ICT-2009-248730

Florence

Multi Purpose Mobile Robot for Ambient Assisted Living

STREP
Contract Nr: 248730

Deliverable: D1.3 Final robot based service scenarios

Due date of deliverable: (31-01-2011)
Actual submission date: (31-01-2011)

Start date of Project: 01 February 2010 Duration: 36 months

Responsible WP: TECNALIA

Revision: accepted

Project co-funded by the European Commission within the Seventh Framework Programme (2007-2013)		
Dissemination level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Service	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (excluding the Commission Services)	

0 DOCUMENT INFO

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0.2 Documents history

Document version #	Date	Change
V0.1	07-06-10	Starting version, template
V0.2	19-07-10	Definition of ToC
V0.3	22-12-10	First complete draft
V0.4	04-01-11	Integrated version (send to WP members)
V0.5	10-01-11	Updated version (send to project internal reviewers)
Sign off	26-01-11	Signed off version (for approval to PMT members)
V1.0	31-01-11	Approved Version to be submitted to EU

0.3 Document data

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Delivery date	31-01-2011

0.4 Distribution list

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1 Introduction

This deliverable, D1.3 Final robot based service scenarios, is provided in WP1 as a result of work carried out in Task 1.2 Definition of Robotic service scenarios. This task is responsible for defining scenarios for the Florence services. These scenarios must be realistic in terms of money, flexibility of the care-process/home/user, the change of habit required, expected acceptance, inherit restrictions, and the additional side actions required like extra monitoring services. This is based on the requirements defined in Task 1.1, and the initial architectural ideas about robots in smart environments defined in WP2. Work in D1.3 is a continuation from D1.1 Initial robot based service scenarios.

The main aim of this deliverable is to provide a selection of key service scenarios as specified in the first project milestone (MS1). All partners are involved in defining which scenarios the Florence project and the Florence system should be designed for. Focus groups methodology as well as results is also outlined in D1.3.

In this deliverable, the progress from first use case definition after the focus groups session to the final use cases to be implemented can be followed.

In order to answer the concerns related to robustness and scenario expansion from the European Commission stated in the previous M6 review, several actions were carried out:

- Variants or *alternative paths* as well as *system error* or *exceptions* are considered within the use cases templates. This will help provide higher robustness in the foreseen services.
- Additional functionalities for the chosen scenarios are analyzed for future scenario expansion (section 4 of all scenario descriptions).

2 Scenario and use case definition process

Once D1.1 was delivered, the second stage of T1.2 followed with discussion and focus groups to better understand how the involved actors understand, interpret and perceive what is being offered in a scenario.

Feedback from focus/discussion groups helped refine the scenarios and define the first set of use cases for each scenario (version A). A specific feasibility check run by WP2, WP3 and WP4 will guarantee the proposed scenarios are feasible within the Florence project and exploiting the different key features of all development work packages. These reviewed use cases will lead to a version B prior to Wizard of Oz tests. The possibility of interacting with the service at such an early stage of the project, will help in redefining the scenario and use cases that are basis for the future services (version C), improving acceptance of the end system.

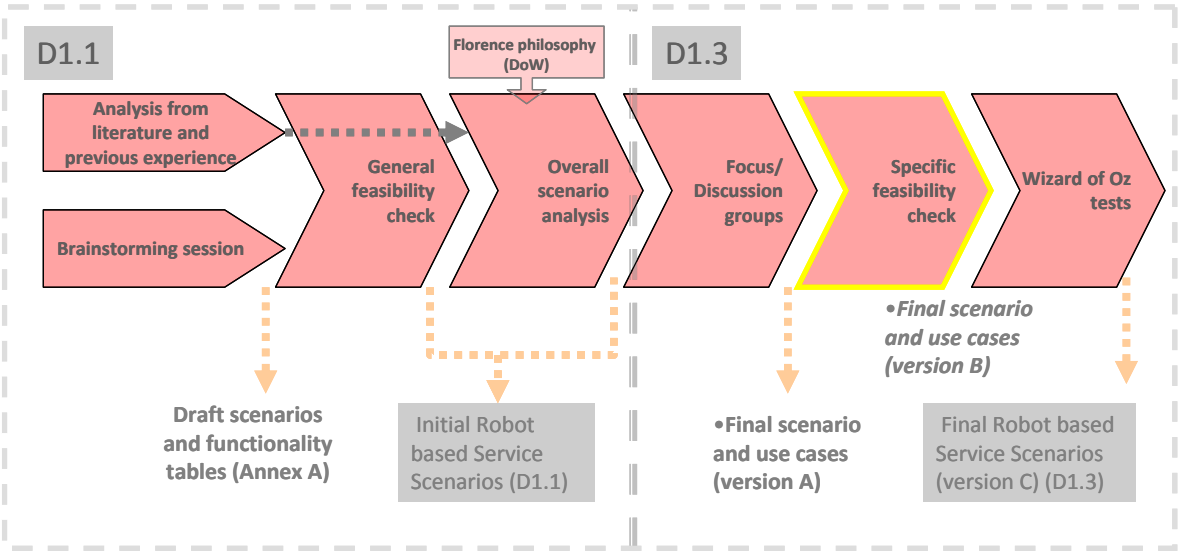

Table 1. Scenario and use case definition process

In order to support further expansion of the eight scenarios the Wizard of Oz tests were seen as opportunities to analyze generic, mainly interaction based aspects and sub-aspects. Aspects explored in the Wizard of Oz will be illustrated within a scenario context for the users to be able to better comprehend which task they are trying to execute. However, the hypothesis is that in some cases the feedback obtained may well serve many scenarios. More information about the Wizard of Oz tests can be found in deliverable D1.4.

Feedback from the WoOz tests will lead to final version C of the scenarios and use cases. WP5 will be working in parallel with the same set of use cases to convert the scenarios into service designs. The described process is illustrated in Table 1

Scenario and use case definition and templates used in Florence can be found in ANNEX A: Scenario and use case elaboration.

3 FOCUS GROUPS

Florence project's WP1 included work on focus groups to reshape and redefine if necessary the different proposed scenarios. In this section the applied methodology as well as results is described.

3.1 Focus groups methodology

Focus Groups are a recurrent qualitative method to collect data applied in a wide variety of research from Market Research to Public Opinion Making. Focus Groups build up multidimensional discourses around a topic, enhancing contradictions, mistakes and speech behaviours within a holistic and group framework.

In this case we used focus groups in order to test the use cases selected for the Florence system in three different sites (Spain, Netherlands and Germany). Therefore we divided the session into four discussions each on a selected aspect, with 25 minutes per discussion and a break of 15 minutes after the second one.

Two different focus groups were made with different target groups. For the first one we selected experienced professionals tele-assistant and/or informal or formal caregivers with years of daily contact with users (later in the document referred to as Prof.). In this way we got a grasp of the elderly's needs from the hands of professionals. The second focus group was made from end users, repeating the use case analysis.

The procedure of the two focus groups was the following:

- Welcoming and presentations of each participant
- Presentