct?”
17. User answers: „**Yes**/No“
18. User presses: Done

Overall, this task was:								
Very difficult	☐	☐	☐	☐	☐	☐	☐	Very easy

Change prescription

3) “Now that you are done with the new prescription, you want to update (change) an older prescription, namely the Paracetamol prescription. Please ask vAssist to change a prescription!”
    1. User: “I’d like to change a prescription“
    2. vAssist: „Okay“. “Which prescription do you want to change?”
    3. User: “The Paracetamol.”
    4. vAssist: “Do you want to delete this prescription?”
    5. User: “Yes/No.”
    6. vAssist: “What would you like to change?”
    7. User: xxxx
    8. vAssist: “Anything else?”
    9. User: “Yes/**No**”
    10. User presses: Done

Overall, this task was:								
Very difficult	☐	☐	☐	☐	☐	☐	☐	Very easy

4) “You already took 2 pills of Aspirin and have noticed some side effects. You now want to enter this information. Please tell vAssist that you want to report a side effect.”
    1. User: “I’d like to report a side effect.”
    2. vAssist: “For which prescription do you want to report a side effect?”
    3. User: “The aspirin.”
    4. vAssist: “Please describe your condition.”
    5. User: “xxx”
    6. vAssist:” Anything else?”

7. User: “Yes/**No**.”
8. User presses: Done

Overall, this task was:								
Very difficult	☐	☐	☐	☐	☐	☐	☐	Very easy

Blood pressure check/change

“Now you want to check some of your DailyCare data, the blood pressure since you need to monitor these values regularly for a better health management.”

5) Please tell vAssist that you want to check your blood pressure!
    4. User asks: “I’d like to check in my blood pressure?”
    5. vAssist: “very good” What is your mmHg value today?”
    6. User: xxx
    7. vAssist: “Thank you!. What is your r/l value?”
    8. User: xxx
    9. vAssist: ““On the display you see a summary of your values. Are they correct?”
    10. User: “yes/**No**”
    11. User presses: Done

Overall, this task was:								
Very difficult	☐	☐	☐	☐	☐	☐	☐	Very easy

“Well done. Now you want to change your blood pressure data. Because you recognized that there is something wrong. “

6) “Please ask vAssist to change your blood pressure!”
    1. User: „I’d like to change my blood pressure”
    2. vAssist: “What would you like to change?”
    3. Display show options
    4. User selects option(s) and edits data (speech/touch input)
    5. User presses: Done

Overall, this task was:								
Very difficult	☐	☐	☐	☐	☐	☐	☐	Very easy

Blood sugar check/change

"Now you want to check your blood sugar. This is very important as you would like to eat some of your self-baked cookies."

7) "Please ask vAssist that you want to check your blood sugar!"
    1. User: „I'd like to check in my blood sugar"
    2. vAssist: „Great! What is your mmol/l value today?"
    3. User: „xxx"
    4. vAssist: „Please check the display. Is the shown value correct?"
    5. User: „**Yes/**No"
    6. User presses: Done

"Well done!"

Overall, this task was:								
Very difficult	☐	☐	☐	☐	☐	☐	☐	Very easy

Scenario 2: DailyCare app

Introduction: "With vAssist you can monitor your own well-being by using the so-called DailyCare application. On the home screen of the smartphone you can find a menu where you can select from different applications. Now you want to use the DailyCare application to enter your data on today's health status. Please open the DailyCare application." (give smartphone to the test person)

Open app

"To open the application, please touch the DailyCare icon."

Sleep report

"The vAssist system supports you in your health-care management, which should help reduce physical appointments with your doctor. For this, you can enter different data about important parameters of your health status, like sleep, pain, fitness and physiological data."

2) "A good night's sleep is very important. To monitor your sleep quality, please enter how you slept this night."
    1. User: "I want to add a new sleep report."
    2. vAssist: "When did you go to bed last night?
    3. User: "xx:xx pm"
    4. vAssist:" How long did it take you to fall asleep?"
    5. User: "x hour"
    6. vAssist: "When did you get up this morning?"
    7. User: "xx:xx am"
    8. vAssist: "Did you wake up during the night?"
    9. User: "Yes/no"
    10. If yes ➔ vAssist: "How often??"
    11. User: "x times"
    12. vAssist: "For how long?"
    13. User: "for x minutes"
    14. vAssist: "How fresh and rested do you feel right now?"
    15. user: "1/2/3/4/5/6"
    16. vAssist: Do you want to save the report or answer additional questions to complete the report?"
    17. User: "Save" / "More"
    18. If more➔ vAssist: "What makes you to have a good sleep?
    19. User: "xxxx"
    20. vAssist: "What makes you to have a bad sleep?"
    21. User: "xxx"
    22. vAssist: "Do you have any go-to-bed rituals?"
    23. User: "xxx"
    24. vAssist: "Have anybody told you so far that you:
        a) snore very loud
        b) stop breathing for short or long time
        c) disoriented in the night
        d) agitation
    25. User: "a/b/c/d"
    26. vAssist: "Do you want to save the report"
    27. User: "Save"

Well done!"

Overall, this task was:								
Very difficult	☐	☐	☐	☐	☐	☐	☐	Very easy

Scenario 3.: DailyCom app

*Introduction: "*A healthy and balanced diet is important for a healthy life and the overall well-being. Therefore, vAssist supports the user in maintaining an overview of his or her eating habits."

Questionnaire "Balanced diet"

1) "Please, fill in the questionnaire regarding your nutrition intake. vAssist will ask you for data of 'today'. Just imagine you would fill in the questionnaire yesterday evening."
    1. vAssist: "Hi, the questionnaires you can fill in are: balanced diet or physical data or sleep. Which questionnaire do you want to fill?"
    2. User: "Balanced diet"
    3. vAssist: "What did you eat today for breakfast."
    4. User answers the question
    5. vAssist: "How big was the eaten portion size?" (nothing, a quarter, an half, three-quarters, all)
    6. User: "Nothing" or "A quarter" or "An half" or "Three-quarters" or "All"
    7. vAssist; "What did you eat for lunch?"
    8. User answers the question
    9. vAssist: "What did you eat for dinner?"
    10. User answers the question
    11. vAssist: "Did you have any snacks in between?"
    12. User answers the question
    13. vAssist; "Which drinks or liquids have you had today?"
    14. User answers the question
    15. vAssist: "How much of a cup?"
    16. User answers the question
    17. vAssist: "What else?"
    18. User answers the question

"Well done!"

Overall, this task was:

Very difficult ☐ ☐ ☐ ☐ ☐ ☐ ☐ Very easy

Scenario 4: TV as an interaction device

*Introduction: "*The vAssist system will be compatible with devices that already exist in the home environment of the users. In addition to the vAssist applications on the smartphone, which you are already familiar with, the system offers to use the TV as an interface.

Now, we will test an available system so you get an idea about the possibilities of a future vAssist system on the TV. We will use Google Now, a widespread application with speech interaction. To start the voice input, you have to say "Ok Google". Give it a try!"

Sight seeing

"Please imagine that you would like to travel to [a local city] because a friend told you he really liked the city. Now, you are considering a trip to [a local city] too. You want to know which places of interest you could visit. Please ask Google for an answer. Keep in mind that you have to say "Ok Google" to trigger the input."

1. User: "Ok Google. Show me the places of interest in [a local city]"
2. Google: "[A local city] points of interest." (Google shows POIs)

Pictures

"Is there any point of interest you are interested in? Please choose one and ask Google to show you some pictures of it."

1. User: "Ok Google. Show me pictures of (point of interest)"
2. Google shows pictures of the point of interest.

"Well done!"

Weather

"Because you like to explore cities by foot, you want to make the trip when the weather looks promising. Please ask Google whether it will be raining tomorrow."

1. User: "Ok Google. Will it be rainy in [a local city] tomorrow?"
2. Google: e.g. "No, rain is not expected in [a local city]. The forecast is 23° and mostly cloudy."

Route

"So, the weather is perfect for a trip." or "Please, imagine the weather would be perfect for a trip."
"Now, you want to know how long the trip to [a local city] would take. Please, ask Google how long a trip takes from [current location] to [a local city]."

1. User: "Ok Google. How long takes a trip from [current location] to [a local city]?"
2. Google: "The drive from [current location] to [a local city] is 194.5 km."

"Well done! Now, I would like to ask a few questions regarding your experience with the TV."

1. "What do you think about using the TV as an interaction device?"
2. "What do you think about the possibility of using a "magic word", in this case 'Ok Google', to activate speech interaction?"
3. Does a magic word which could fit to the vAssist system spring to your mind?
4. There are other possibilities to activate the speech interaction. In general, which one would you prefer?
    a. An hard button
    b. A soft button on the display

c. A specific activation gesture
d. A magic word"

(note comments)

"Now we are done with the scenarios and will proceed with a post-interview."

Post-interview

After completing the use scenarios, a post-interview will be conducted to measure the usability and user experience of the overall system.

- *General questions:*
    1. "In general, what do you think about vAssist?"
    2. "Comparing vAssist on the smartphone with vAssist on the TV, what are the benefits and drawbacks of the two interfaces?"
    3. "How satisfied were you with the use of that system?"
        a. "Which aspects of the system did you experience as problematic?"
        b. "Which aspects of the system did you experience as very positive?"
    4. "If you would meet the developer of the system. What would you recommend him/her to change within the application?"
    5. "If you were the developer, what else would you add to this application?"
    6. "Would you appreciate a service like vAssist, what it offers, and take advantage of it?"
    7. "What would be your concerns about such a technology?"
    8. "Is there anything else you want to add or comment on?"

- *Questionnaires:* "Now, we would like you to fill in some questionnaires that measure different aspects of the interaction with the system. Please mark with a cross the answers that correspond best to your experiences with the system. "
    1. SUS
    2. Intui
    3. PSSUQ
    4. SASS

- *Demographics*: "As the final step in this evaluation, we would like to ask a few short question regarding your demographic data"
    1. "What year were you born in?"
    2. "What's your gender?" (Ask as open question.)
        a. Male
        b. Female
        c. Other (including inter- and transgender)?
    3. "What was your profession before you retired?"

End of lab trial

End of the lab trials and assignment of the allowance:

- *End of lab trial*: “This is the end of the study. Thank you very much for your support and interest! Your opinion and impressions about this prototype are highly appreciated and will contribute to an improvement of the system’s quality.”
- Hand out the allowance and a copy of the signed receipt to the participant.

ANNEX C: Study Guide field trial

The field trials start with a workshop where the system and the evaluation plan will be introduced and participants are trained to be able to use the tested services on their own. An informed consent will be handed out to ensure that the participants are fully informed about the project and the field trial. In Austria participants will receive an allowance after the study from the facilitator. In France an allowance will not be provided for the participants. During the field trial, both quantitative and qualitative data will be gathered. At the end, participants will be debriefed.

A handbook, describing the tasks to perform, will be handed out to the participants on a monthly basis. The handbook will also include questionnaires and diaries to fill in on a weekly basis and a manual for the vAssist system. A local telephone helpline for questions regarding the system, tasks, and the study design will be set up. If technical problems occur, the helpline acts as intermediary.

Workshop

At the beginning of each phase, a workshop will take place. This workshop serves as training and introduction to the field trial.

The workshop contains the following phases:

- *Introduction*: Welcoming, introduction to the project and its objectives, overview about the workshop and informed consent
- *Demonstration of the prototype*: Presentation of the interface, interaction modalities and functionalities
- *Training phase*: Participants in moderated small groups complete tasks on themselves
- *Introduction of tasks during the field trial*: Presentation of the procedure and tasks during the field trials
- *Questionnaires*: Quantitative data collection regarding user factors, anticipated acceptance of the system (modified TAM3) and current quality of life via the WHOQOL-BREF.

In order not to exhaust the participants, the workshop will be limited to a maximum duration of 120 minutes.

Introduction

Welcoming and presentation of the purpose of the evaluation:

> *Welcoming:* “First I want to thank you very much for coming. My name is_____. I want to welcome you to the workshop for the field trial of the project vAssist. Today, I will present you with a prototype that has been developed as part of this project.”

Informed consent: "Before we start, I'd like to ask you to sign a so-called informed consent to confirm your willingness to participate. Please take your time to read the whole document before you sign. If you have any questions regarding the informed consent, please do not hesitate to ask!"

Introduction: "Thank you very much! Your opinion and impression about this prototype is very important for us to adapt the system to the needs, wishes and requirements of the users. Specifically, we want to evaluate the system in an everyday life context. As this is still a prototype, it might happen that some error messages occur or that some functions do not work. Of course, we will offer support in case of any unexpected problems. I will come to that later again."

*Purpose: "*Within the vAssist project a voice controlled communication and care system is developed. The target group includes elderly people (65+) who suffer from (fine-) motor restrictions or chronic diseases. Services of the system are addressable via natural speech commands to compensate interaction issues that could arise from the mentioned constraints. In addition, older adults do not need to learn new interactions techniques. The vAssist system will be compatible with devices that already exist in the home environment, like Smartphones, PCs, TVs, etc."

Presentation of the smartphone: Show the smartphone to the participants

*Procedure: "*The workshop today consists of four parts. First, we will start with a demonstration of the prototype. I will show you the system and the respective functions you will get to use during the next two months. Afterwards, we will go on with training. We will form small groups and you will try out the system yourself. Next, we will continue with a description of your tasks during the field trial. You will receive all of this information also in written form, in our so-called handbook. As a final step, we will ask you to fill in some questionnaires. Are there any questions so far?"

Demonstration of the prototype

*Handbook: "*We will now hand out the handbook where you can find a description of the system, information regarding the project and contact information, a detailed description of your tasks during the field trials and so on. The handbook belongs to you. Feel free to underline or highlight text or to write something down!"

[Provide a presentation with screenshots for this part.]

DailyCare: "This is our DailyCare application. On the home screen you can see the main functions currently available: First, the sleep report which helps you monitoring your sleep behavior and the quality of your nights by just answering a few questions. Further, you can set reminders that will help you to remember to answer these questions and have a look at the past reports which are visualized. You can display the data for days, weeks, months and years.

The second function is the fitness report which helps you tracking your physical condition and activities also by answering a few questions. As with the sleep report, you can set reminders and see former reports as visual information. "

PillBox: This is the PillBox application. As you can see, it offers a prescription manager and medication reminder. We kindly ask you not to use this function because of ethical and security issues. Our system is still a prototype. Hence, the reminder might not work or information might be deleted and so on. Unfortunately, we cannot yet guarantee a perfectly working system.

For the field trial we will just test the health report. Here, you can track your blood sugar levels and blood pressure data. As with the DailyCare app, a reminder function and the visual report of the past data are provided."

Ambulatory Terminal: This is the Ambulatory terminal. As you can see, it's a very simple device. This button allows you to switch on/off the device. When you have switched on the device, just clip it on your belt. If a LED is flashing, the AT is not well adjusted on your belt. Just adjust the fit of the AT until the LED stops flashing. It's recommended to charge your AT every night. So, before going to bed, just plug in the adapter.

The big red button allows you to send an emergency call.
Warning: during the field trial, no emergency service is available with vAssist system. We will ask you to push the button in research purpose, but not in case of real emergency. For a real emergency, please contact traditional emergency services.

In addition, you could see this ear clip. Just plug it into the according location (it's written on the terminal). Then, you could place the clip on the bottom of your earlobe, like this (*demonstration*). To monitor the fit of pulse sensor, you have two LEDs: The first one is useful to estimate your pulse rate, and second one is dedicated to estimate "noise" of measure (i.e. errors during measurement). If this last one is flashing regularly, you have to adjust the position of the ear clip until the LED stops flashing.

During the Field Trial, we will ask you to wear the terminal as often as possible. Please note reasons which made you removing the terminal. In addition, one pulse rating measurement will be necessary per month. Your user guide indicates the respective dates. Finally, we will ask you to execute two emergency calls (experimental ones!) during the trial. There is no scheduled date for these tasks, we want you to perform emergency calls whenever you want, respecting random emergency situation.

DailyCom: "This is the DailyCom app which offers monitoring health and wellbeing of the user related data by using a smartphone via speech interaction. In addition, the application also serves as a communication tool. Hence, you can send SMS and call somebody just by asking the system to do so."

Training phase

Introduction: "For the training, we will form three small groups. This is to ensure that everybody has the opportunity to train the interaction with the system and that we can answer all of your questions regarding how to handle it."

- *DailyCare*:
  - sleep report via touch
  - sleep report via speech
  - fitness via touch
  - fitness via speech
- *PillBox:*
  - Health data via touch
  - blood pressure data via speech
- *Communication Services:*
  - Make a call to the small group leader

Tasks during the field trial

Introduction: "Now, I will explain what we want you to do during the field trial. First, I will explain the tasks with the system and afterwards I will address the questionnaires, interviews and diaries. Please note that the handbook contains all this information too and that you will be reminded of several tasks. If you have any questions, please ask them at any time. "

Interaction tasks:

- *DailyCare*: "Within the DailyCare application, we ask you to fill in the sleep report on a daily basis. This is not necessary for the fitness report, which you will fill in only in case you worked out or performed some kind of physical activity. For example: if you went for a walk or if you performed some gymnastics exercises. Please note, that we are not able to see your data because they are stored only on your phone during the field study. After the field trial, we will help you delete them to protect your privacy."
- *PillBox:* "Within the PillBox, we ask to report on your blood pressure every Sunday. Even though we cannot see the data you fill in (just as with the DailyCare application), we are aware that health data are really sensitive. For that reason we want you to fill in fake data, which you can find in the handbook for every week."
- *Communication Services:* "For the evaluation of the communication services, we ask you to call [name of the contact person] once a week on a defined day which you can find in your handbook to have a short conversation with [name of the contact person]. In addition, reminders for several tasks will be sent via the communication service. Please note that you don't have to reply. They just serve as support for you and enable that you get to know the text messages too. Are there any questions?"

- *DailyCom app*: „For evaluating the DailyCom app we ask you to fill in the questionnaires from a minimum of one per week to a maximum of one per day. Please note, that the secondary users are able to access your data via the web application of the DailyCom"

Questionnaires: "There will be different questionnaires we ask you to fill in. Important: please stick to the respective day as this allows us to more accurately compare our analysis between the questionnaires. You can find an overview, the exact dates and the questionnaires themselves in your handbook. All questionnaires need to be filled in once a month. For example, the so-called UEQ and the NASA-TLX, will be filled in on [day and date] and the second one, the so-called SASSI on [day and date]. We will send you a reminder to help you not to forget it. "

Qualitative Methods:

- *Critical Incidents Technique*: "The following diary is called the "Critical Incidents Diary". Critical incidents are any incidents that are of significance to you. They could be either positive, e.g. because they cause pleasure, or negative, for example because you are annoyed. Please report all such critical incidents that are related to the vAssist system right after they occur. We would kindly ask you to report at least three incidents within a period of two weeks. Of course, you can report more if a lot of critical incidents happen."
- *Day Reconstruction Method and SAM*: "The next method is a method that helps you to report your usage of the system. First, you start to reconstruct your day dividing it into episodes like scenes in a film. Give each episode a brief name that will help you remember it (for example, "commuting to work", or "at lunch with B", where B is a person or a group of people). Write down the approximate times at which each episode began and ended. Try to remember each episode in detail, and write a few words that will remind you of exactly what was going on. Also, try to remember what you did with the vAssist system, and how you felt during each episode. This diary packet is only for you, to help you remember and describe what happened during the first half of yesterday. It is yours to keep, so your notes are strictly personal and confidential.
  Afterwards, we ask you to report all episodes related to the vAssist system. It is important that we get to hear as much details as possible. First, you will describe the situation with as many details as possible. In addition, we would like you to fill in a short questionnaire. "
- *Qualitative Telephone interviews*: "Every other week I will call you for a telephone interview and ask you about your opinion and experience. If you are not able to answer the call, I will call you later. Hence, there is no need to call me back."

Questionnaires

"Now, we would like you to fill in some questionnaires. Please mark with an "X" the answers that correspond best." (Hand out the questionnaires regarding the user factors, the modified TAM3 and the WHOQOL)

End of the workshop

> "Thanks again for participating! We are looking forward to your feedback! Please remember, if you have any questions or concerns, do not hesitate to contact us. You can find the telephone number in your handbook!"

Field trial

The following section describes the tasks and data generation during the field trial.

Tasks

In Austria and France the PillBox application, the DailyCare Application and the communication services will be tested. In addition, France will include the Ambulatory Terminal. The DailyCom application will be evaluated in Italy.

In the study handbook which is handed out monthly, all tasks are described.

DailyCare (Austria and France)

The sleep report has to be filled in daily. This is not necessary for the fitness report, which you will fill in only in case you worked out or performed some kind of physical activity. In contrast, the fitness data report is not necessary if no specific physical activity was performed. To ensure that they do not forget the fitness reporting, a reminder will be send via the communication services once a week.

PillBox (Austria and France)

Due to ethical and security issues, the medication reminder will not be tested within the field trials. As the functionality of the blood pressure monitoring and the blood sugar level monitoring is the same, the blood pressure monitoring will be preferred to avoid a too high workload for the participants. The input of the blood pressure data will be conducted once a week based on defined fictitious data to respect the privacy regarding the participants' health data.

Communication Services (Austria and France)

To evaluate the communication services, participants are asked to call a defined contact person once a week. These calls also serve as a data collection method. To experience the communication services in a passive way, in addition to actively calling someone, the reminder for the fitness report will be given via the communication services.

Ambulatory Terminal (France)

During the Field Trial, users are asked you to wear the device as often as possible. Two pulse rating measurements will be executed on defined days. In addition, two emergency calls are simulated during the field study. To simulate a more realistic situation, users were instructed to choose a day and time on their own.

.

DailyCom (Italy)

Due to ethical and security issues, the fall detection service will not be tested during the field trail. The main task regarding the AT will consist of wearing the device as most as possible during the trial, i.e. ideal use of this kind of device. Participants who will test the AT have to report sit-down/lay down position during the day in DRM questionnaires, assuming they are standing up during others activities. The goal is to test quality of the activity detection. The DailyCom app has been developed to allow primary users to be assisted at home, using only their smartphones (with a centralized communication channel) and interacting in the most natural way possible (via a speech interface). In this way, the primary users can fill vocally questionnaires, providing the necessary data to monitor the state of health and the comfort in their home environment. The primary users will be asked to fill in the questionnaires from a minimum of one per week to a maximum of one per day.

The DailyCom app also offers , always through the speech interface, the ability of using a messaging service to send SMS and email, interacting with other vAssist app (Daly Care and PillBox) or invoking other system services (Agenda, calculator, route calculation, search on the internet).

DailyCom web app (Italy)

The web application, which can be accessed by the secondary users, has been implemented to allow secondary users to manage templates and questionnaires. Specifically for template management, users have the ability to create, edit and delete the templates which are the basis of the questionnaires provided via the DailyCom app. With the questionnaire management function, secondary users have the ability to view, search, and save the questionnaires produced by primary users.

During the field trial, the secondary users constantly monitor the patients proper filling the questionnaires.

In some cases, noticing some abnormal or unclear responses, they contact by phone the patients for a check and, according to the single case, schedule a visit for further investigation.

In addition, concerned participants will have to execute a pulse rate measure once per month, after the health report. This task requires wearing the pulse rating sensor during two hours at least (plugged ear clip), without stopping daily activities.

Finally, each participant will have to activate the emergency button twice during the trial period, without specific date/time indication. This task will not be planned as other tasks, in order to be closer as possible to real life conditions (emergency cannot be planned). Alert SMS will be received by then main investigator of the French trial.

Data generation

The following table shows the survey period per questionnaire and the qualitative methods during the field trial.

Table 10: Time plan and methods

Questionnaires/ Methods	Workshop	Week of the field trial							
		1	2	3	4	5	6	7	8
User factors	x								
Task: Telephone call		x	x	x	x	x	x	x	x
SAM		x	x	x	x	x	x	x	x
TAM3	x								x
UEQ			x				x		
SASSI				x				x	
NASA-TLX			x				x		
WHOQOL	x								x
Business model and economic aspects									x
Qualitative methods	x	x	x	x	x	x	x	x	x

This time plan was followed in Austria and in France. In order not to overwhelm the Italian participants belonging to the primary user group, the questionnaires were reduced. Just short forms of the UEQ, SASSI [13] and TAM3 were used. To quantify the feedback of the secondary users, they had to complete UEQ and the SASSI [13].

Qualitative data generation

- Critical Incidents Technique

With the Critical Incidents Technique [10] the users are asked to report specific events related to the vAssist system, either positive or negative, and describe them in detail. Critical incidents are defined as following:

> "By an incident is meant any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act. To be critical, an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects." [10]

This method allows getting a deeper understanding of what is important and surprising, i.e. what he or she expects the system to do or be. Because older adults could have some mild cognitive impairments and this method is sensitive to memory issues, the participants will be equipped with a diary, which s/he fills out whenever a critical incident happens. Nevertheless, participants are encouraged to report at least three incidents within two weeks. In addition, gentle reminders ensure that they do not forget to report them.

- Day Reconstruction Method (DRM)

With the Day Reconstruction Method (DRM) [17] the usage of the system and its rating are captured. In detail, users have to complete a "guided" reporting of all activities and events related to the system. They are instructed to fill in the printed form on a basis of an artificial week to avoid an overload of questionnaires and to ensure a variety of reported data. Hence, in the first week, they conduct the DRM on a Monday, in the second week on a Tuesday, in the third week on a Wednesday, and so on. After listing all of their activities and events, the participants are asked to fill in the Self-Assessment Manikin (SAM) to give a deeper understanding of their experience and to cover the affective assessment on a non-verbal scale. In addition, they are free to add free text comments. This method enables a faster analysis of the usage behavior of the participants. In addition, combined with log data, the reports show what the users think, what they are doing and the kind of understanding of the system they have or, using the words of a constructivist, which kind of usage reality they construct.

- Task: telephone call

Every week, participants are asked to use the vAssist communication service and to call a defined contact person. In the course of this call, the participants are asked in an informal way how they are, if they like the study and the system etc. To ensure an ethical adequate research strategy, participants are asked if the contact person is allowed to note the given information and to use it for the analysis.

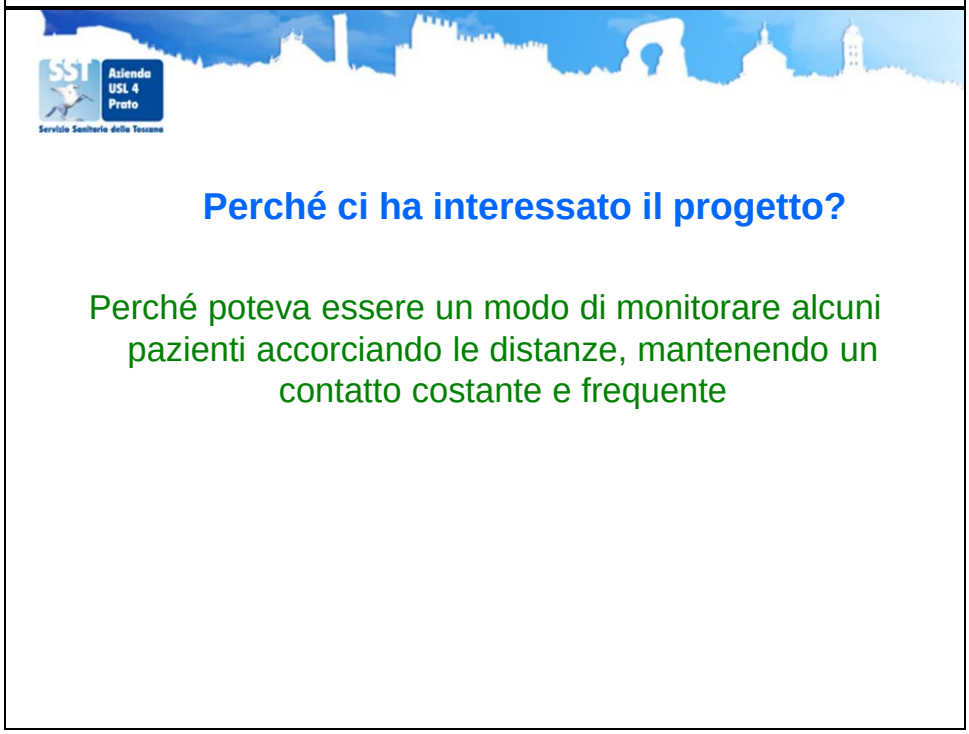
- Qualitative Interviews

Every other week semi-structured telephone interviews are conducted.

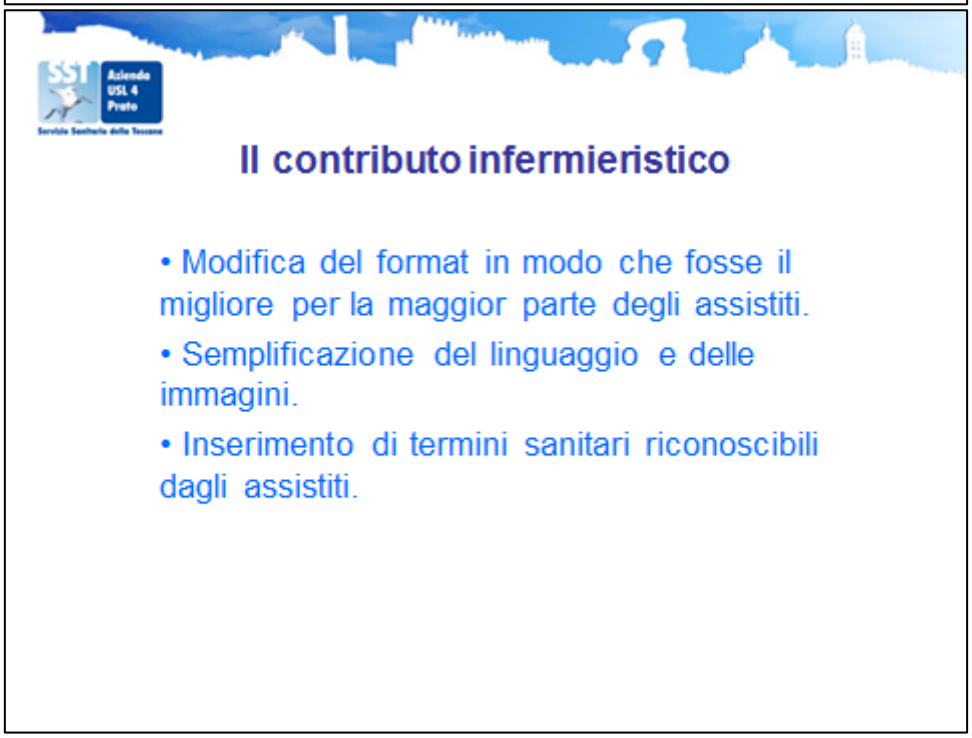
Debriefing and post interview

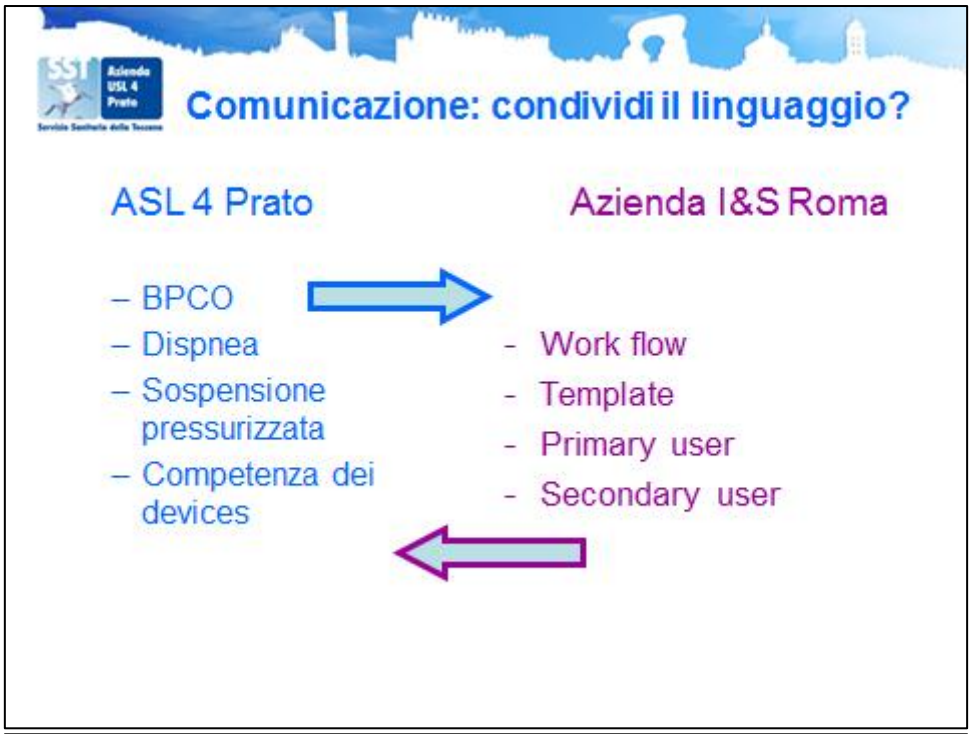
At the end of the field trial, a problem-centered Interview (PCI) with the focus on the experience during the field trial will take place. The PCI has an open narrative phase and a semi-structured phase combining the advantages of both methods and minimizing their limits [23].

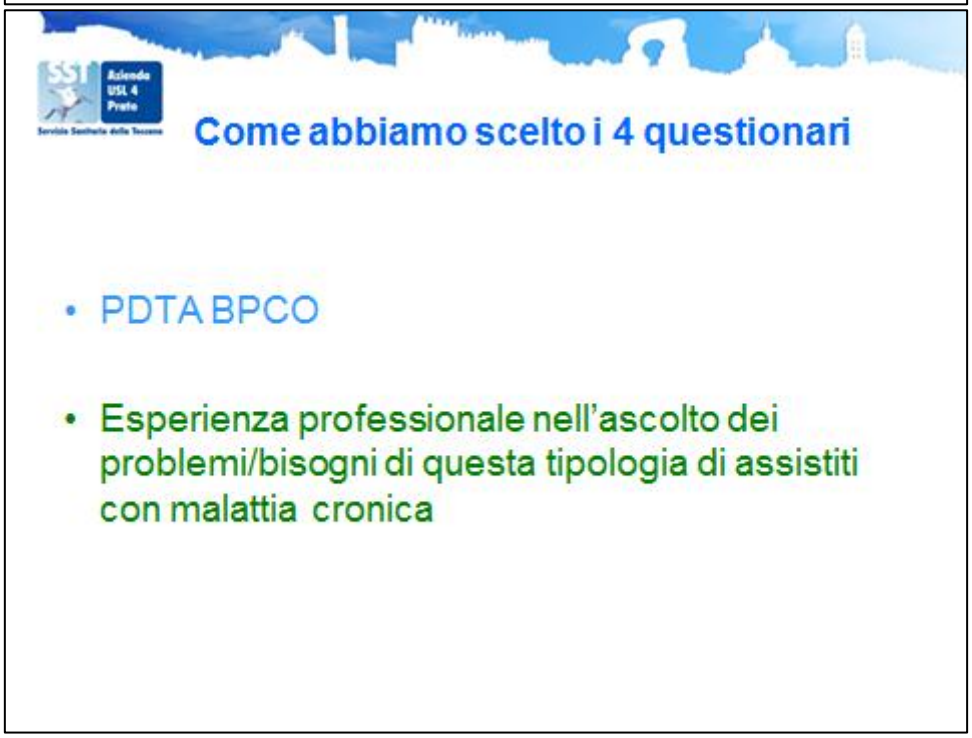
ANNEX D: Project demonstration Italy



Come ci siamo organizzati per lavorare al progetto
Dopo un primo periodo in cui abbiamo familiarizzato col nuovo dispositivo, abbiamo pensato al tempo e al luogo dove lavorare con metodo alla costruzione dei questionari.
• Nei mesi di Gennaio e Febbraio abbiamo dedicato un'ora tutti i venerdì. Nel mese di Marzo è stata aggiunta un'ora il lunedì.
• La sede individuata è stata quella degli ambulatori della Sanità di Iniziativa di V.le Montegrappa.
• Dopo una prima fase di ricerca in autonomia abbiamo concordato con la I&S una consulenza telefonica prima settimanale, poi bisettimanale in modalità viva voce, per collaborare in tempo reale alla costruzione delle flow-shart e dei questionari.


Il contributo infermieristico
• Modifica del format in modo che fosse il migliore per la maggior parte degli assistiti.
• Semplificazione del linguaggio e delle immagini.
• Inserimento di termini sanitari riconoscibili dagli assistiti.


Comunicazione: condividi il linguaggio?
ASL 4 Prato
Azienda I&S Roma
– BPCO
– Dispnea
– Sospensione pressurizzata
– Competenza dei devices
- Work flow
- Template
- Primary user
- Secondary user


Come abbiamo scelto i 4 questionari
• PDTA BPCO
• Esperienza professionale nell'ascolto dei problemi/bisogni di questa tipologia di assistiti con malattia cronica

I questionari

- Utilizzo della Scala MMRC per la dispnea

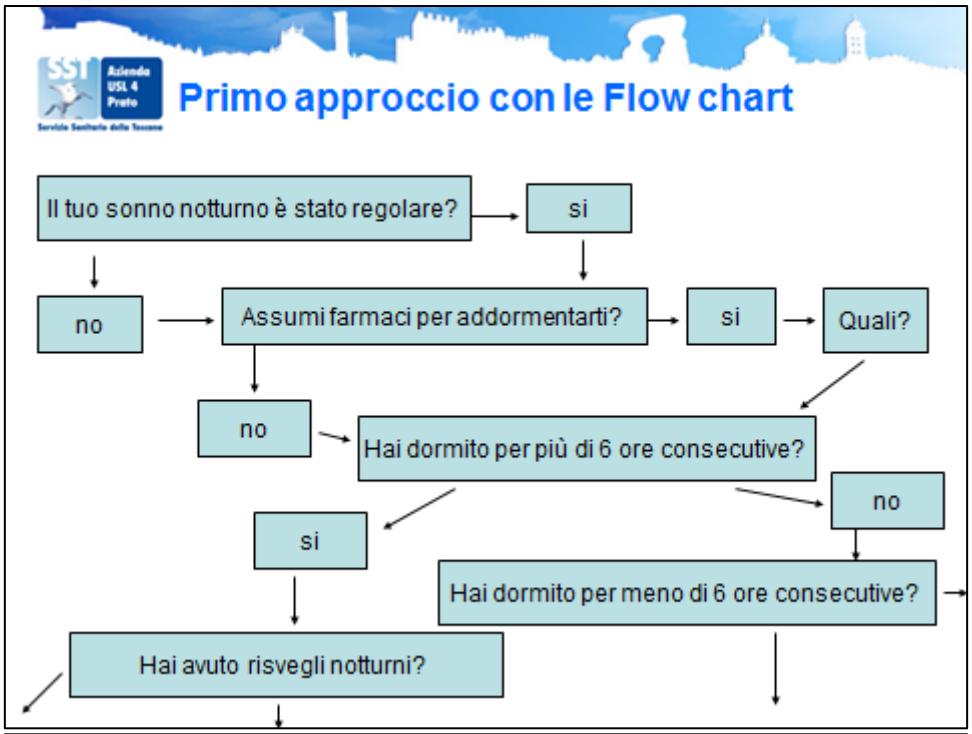
- Attività Fisica

- Sonno e Riposo

- Gestione Terapia

Siamo arrivati alla creazione dei questionari attraverso:

- Brainstorming e ragionamento con flow-chart
- Mettendosi "nei panni di"
- Simulando



Trasformazione in questionario

Questionario vAssist Qualità del sonno			
numero	domanda	si	no
1	Il tuo sonno notturno è stato regolare?	2	2
2	Assumi farmaci per addormentarti?	3	4
3	Quali?	4	4
4	Hai dormito per più di 6 ore consecutive?	6	5
5	Hai dormito per meno di 6 ore consecutive?	6	6
6	Hai avuto risvegli notturni?	7	14
7	Perché hai avuto tosse?	8	8
8	Perché hai avuto dispnea?	11	9
9	Per urinare?	12	10
10	Perché?	12	12
11	Se hai avuto più di quattro risvegli notturni contatta l'infermiera/e (alert)	12	12
12	Dopo l'interruzione del sonno ti riaddormenti subito?	14	13
13	Cosa fai?	14	14

Conclusioni

- Esperienza professionale interessante
- Tentativo di trasformazione originale di quella che è la documentazione infermieristica
- Tentativo di estendere l'intervento di educazione sanitaria con paziente attivo e proattivo già iniziato in ambulatorio
- Desiderio di iniziare con gli assistiti un processo di attenzione e cure che si incontrano in ambulatorio partendo dal loro domicilio

ANNEX E: Questionnaires

AttrakDiff

Please tell your impression about vAssist with the help of the following pairs of words:

PQ (Pragmatic Quality)								
technical	O	O	O	O	O	O	O	human
complicated	O	O	O	O	O	O	O	simple
impractical	O	O	O	O	O	O	O	practical
cumbersome	O	O	O	O	O	O	O	straightforward
unpredictable	O	O	O	O	O	O	O	predictable
confusing	O	O	O	O	O	O	O	clearly structured
unruly	O	O	O	O	O	O	O	manageable
HQ-I (Hedonic Quality- Identity)								
isolating	O	O	O	O	O	O	O	connective
unprofessional	O	O	O	O	O	O	O	professional
tacky	O	O	O	O	O	O	O	stylish
cheap	O	O	O	O	O	O	O	premium
alienating	O	O	O	O	O	O	O	integrating
separates me from people	O	O	O	O	O	O	O	bring me closer to people
unpresentable	O	O	O	O	O	O	O	presentable
HQ-S (Hedonic Quality - Stimulation)								
conventional	O	O	O	O	O	O	O	inventive
unimaginative	O	O	O	O	O	O	O	creative
cautious	O	O	O	O	O	O	O	bold
conservative	O	O	O	O	O	O	O	innovative
dull	O	O	O	O	O	O	O	captivating
undemanding	O	O	O	O	O	O	O	challenging
ordinary	O	O	O	O	O	O	O	novel
ATT (Attraktiviness)								
unpleasant	O	O	O	O	O	O	O	pleasant
ugly	O	O	O	O	O	O	O	attractive
disagreeable	O	O	O	O	O	O	O	likeable

rejecting	O	O	O	O	O	O	O	inviting
bad	O	O	O	O	O	O	O	good
repelling	O	O	O	O	O	O	O	appealing
discouraging	O	O	O	O	O	O	O	motivating

SUS

	Strongly disagree				Strongly agree
1. I think that I would like to use this system frequently	1	2	3	4	5
2. I found the system unnecessarily complex	1	2	3	4	5
3. I thought the system was easy to use	1	2	3	4	5
4. I think that I would need the support of a technical person to be able to use this system	1	2	3	4	5
5. I found the various functions in this system were well integrated	1	2	3	4	5
6. I thought there was too much inconsistency in this system	1	2	3	4	5
7. I would imagine that most people would learn to use this system very quickly	1	2	3	4	5
8. I found the system very cumbersome to use	1	2	3	4	5
9. I felt very confident using the system	1	2	3	4	5
10. I needed to learn a lot of things before I could get going with this system	1	2	3	4	5

Intui

Please describe your user experience with the help of the following set of paired statements. Each of them represents opposite positions with different graduations.

During the use of vAssist …		
…I acted weel-thought-out	☐ ☐ ☐ ☐ ☐ ☐ ☐	…I acted spontanous
…I reached my goals only with effort	☐ ☐ ☐ ☐ ☐ ☐ ☐	…I reached my goals easily
…I acted automatically without thinking to much about the different steps	☐ ☐ ☐ ☐ ☐ ☐ ☐	…I consiously carried out one step after another
…I was led by my mind	☐ ☐ ☐ ☐ ☐ ☐ ☐	…I was led by my feelings
…I was without orientation	☐ ☐ ☐ ☐ ☐ ☐ ☐	…I could orientate very well
…I acted without thinking	☐ ☐ ☐ ☐ ☐ ☐ ☐	…I could reason every single step
The use of vAssist …		
…requested a lot of concentration	☐ ☐ ☐ ☐ ☐ ☐ ☐	…everything happened automatically
…was pleasant	☐ ☐ ☐ ☐ ☐ ☐ ☐	…was boring
…was easy	☐ ☐ ☐ ☐ ☐ ☐ ☐	…was difficult
…was nothing special	☐ ☐ ☐ ☐ ☐ ☐ ☐	…was a big experience
…was very intuitive	☐ ☐ ☐ ☐ ☐ ☐ ☐	…was not intuitive
…was unimportant	☐ ☐ ☐ ☐ ☐ ☐ ☐	…was inspiring
…was easy for me	☐ ☐ ☐ ☐ ☐ ☐ ☐	…was difficult for me
…was fascinating	☐ ☐ ☐ ☐ ☐ ☐ ☐	…was sad
Now afterwards …		
…it is difficult for me to describe the different operating steps	☐ ☐ ☐ ☐ ☐ ☐ ☐	…it is no problem for me to describe the different operating steps
…I easily can remember the different operating steps	☐ ☐ ☐ ☐ ☐ ☐ ☐	…it is difficult for me to remember how to use vAssist
…I can't explain how I used vAssist	☐ ☐ ☐ ☐ ☐ ☐ ☐	…I can precisly explain how I used vAssist

PSSUQ

Please describe your user experience with the help oft he following set of paired statements. Each of them represents opposite positions with different graduations.

During the use of vAssist								
…I acted weel-thought-out	☐	☐	☐	☐	☐	☐	☐	…I acted spontanous
…I reached my goals only with effort	☐	☐	☐	☐	☐	☐	☐	…I reached my goals easily
…I acted automatically without thinking to much about the different steps	☐	☐	☐	☐	☐	☐	☐	…I consiously carried out one step after another
…I was led by my mind	☐	☐	☐	☐	☐	☐	☐	…I was led by my feelings
…I was without orientation	☐	☐	☐	☐	☐	☐	☐	…I could orientate very well
…I acted without thinking	☐	☐	☐	☐	☐	☐	☐	…I could reason every single step
The use of vAssist								
…requested a lot of concentration	☐	☐	☐	☐	☐	☐	☐	…everything happened automatically
…was pleasant	☐	☐	☐	☐	☐	☐	☐	…was boring
…was easy	☐	☐	☐	☐	☐	☐	☐	…was difficult
…was nothing special	☐	☐	☐	☐	☐	☐	☐	…was a big experience
…was very intuitive	☐	☐	☐	☐	☐	☐	☐	…was not intuitive
…was unimportant	☐	☐	☐	☐	☐	☐	☐	…was inspiring
…was easy for me	☐	☐	☐	☐	☐	☐	☐	…was difficult for me
…was fascinating	☐	☐	☐	☐	☐	☐	☐	…was sad
Now afterwards…								
…it is difficult for me to describe the different operating steps	☐	☐	☐	☐	☐	☐	☐	…it is no problem form e to describe the different operating steps
…I easily can remember the different operating steps	☐	☐	☐	☐	☐	☐	☐	…it is difficult for me to remember how to use vAssist
…I can’t explain how I used vAssist	☐	☐	☐	☐	☐	☐	☐	…I can precisly explain how I used vAssist

Questionnaire on user factors

Please fill out the following questionnaire.

Your responses will be confidential. As with all data collected during the study, they will only be used within the vAssist project. Your responses in the vAssist field study are much appreciated and of great importance for the project and the further development of the vAssist services.

Please remember: there are no right or wrong answers, just answers that are true for you!

What is/was your profession?

_____
_____

Are you retired?

- ☐ Yes
- ☐ No

On a scale from 1 (not strong at all) to 5 (very strong), how would you describe your accent/dialect?

Not strong at all	☐	☐	☐	☐	☐	Very strong

What is your native language?

_____
_____

If [language] is <u>not</u> your native language, when did you learn it?

_____ years ago

Which hand is your preferred one?

- ☐ I'm right-handed
- ☐ I'm left-handed
- ☐ Both hands

Which of the following technological devices do you own?

- ☐ Feature Phone
- ☐ Smartphone
- ☐ Laptop/PC
- ☐ Tablet
- ☐ Navigation Device
- ☐ Other devices:_____

Which of the following health care devices do you own:

- ☐ Blood pressure gauge
- ☐ Blood glucose meters

What are you able to do with a mobile phone, Smartphone, Laptop/PC, and Tablet?

I know how to use the following functions on a mobile phone:

- ☐ Initiate a call via contact list
- ☐ Initiate a call via calling list
- ☐ Write an SMS
    - ☐ with automatic word recognition (T9)
    - ☐ without automatic word recognition (T9)
- ☐ Play games
- ☐ Listen to music on the mobile phone
- ☐ Load music on the mobile phone
- ☐ Change settings on the mobile phone according to my needs
- ☐ Other: _____

I know how to use the following functions on a Smartphone:

- ☐ Initiate a call via contact list
- ☐ Initiate a call via calling list
- ☐ Write an SMS using the App, WhatsApp or similar
- ☐ Send pictures via MMS, WhatsApp or similar
- ☐ Write and send an Email
- ☐ Use different Apps on my smartphone

- ☐ Search for new Apps and install them on my smartphone
- ☐ Take pictures
- ☐ Edit pictures on my smartphone
- ☐ Make a video with my smartphone
- ☐ Set the alarm clock on my smartphone
- ☐ Set reminders on my smartphone
- ☐ Create a note on my smartphone
- ☐ Use the weather forecast App
- ☐ Use the navigation App to find a route
- ☐ Listening to music on my smartphone
- ☐ Load music on my smartphone
- ☐ Surf the Internet
- ☐ Change settings on the smartphone according to my needs
- ☐ Other: _____

I know how to use the following functions on a Laptop/PC:

- ☐ Start and shut down the laptop/PC
- ☐ Play games
- ☐ Work with a word processing program like Microsoft Word, Office, Open Office
- ☐ Save documents on a specific hard drive location / directory, i.e., using the folder system (e.g. own documents, Desktop…)
- ☐ Print out documents
- ☐ Install programs from a CD-ROM to the Laptop/PC and open them
- ☐ Surf the Internet
- ☐ Download programs from the Internet to the Laptop/PC and open them
- ☐ Copy pictures from a camera to the Laptop/PC and open them
- ☐ Edit pictures
- ☐ Print out pictures
- ☐ Copy videos from a camera to the Laptop/PC and open them
- ☐ Edit videos
- ☐ Change settings on the laptop/PC according to my needs
- ☐ Other: _____

I know how to use the following functions on a tablet:

- ☐ Write and send messages
- ☐ Write and send emails
- ☐ Use different Apps on my tablet
- ☐ Search for new Apps and install them on my tablet

- ☐ Take pictures
- ☐ Edit pictures on my tablet
- ☐ Make a video with my tablet
- ☐ Set the alarm clock on my tablet
- ☐ Set reminders on my tablet
- ☐ Create a note on my tablet
- ☐ Use the weather forecast App
- ☐ Use the navigation App to find a route
- ☐ Listening to music on my tablet
- ☐ Load music on my tablet
- ☐ Surf the Internet
- ☐ Change settings on the tablet according to my needs
- ☐ Other:

  _____

Have you ever used speech input on a device?

- ☐ Yes
- ☐ No

If yes: Have you ever operated the following services on a device (smartphone, tablet, laptop/PC) via speech commands:

- ☐ Write an SMS
- ☐ Write an Email
- ☐ Initiate a Phone Call
- ☐ Search in the Internet (e.g. Google Voice, etc.)

Are there any physical restrictions that you have, which make it difficult for you to interact with touch screen devices? If so, which ones…?

- ☐ No
- ☐ Yes:

_____
_____

How do these physical restrictions influence your interaction with the following devices? Please describe some of the typical problems that you encounter.

With smartphones…?

_____

_____

With tablets…?

_____

_____

With other mobile devices…?

_____

_____

With PCs/laptops…?

_____

_____

I**n a typical month, how often do you see your doctor(s)? (**physical, face-to-face appointments)

- ☐ No appointments at all
- ☐ Less than one a month
- ☐ At least once a month
- ☐ Every other week
- ☐ Once a week
- ☐ More than once a week

How stressful is it for you to go to physical appointments?

Not stress-ful at all	☐	☐	☐	☐	☐	Very stressful

In your opinion, are there too many physical appointments?

No, not at all	☐	☐	☐	☐	☐	Yes, very much so

If it was possible, would you like to reduce the number of physical appointments with your doctor?

- ☐ Yes
- ☐ No

Do you wear glasses or contact lenses?

- ☐ No
- ☐ Yes, I am farsighted
  - ☐ Approximate diopter: _____
- ☐ Yes, I am shortsighted
  - ☐ Approximate diopter: _____
- ☐ Yes, I am farsighted on one eye and shortsighted on the other
  - ☐ Approximate diopter: _____
- ☐ Yes, other vision problem: _____

On a scale from 1 to 5, how would you rate your visual acuity?

Very bad ☐ ☐ ☐ ☐ ☐ Very good

Do you have a hearing aid?

- ☐ Yes
- ☐ No
- ☐ Other: _____

On a scale from 1 to 5, how would your rate your hearing (ability)?

Very bad ☐ ☐ ☐ ☐ ☐ Very good

Do you monitor your well-being in any manner? If yes: how?

_____
_____

_____
_____

Do you monitor your sleeping behavior in any manner? If yes: how?

_____
_____

_____
_____

Do you monitor your blood sugar level in any manner? If yes: how?

_____
_____

_____
_____

Do you monitor your blood pressure level in any manner? If yes: how?

_____
_____

_____
_____

Global Information Privacy Concerns (IUIPC subscale):

	I strongly disagree						I strongly agree
All things considered, the Internet causes serious problems with regard to my privacy.	O	O	O	O	O	O	O
Compared to others, I am more sensitive about the way companies and public authorities handle my personal information online.	O	O	O	O	O	O	O
To me, it is the most important thing to keep my privacy intact from companies and public authorities online.	O	O	O	O	O	O	O
I believe other people are too much concerned with online privacy issues.	O	O	O	O	O	O	O
Compared with other subjects on my mind, personal privacy is very important.	O	O	O	O	O	O	O
I am concerned about threats to my personal privacy nowadays.	O	O	O	O	O	O	O

		I strongly disagree	I disagree	I disagree somewhat	undecided /neutral	I agree somewhat	I agree	I strongly agree
PU1	I expect that using the vAssist Applications will improve my performance in my daily activities.	O	O	O	O	O	O	O
PU2	I expect that using the vAssist Applications will increase my productivity in my daily activities.	O	O	O	O	O	O	O
PU3	I expect that using the vAssist Applications will enhance my effectiveness in my daily activities.	O	O	O	O	O	O	O
PU4	I expect the vAssist Applications to be useful in my daily activities.	O	O	O	O	O	O	O
PE-OU1	I expect my interaction with the vAssist Applications to be clear and understandable.	O	O	O	O	O	O	O
PE-OU2	I expect interacting with the vAssist Applications will not require a lot of my mental effort.	O	O	O	O	O	O	O
PE-OU3	I expect the vAssist Applications to be easy to use.	O	O	O	O	O	O	O
PE-OU4	I expect it will be easy to get the vAssist Applications to do what I want them to do.	O	O	O	O	O	O	O
	I could complete my daily activities using a mobile application…							
CSE1	…if there was no-one around to tell me what to do as I go	O	O	O	O	O	O	O
CSE2	…if I just had the built-in help facility for assistance	O	O	O	O	O	O	O
CSE3	…if someone showed me how to do it first	O	O	O	O	O	O	O
CSE4	…if I had used similar applications before to perform the same activities.	O	O	O	O	O	O	O

		I strongly disagree	I disagree	I disagree somewhat	undecided /neutral	I agree somewhat	I agree	I strongly agree
PEC1	I expect that I will have control over using the vAssist Applications.	O	O	O	O	O	O	O
PEC2	I expect that I will have the resources necessary to use the vAssist Applications.	O	O	O	O	O	O	O
PEC3	Given the resources, opportunities and knowledge it takes to use the system, I expect, it would be easy for me to use the system	O	O	O	O	O	O	O
PEC4	I expect that the vAssist Applications will not be compatible with other systems I use.	O	O	O	O	O	O	O
	The following questions ask you how you would characterize yourself when you use computers.							
CPLAY 1	… spontaneous							
CPLAY 2	… creative	O	O	O	O	O	O	O
CPLAY 3	… playful	O	O	O	O	O	O	O
CPLAY 4	… unoriginal	O	O	O	O	O	O	O
CANX1	Computers do not scare me at all.	O	O	O	O	O	O	O
CANX2	Working with a computer makes me nervous.	O	O	O	O	O	O	O
CANX3	Computers make me feel uncomfortable.	O	O	O	O	O	O	O
CANX4	Computers make me feel uneasy.	O	O	O	O	O	O	O
ENJ1	I expect that using the vAssist Applications will be enjoyable.	O	O	O	O	O	O	O
ENJ2	I expect that the actual process of using the vAssist Applications will be pleasant.	O	O	O	O	O	O	O
ENJ3	I expect that I will have fun using the vAssist Applications.	O	O	O	O	O	O	O
BI1	Assuming I had access to the vAssist Applications, I intend to use them.	O	O	O	O	O	O	O
BI2	Given that I had access to the vAssist Applications, I predict that I would use them.	O	O	O	O	O	O	O

BI3	I plan to use the vAssist Applications when released.	O	O	O	O	O	O	O

Age: _____ years

Gender: _____

TAM3

		I strongly disagree	I disagree	I disagree somewhat	undecided /neutral	I agree somewhat	I agree	I strongly agree
PU1	Using the vAssist Applications improves my performance in my daily activities.	O	O	O	O	O	O	O
PU2	Using the vAssist Applications increases my productivity in my daily activities.	O	O	O	O	O	O	O
PU3	Using the vAssist Applications enhances my effectiveness in my daily activities.	O	O	O	O	O	O	O
PU4	I find the vAssist Applications to be useful in my daily activities.	O	O	O	O	O	O	O
PE-OU1	My interaction with the vAssist Applications is clear and understandable.	O	O	O	O	O	O	O
PE-OU2	Interacting with the vAssist Applications does not require a lot of my mental effort.	O	O	O	O	O	O	O
PE-OU3	I find the vAssist Applications to be easy to use.	O	O	O	O	O	O	O
PE-OU4	I find it easy to get the vAssist Applications to do what I want them to do.	O	O	O	O	O	O	O
	I could complete my daily activities using a mobile application…							
CSE1	…if there was no-one around to tell me what to do as I go	O	O	O	O	O	O	O
CSE2	…if I just had the built-in help facility for assistance	O	O	O	O	O	O	O
CSE3	…if someone showed me how to do it first	O	O	O	O	O	O	O
CSE4	…if I had used similar applications before to perform the same activities.	O	O	O	O	O	O	O
		I strongly	I disagree	I disagree	undecided	I agree	I agree	I strongly

		disagree		somewhat	/neutral	somewhat		agree
PEC1	I have control over using the vAssist Applications.	O	O	O	O	O	O	O
PEC2	I have the resources necessary to use the vAssist Applications.	O	O	O	O	O	O	O
	Given the resources, opportunities and knowledge it takes to use the system, it would be easy for me to use the system	O	O	O	O	O	O	O
PEC4	The vAssist Applications are not compatible with other systems I use.	O	O	O	O	O	O	O
	The following questions ask you how you would characterize yourself when you use computers.							
CPLAY 1	… spontaneous	O	O	O	O	O	O	O
CPLAY 2	… creative	O	O	O	O	O	O	O
CPLAY 3	… playful	O	O	O	O	O	O	O
CPLAY 4	… unoriginal	O	O	O	O	O	O	O
CANX1	Computers do not scare me at all.	O	O	O	O	O	O	O
CANX2	Working with a computer makes me nervous.	O	O	O	O	O	O	O
CANX3	Computers make me feel uncomfortable.	O	O	O	O	O	O	O
CANX4	Computers make me feel uneasy.	O	O	O	O	O	O	O
ENJ1	I find using the vAssist Applications to be enjoyable.	O	O	O	O	O	O	O
ENJ2	The actual process of using the vAssist Applications is pleasant.	O	O	O	O	O	O	O
ENJ3	I have fun using the vAssist Applications.	O	O	O	O	O	O	O
BI1	Assuming I had access to the vAssist Applications, I intend to use them.	O	O	O	O	O	O	O
BI2	Given that I had access to the vAssist Applications, I predict that I would use them.	O	O	O	O	O	O	O
BI3	I plan to use the vAssist Applications in the next months (when released).	O	O	O	O	O	O	O

UEQ

Please make your evaluation now.

For the assessment of the product, please fill out the following questionnaire. The questionnaire consists of pairs of contrasting attributes that may apply to the product. The circles between the attributes represent gradations between the opposites. You can express your agreement with the attributes by ticking the circle that most closely reflects your impression.

Example:

attractive	○	⊗	○	○	○	○	○	unattractive

This response would mean that you rate the application as more attractive than unattractive.

Please decide spontaneously. Don't think too long about your decision to make sure that you convey your original impression.

Sometimes you may not be completely sure about your agreement with a particular attribute or you may find that the attribute does not apply completely to the particular product. Nevertheless, please tick a circle in every line.

It is your personal opinion that counts. Please remember: there is no wrong or right answer!

Please assess the product now by ticking one circle per line.

	1	2	3	4	5	6	7		
annoying	○	○	○	○	○	○	○	enjoyable	1
not understandable	○	○	○	○	○	○	○	understandable	2
creative	○	○	○	○	○	○	○	dull	3
easy to learn	○	○	○	○	○	○	○	difficult to learn	4
valuable	○	○	○	○	○	○	○	inferior	5
boring	○	○	○	○	○	○	○	exciting	6
not interesting	○	○	○	○	○	○	○	interesting	7
unpredictable	○	○	○	○	○	○	○	predictable	8
fast	○	○	○	○	○	○	○	slow	9
inventive	○	○	○	○	○	○	○	conventional	10
obstructive	○	○	○	○	○	○	○	supportive	11
good	○	○	○	○	○	○	○	bad	12
complicated	○	○	○	○	○	○	○	easy	13
unlikable	○	○	○	○	○	○	○	pleasing	14
usual	○	○	○	○	○	○	○	leading edge	15
unpleasant	○	○	○	○	○	○	○	pleasant	16
secure	○	○	○	○	○	○	○	not secure	17
motivating	○	○	○	○	○	○	○	demotivating	18
meets expectations	○	○	○	○	○	○	○	does not meet expectations	19
inefficient	○	○	○	○	○	○	○	efficient	20
clear	○	○	○	○	○	○	○	confusing	21
impractical	○	○	○	○	○	○	○	practical	22
organized	○	○	○	○	○	○	○	cluttered	23
attractive	○	○	○	○	○	○	○	unattractive	24
friendly	○	○	○	○	○	○	○	unfriendly	25
conservative	○	○	○	○	○	○	○	innovative	26

SASSI

System response accuracy	Strongly disagree	disagree	Rather disagree	neutral	Rather agree	agree	Strongly agree
The system is accurate							
The system is unreliable							
The interaction with the system is unpredictable							
The system didn't always do what I wanted							
The system didn't always do what I expected							
The system is dependable							
The system makes few errors							
The interaction with the system is consistent							
The interaction with the system is efficient							

Likeability	Strongly disagree	disagree	Rather disagree	neutral	Rather agree	agree	Strongly agree
The system is useful							
The system is pleasant							
The system is friendly							

I was able to recover easily from errors							
I enjoyed using the system							
It is clear how to speak to the system							
It is easy to learn to use the system							
I would use this system							
I felt in control of the interac-tion with the system							

Cognitive de-mand	Strongly disagree	disagree	Rather disagree	neutral	Rather agree	agree	Strongly agree
I felt condent using the system							
I felt tense using the system							
I felt calm using the system							
high level of concentration is required when using the system							
The system is easy to use							

Annoyance	Strongly disagree	disagree	Rather disagree	neutral	Rather agree	agree	Strongly agree
The interaction with the system is repetitive							

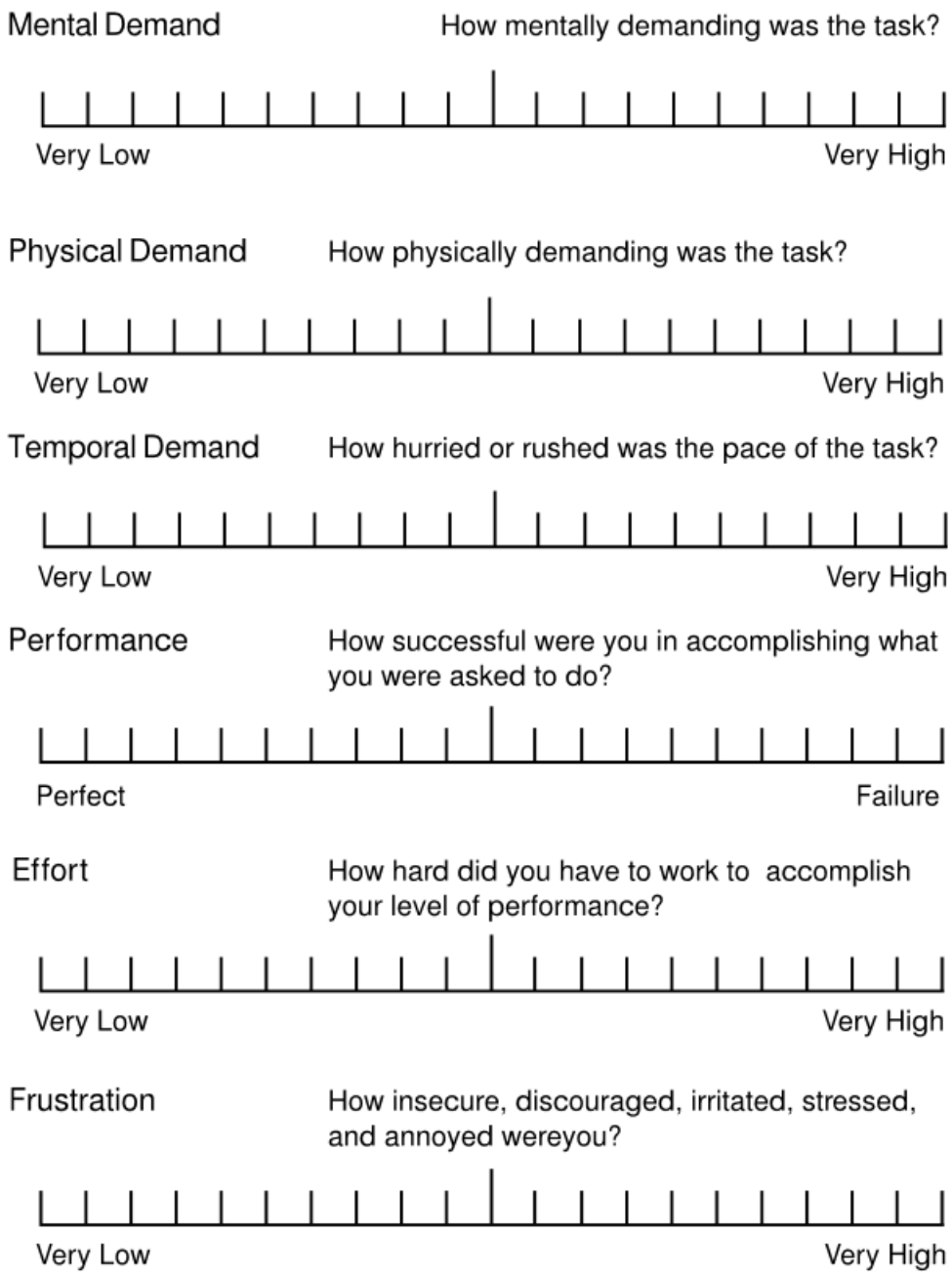
The interaction with the system is boring							
The interaction with the system is irritating							
The interaction with the system is frustrating							
The system is too inflexible							

Habitability	Strongly disagree	disagree	Rather disagree	neutral	Rather agree	agree	Strongly agree
I sometimes wondered if I was using the right word							
I always knew what to say to the system							
I was not always sure what the system was doing							
It is easy to lose track of where you are in an interaction with the system							

Speed	Strongly disagree	disagree	Rather disagree	neutral	Rather agree	agree	Strongly agree
The interaction with the system is fast							
The system responds too slowly							

NASA-TLX

Please place an “X” along each scale at the point that best indicates your experience with the vAssist Applications.



WHOQOL-BREF

WHOQOL-BREF

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. **Please choose the answer that appears most appropriate.** If you are unsure about which response to give to a question, the first response you think of is often the best one.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last four weeks.**

		Very poor	Poor	Neither poor nor good	Good	Very good
1.	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2.	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last four weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3.	To what extent do you feel that physical pain prevents you from doing what you need to do?	5	4	3	2	1
4.	How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5.	How much do you enjoy life?	1	2	3	4	5
6.	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
7.	How well are you able to concentrate?	1	2	3	4	5
8.	How safe do you feel in your daily life?	1	2	3	4	5
9.	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about how completely you experience or were able to do certain things in the last four weeks.

		Not at all	A little	Moderately	Mostly	Completely
10.	Do you have enough energy for everyday life?	1	2	3	4	5
11.	Are you able to accept your bodily appearance?	1	2	3	4	5
12.	Have you enough money to meet your needs?	1	2	3	4	5
13.	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14.	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor	Poor	Neither poor nor good	Good	Very good
15.	How well are you able to get around?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16.	How satisfied are you with your sleep?	1	2	3	4	5
17.	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18.	How satisfied are you with your capacity for work?	1	2	3	4	5
19.	How satisfied are you with yourself?	1	2	3	4	5

20.	How satisfied are you with your personal relationships?	1	2	3	4	5
21.	How satisfied are you with your sex life?	1	2	3	4	5
22.	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23.	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24.	How satisfied are you with your access to health services?	1	2	3	4	5
25.	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to how often you have felt or experienced certain things in the last four weeks.

		Never	Seldom	Quite often	Very often	Always
26.	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	5	4	3	2	1

Do you have any comments about the assessment?

_____

_____

Questionnaire on business aspects

1. What do you think, who will be the main end users (thus the main target group) of the vAssist services? (Please choose all relevant target groups)

- ☐ Active older adults who use the services on their own
- ☐ Seniors with marginal need for support
- ☐ Persons in need of care who use the system together with other persons (e.g. relatives or care persons)
- ☐ Employees of mobile care providers
- ☐ Employees of institutional care providers (e.g. retirement homes or hospitals)
- ☐ Persons with physical impairments
- ☐ Persons with cognitive impairments
- ☐ Persons with high technology affinity (i.e. persons who “like” technology and the usage of new technologies)
- ☐ Persons with a higher purchasing power compared to the average
- ☐ Other: _____

2. Are you seeing yourself as part of any of these groups? (Please choose all relevant groups)

- ☐ Active older adults who use the services on their own
- ☐ Seniors with marginal need for support
- ☐ Persons in need of care who use the system together with other persons (e.g. relatives or care persons)
- ☐ Employees of mobile care providers
- ☐ Employees of institutional care providers (e.g. retirement homes or hospitals)
- ☐ Persons with physical impairments
- ☐ Persons with cognitive impairments
- ☐ Persons with high technology affinity (i.e. persons who “like” technology and the usage of new technologies)
- ☐ Persons with a higher purchasing power compared to the average

3. Do you use a system which is similar to the vAssist system?

- ☐ No
- ☐ Yes

Which one? _____

Who provides it? _____

4. Do you own a device similar to the devices needed for the vAssist system?

- ☐ No
- ☐ Yes

Which one? _____

Who provides it? _____

5. How important are the costs for your decision whether you would purchase the vAssist system or not?

Not at all important ☐ ☐ ☐ ☐ ☐ Very important

6. Which payment model would you prefer? (Please select only one answer)

- ☐ Single-Payment: The full fee of the vAssist services will be purchased when the contract is concluded. Updates may require additional fees.
- ☐ Pay-Per Use: vAssist services will be paid when used, i.e. usage-based fees will be charged.
- ☐ Flat Rate: vAssist services will be delivered as a monthly/annual usage-independent flat rate fee
- ☐ Try and Buy: vAssist services will be delivered for a period of six months without any fee and after this period one of the models mentioned above will be applied:
  - ☐ Single-Payment
  - ☐ Pay-Per Use
  - ☐ Flat Rate
- ☐ Other: _____

7. How would you like to get the hardware (e.g. smartphone, smart TV etc.) for the vAssist services?

- ☐ I would prefer to rent the hardware via the vAssist platform.
- ☐ I would prefer to buy the hardware via the vAssist platform.
- ☐ I would prefer to use my own hardware/ buy the hardware on my own.

*The following questions target your opinion regarding the price **per month** of the vAssist system (Pill-Box, DailyCare and Communication Services). Please note that the respective hardware is excluded.*

8. At what monthly rate do you think the vAssist system is priced so low that it makes you question its quality?

_____ €

9. At what monthly rate do you think the vAssist service is a bargain?

_____ €

10. At what monthly rate do you think the vAssist system begins to seem expensive?

_____ €

11. At what monthly rate do you think the vAssist system is too expensive?

_____ €

ANNEX F: Templates for qualitative self-reported data

Critical Incidents Technique

The following diary is called the “Critical Incidents Diary”. Critical incidents are any incidents that are of significance to you. They could be either positive, e.g. because they cause pleasure, or negative, for example because you are annoyed.

Please report all such critical incidents that are related to the vAssist system right after they occur. We would kindly ask you to report at least three incidents within a period of two weeks. Of course, you can report more if a lot of critical incidents happen.

Date: _____ Time: _____

Detailed description of the critical incident:

(For example: What happened? Where were you? How did you feel during the incident? Was it a positive or negative incident? Why? …)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Why is it a critical incident for you?

(Why is the incident of significance to you?)

_____

_____

_____

_____

Day Reconstruction Method

Yesterday

We would like to learn what you did with the vAssist system and how you felt yesterday.

Because many people find it difficult to remember what exactly they did and experienced, we will do this in three steps:

1. On the next page, we will ask you when you woke up and when you went to sleep yesterday.
2. We'd like you to reconstruct what your day was like, as if you were writing in your diary. Where were you? What did you do and experience? How did you feel? Answering the questions on the next page will help you to reconstruct your day.

   This diary packet is only for you, to help you remember and describe what happened yesterday. It is yours to keep, so your notes are strictly personal and confidential. You do not need to turn it in. Nobody will read what you jot down about your day.

3. After you have finished reconstructing your day in your diary, we will ask you specific questions about this time. In answering these questions, we'd like you to consult your diary page and the notes you made to remind you of what you did and how you felt.

Diary Pages

About what time did you wake up yesterday? _____

And when did you go to sleep? _____

On the next three pages, please describe your day. Think of your day as a continuous series of scenes or episodes in a film. Give each episode a brief name that will help you remember it (for example, “commuting to work”, or “at lunch with B”, where B is a person or a group of people). Write down the approximate times at which each episode began and ended. The episodes people identify usually last between 15 minutes and 2 hours. Indications of the end of an episode might be going to a different location, ending one activity and starting another, or a change in the people you are interacting with.

There is one page for each part of the day – Morning (from waking up until noon), Afternoon (from noon to 6:00 pm) and Evening (from 6:00 pm until you went to bed). There is room to list 10 episodes for each part of the day, although you may not need that many, depending on your day. It is not necessary to fill up all of the spaces – use the breakdown of your day that makes the most sense to you and best captures what you did and how you felt.

Try to remember each episode in detail, and write a few words that will remind you of exactly what was going on. Also, try to remember what you did with the vAssist system, and how you felt during each episode. What you write only has to make sense to you, and to help you remember what happened when you are answering the questions in the next step.

> *Remember, what you write in your diary will not be seen by anybody else. This part is yours to keep if you wish – you don’t have to turn it in with the rest of your questionnaire.*

Morning

(from waking up until just before lunch)

Episode Name	Time it began	Time it ended	Note to yourself: What happened? What did you do with the vAssist system? What did you feel?
1M			
2M			
3M			
4M			
5M			
6M			
7M			
8M			
9M			
10M			

Afternoon

(from lunch until just before dinner)

Episode Name	Time it began	Time it ended	Note to yourself: What happened? What did you do with the vAssist system? What did you feel?
1A			
2A			
3A			
4A			
5A			
6A			
7A			
8A			
9A			
10A			

Evening

(from dinnertime until just before you went to sleep)

Episode Name	Time it began	Time it ended	Note to yourself: What happened? What did you do with the vAssist system? What did you feel?
1E			
2E			
3E			
4E			
5E			
6E			
7E			
8E			
9E			
10E			

Please look over your diary once more. Are there any other episodes that you'd like to revise or add more notes to? Is there an episode that you would want to break up into two parts? If so, please go back and make the necessary adjustments on your diary pages. If not, you may go on.

What did you do yesterday?

Before we proceed, please look back at your diary pages.

How many episodes did you record for the Morning? _____

How many episodes did you record for the Afternoon? _____

How many episodes did you record for the Evening? _____

Now, we would like to learn in more detail about what you did and how you felt during those episodes. For each episode, there are several questions. Please use the notes on your diary pages as often as you need to.

You just have to answer the questions for episodes related to the vAssist system usage. Please answer the questions for every episode you recorded, beginning with the first episode when you used the system. To make it easier to keep track, we will ask you to write down the number of the episode that is at the end of the line where you wrote about it in your diary. For example, the first episode of the Morning was number 1M, the third episode of the Afternoon was number 3A, the second episode of the Evening was number 2E, and so forth.

It is very important that we get to hear in detail about all relevant episodes you experienced yesterday, so please be sure to answer the questions for these episodes you recorded as detailed as possible.

Episode

Please look at your Diary and select the earliest episode with the vAssist system you noted.

When did this first episode begin and end (e.g., 7:30am)? Please try to remember the times as precisely as you can.

This is episode number _____, which began at _____ and ended at _____.

Please, describe the situation with as many details as possible:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Which application were you using? (please check all that apply)

- ☐ DailyCare app
- ☐ PillBox app

What were you doing? (please check all that apply)

- ☐ Sleep report:
  - ☐ Create a new report
  - ☐ Set a reminder
  - ☐ Consult past reports
- ☐ Fitness Report

- ☐ Create a new report
- ☐ Set a reminder
- ☐ Consult past reports

☐ Health data

- ☐ Enter blood sugar level and blood pressure
- ☐ Set a reminder
- ☐ Consult past reports

☐ Other:

_____

_____

Where were you?

_____

Where you alone?

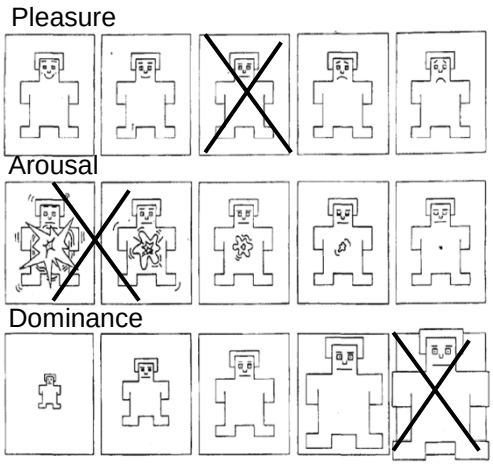
☐ Yes

☐ No, I was with close friends/ relatives

☐ No, acquaintances were around me

☐ No, strangers were around me

Filling out „SAM“, an example:



Please mark in each row the figure that best corresponds to your emotional state. It is also possible to make a cross between two SAMs. The crosses set, have the following meaning e.g.:

- The use of the system provides moderate *pleasure*.
- The use of the system provides very high levels of *arousal*.
- The system strongly *dominates* the user.

Pleasure indicates: from being happy to unhappy, from being pleased to annoyed, from being satisfied to unsatisfied, from being contented to melancholic, from being hopeful to despairing, from being relaxed to bored

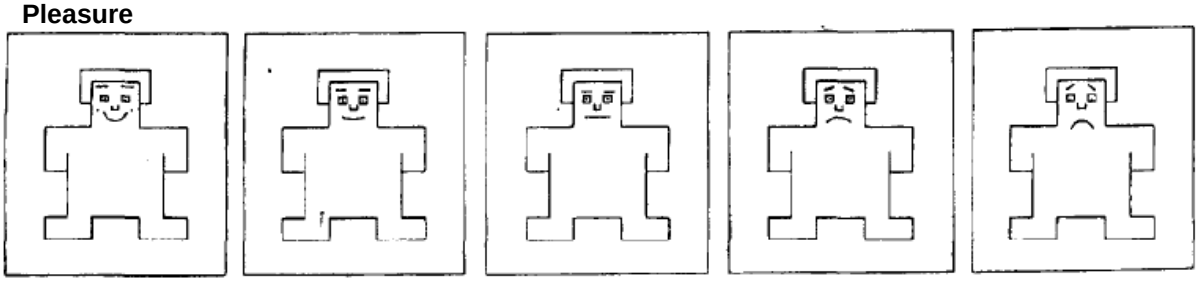
Arousal indicates: from being stimulated to relaxed, from being excited to calm, from being frenzied to sluggish, from being jittery to dull, from being wideawake to sleepy, from being aroused to unaroused

Dominance indicates: from being controlling to be controlled, from being influential to influenced, from being in control to being cared for, from being important to awed, from being dominant to submissive, from being autonomous to guided

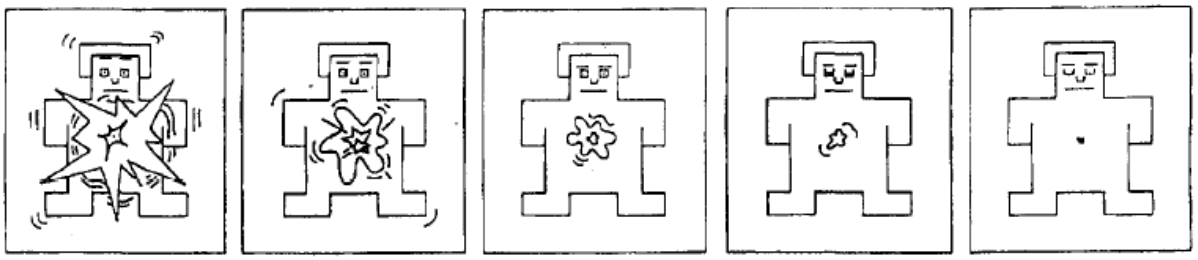
Please mark the “SAM-figures” according to your emotional status. Please place an ‘x’ over any of the five figures or between any two figures that match your feelings of pleasure, arousal and dominance.

How do you feel regarding the described activities with the system?

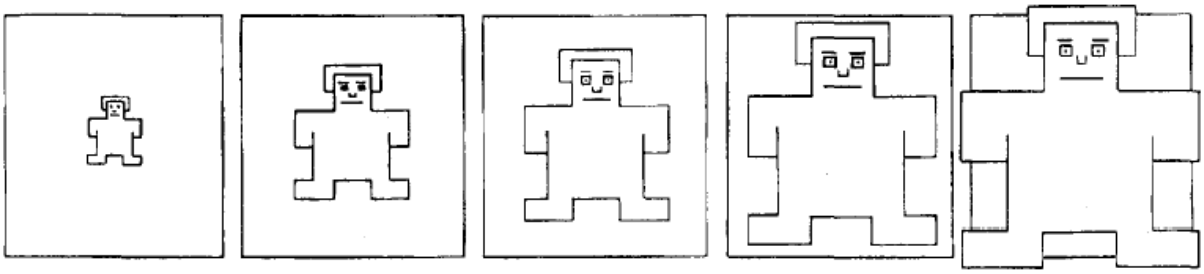
Pleasure



Arousal



Dominance



ANNEX G: Interview guide (Field Trial)

Telephone interviews (Austria):

1st interview:

(1) Please describe your first impression of the vAssist system? What do you think about the system?

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) How would you describe your learning progress regarding the handling of the system?

(5) What do you think would change if the system would support speech interaction?

2nd interview:

(6) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(7) Which (additional) aspects of the system do you experience as problematic?

(8) Which (additional) aspects of the system do you experience as very positive?

(9) If you were the developer of the system, what else would you add to the applications?

3rd interview:

(1) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) Where do you see the potential of the system when it is available on the market?

(5) In how far do you think it could enhance e.g. the health management and/or the quality of life of the future users?

4th interview:

(1) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) Now, that speech interaction is available, what has changed regarding your experience during the interaction?

5th interview:

(1) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) What do you prefer? Speech interaction or touch interaction? Why?

6th interview:

(1) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) In your experience, what influences your choice if you choose speech or touch interaction?

7th interview:

(1) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) What are the positive and negative aspects of speech interaction compared to touch interaction?

Telephone interviews (France)

1st interview:

(1) Please describe your first impression of the vAssist system? What do you think about the system?

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) How would you describe your learning progress regarding the handling of the system?

(5) What do you think would change if the system would support speech interaction?

(6) How do you deal with wearing Ambulatory Terminal?

2nd interview:

(1) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) If you were the developer of the system, what else would you add to the applications?

3rd interview:

(1) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) Where do you see the potential of the system when it is available on the market?

(5) In how far do you think it could enhance e.g. the health management and/or the quality of life of the future users?

(6) How do you deal with wearing Ambulatory Terminal? And with pulse monitoring?

4th interview:

(1) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) Now, that speech interaction is available, what has changed regarding your experience during the interaction?

5th interview:

(1) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) What do you prefer? Speech interaction or touch interaction? Why?

(5) How do you deal with wearing Ambulatory Terminal?

6th interview:

(1) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) In your experience, what influences your choice if you choose speech or touch interaction?

7th interview:

(1) How was your last week with the system? [encourage the participant to express his/her experience without structuring it]

(2) Which (additional) aspects of the system do you experience as problematic?

(3) Which (additional) aspects of the system do you experience as very positive?

(4) What are the positive and negative aspects of speech interaction compared to touch interaction?

(5) How do you deal with wearing Ambulatory Terminal and with pulse monitoring?

(6) Would you keep the Ambulatory Terminal if it would be available?

Problem-centered interview

(1) Introduction:

"First of all, thanks for attending our last interview and participating in our field trial in general. As you know, we honestly appreciate your feedback which is an important part of our project. My name is_____ and I will conduct this interview with you.

Before we start I would like to ask if it is ok for you that we record this interview for documentation purposes. Recording would allow that I can focus on our conversation. *[Wait for allowance]*

Thanks a lot. Your opinion and impression about this prototype is very important for us to adapt the system to the needs, requirements and wishes of future users. Nevertheless, we will handle information regarding you as a person strictly confidential and I will not take notes regarding information which allows your identification – just as we handled it during the field phase.

As you might now, I was not actively part of the field study because my colleague [Name] undertook the support and organization during the trial. So, I am interested in all of your experiences with the vAssist system because we never had contact during that phase in person. The following interview consists of two parts. First, it is your turn. You can freely tell me, what happened, what was important to you or whatever comes to your mind regarding the usage of the system and I will just listen to you. Secondly, I will ask questions for example if I am not sure if I understood correctly. For that purpose I would like to make some notes if that is ok for you*? [Wait for allowance]"*

(2) Main Narration

"Thanks! Now, I would like to ask you to tell me about your time with the system. Please, just start with the beginning of the field study. What was your first impression? How did that developed over the time?"

> *[Please note that is extremely important that you do not interrupt the participants. Also avoid saying "yes", nodding etc. too often as participants tend to think that you already know what they are going to say and they stop explaining. Instead, use active listening techniques (positive but unobtrusive body language which encourages the participants to continue telling their story). If the participant stops talking, us the last words of the interviewee formed to a question (E.g. Interviewee: "…and I really did not like that" Interviewer: "You did not like that?") Remember: Your time to ask questions is coming later!*

"Is there anything else you want to add?"

(3) Questioning Phase

- *[First, ask questions of understanding regarding the free narration if necessary]*

[The following questions should not be asked if they were part of the narration phase and already answered sufficiently. Ask the questions in an appropriate order according to the participant's answers]

- "To sum up the previous narration, how would you describe the typical usage situations?"
- "And how would you sum up the development over the time?"
- "What do you think, under which circumstances would you (in person) use the system?"
- "What would be your concerns about such a technology?"

"Now, I would ask you to complete the following tasks which were part of the field trial via speech interaction. After finishing, please tell me everything what comes to you mind what you liked or what you want the developers to change. First, we start with the sleep report"

"Great! So, what did you like? And what should be changed?"

"Now, we change to the PillBox application. I would ask you to enter the following blood pressure and blood sugar values:" *[provide a handout with the values]*

BLOOD SUGAR	BLOOD PRESURE
110 mg/dl	135mmHG / 90 mmHG

"Thanks a lot! As a last task, I would ask you to add a new prescription to the medication reminder. As you might remember, we did not test this function because the vAssist system is still a prototype and therefore, errors occur and a reminder might not be sent. Hence, we did not want to take that risk. Here, you can see the details of your new prescription:" *[provide a handout with the values]*

One Aspirin per day in the morning starting tomorrow

"Thanks a lot!"

- "In general, what do you think about speech interaction?"
- "What do you think are the advantages of touch interaction compared to speech interaction?"
- "What do you think are the advantages of speech interaction compared to touch interaction?"
- "Do you think it would be enough to offer just one of those interaction modalities? Why?"
- "Could you imagine a situation when you would never use speech interaction for the interaction with the vAssist system? Which one?"
    - "Could you explain why you would prefer another interaction modality?"
    - "Which way of interaction would you prefer?" [If help is needed: "for example touch or something completely different or new? What could that be?"]

- "Is there anything else you want to add or comment on?"

[hand out the following questionnaire:

1. *UEQ*
2. *Questionnaire on business aspects*
3. *TAM3*
4. *WHOQOL-Bref]*

ANNEX H: Informed consent

Title of the Project:	vAssist - Voice Controlled Assistive Care and Communication Services for the Home
Website:	http://vassist.cure.at
Coordinator:	Univ. Prof.Dr. Manfred Tscheligi, AIT Austrian Institute of Technology GmbH, Giefinggasse 2, 1210 Vienna, Austria
Leading Local Investigator:	Markus Garschall
Institution:	AIT Austrian Institute of Technology GmbH
Financed by:	EC, BMVIT, FFG, ANR
Programme:	AAL Joint Programme (AAL JP) http://www.aal-europe.eu/
Call:	Call 3 - ICT-based Solutions for Advancement of Older Persons' Independence and Participation in the "Self-Serve Society"
Project Number:	AAL-2010-3-106
Project Type:	Cooperative Project
Project Duration:	36 Months
Project Start - End:	1 December 2011 – 30 November 2014

The study described in this document is part of the research project *"vAssist - Voice Controlled Assistive Care and Communication Services for the Home".* The European Union (EU) and the BMVIT on behalf of the FFG finance this project under the AAL Joint Programme (Project number: AAL-2010-3-106).

This informed consent document may include words that you may not understand. If that is the case, please ask the contact researcher or any other staff of the study to fully explain the meaning of the word or piece of information you do not understand. You may take a copy of this consent to think about it or talk to your family before making any decision. At all times, we assure the compliance of the current legislation.

I. INTRODUCTION

You have been invited to take part in a research study of the *vAssist* project. Before making a decision on whether you want to participate or not, please read this document carefully. Please ask all the questions you may have so you can be completely sure that you understand the scope and procedure of the study, including risks and benefits.

II. PURPOSE OF THE STUDY/PROJECT

The general objective of the *vAssist* project is to provide voice controlled Home Care and Communication Services for two target groups of older persons (chronic diseases; fine-motor skill restrictions). The main goal is the development of simplified and adapted interface variants for tele-medical and communication applications using multilingual natural voice interaction and supportive graphical user interfaces.

III. PARTICIPANTS IN THE STUDY AND POSSIBLE PARTICIPATION

We kindly request your voluntary participation in this research study. This informed consent includes information on the following research study. We would like to assure that you are perfectly informed about the purpose of the study and what your participation in it implies.

Please ask to clarify any section in this informed consent document you do not understand. Please, do not sign if you are not sure that you have understood all the aspects of the study and its objectives.

The participation in this study is totally voluntary. You can give up at any moment without being penalized.

The criteria for participating in this study are as following:

- Being an older person (> 65 years) suffering from a chronic disease or fine-motor skill restrictions
- Being a family member or caregiver of an older person (> 65 years) suffering from a chronic disease or fine-motor skill restrictions
- Being a health professional caring for an older person (> 65 years) suffering from a chronic disease or fine-motor skill restrictions

Only in Austria: At the end of the study you will receive a financial compensation depending on your time spent and your valuable input in the amount of 20 to 80 EUR.

IV. PROCEEDINGS:

Within the *vAssist* project users of the above defined target groups will be invited to requirements, lab and field trial studies of the developed system prototypes. Within these studies users will have the chance to give information on requirements, needs and wishes in early project phases. In further project phases users have the chance to try the prototypes (lab trials, field trials) and give feedback concerning usability and user experience that will be used to refine and optimize the system. Participants will have to perform specific tasks related to the prototype as well as to answer questionnaires and interviews regarding user experience and usability aspects of the system. Lab studies will be audio and video recorded for backup and analysis reasons. Field trials will include diverse log-file recordings.

Place of the Study:

- Austria: CURE Experience Labs/ AIT Experience Labs
- France: Premises of APHP

Duration of the Study:

- Focus Groups / Requirements Phase: ~ 2 hours
- Lab Trials / Usability Evaluation: ~ 1,5 hours

V. RISKS OR INCONVENIENT

No risks are foreseen. You are only requested to be available to participate in the study.

VI. BENEFITS

The personal benefit from participating in any study of the *vAssist* project is that you can make a substantial contribution to the development of future technologies focusing on the enhancement of the quality of life of older persons and supporting an independent life-style. In any case, the data collected in this study will lead to a deeper and better knowledge and understanding of the wishes and needs of older persons and their carers as well as their social environment to enhance future voice controlled tele-medical and communication services.

VII. PRIVACY AND CONFIDENCIALITY

Your registered and/or recorded responses will not include any personal identification information. Hence, it will not be possible to identify you after your participation in any study. Recorded information will be processed during the phase of data analysis and will be included in project internal reports or later in scientific publications. It will not be possible to identify the source of the information, observing at all times:

Austria: The „Bundesgesetz über den Schutz personenbezogener Daten (Datenschutzgesetz 2000 - DSG 2000)"

> "According to the law aforementioned, we inform you that all provided personal data that will be scientifically analysed will be coded from AIT so that it will not be possible to identify your name or other personal information about you in the results of the scientific analysis. All provided personal data will be stored in a file store that can only be accessed by partners that are active involved in the *vAssist* project. None of the provided personal data will be handled out to third parties."

The results of this study may be published in scientific magazines, conference proceedings or books. Complete anonymity of personal data is guaranteed by the *vAssist* partners.

The authorization for the use and access to this information with study purposes is completely voluntary. This authorization is valid until the end of the study unless you decide to cancel it before. If you should decide to deny your consent, please contact the leading investigator and let her/him know of your intention of leaving the study.

You can contact the leading investigator at the following address:

Markus Garschall

AIT Austrian Institute of Technology GmbH

Giefinggasse 2

1210 Vienna

Austria

+43 50550-4536

Markus.Garschall@ait.ac.at

From the moment you withdraw from the *vAssist* project, your data will not be used in any further phase of the project. However, documents that have already been published or are parts of the study that have been finished will not be able to be altered.

Your decision to whether or not give your authorization for the use and diffusion of the information provided by you is completely voluntary. However, if you do not provide us with your authorization now or if you cancel it in the future, you will not be able to participate in this study.

VIII. CONTACT PERSONS

For further information about your rights as a participant in the investigation, or if you are not satisfied with the way this study is being carried out, or if you have any question or complaint during the investigation, please contact the leading investigator:

Markus Garschall

AIT Austrian Institute of Technology GmbH

Giefinggasse 2

1210 Vienna

Austria

+43 50550-4536

Markus.Garschall@ait.ac.at

IX. CONFIRMATION

Your participation in this study is only possible if you freely and independently sign this informed consent document to authorize us to use the data you provide. If you do not wish to do so, please do not subscribe and do not participate in this study.

I have read the information in this informed consent document or the information has been read to me in an adequate way. All of my questions about the study and my participation in it have been answered.

Mark one of the following with an X:

__I read all the information in this form.

__The information in this informed consent was read to me by:……..

All the questions that I had have been answered by:……

I authorize the use and analysis of my answers to the entity aforementioned for the purposes above indicated. Signing this informed consent does not imply giving up to any legal rights. I accept in a voluntary way to participate in this investigation carried out by AIT and the rest of the partners of the *vAssist* Project. I understand that I have the right of having a copy of this informed consent. Therefore, a copy will be provided to me.

Name and surname of the participant:

……

Date:

……

Signature of the participant

……

Name and surname of the researcher

……

Date:

……

Signature of the researcher:

……

X. PHOTO, VIDEO AND AUDIO RECORDING

The study is led by:

Markus Garschall

AIT Austrian Institute of Technology GmbH

Giefinggasse 2

1210 Vienna

Austria

+43 50550-4536

Markus.Garschall@ait.ac.at

As part of this research project, photograph, videotape and audiotape recordings during the participation in the study will be done.

I have received a thorough description of the purpose and procedures for any recordings and I give my consent to allow AIT use the recordings or parts of the recordings for analysis, related studies and project results, as well as for marketing and PR purposes of *vAssist.* I understand that all information will be kept confidential and will be reported in an anonymous way.

Name and surname of the participant:

……

Date:

……

Signature of the participant

……

Name and surname of the researcher

……

Date:

……

Signature of the researcher

……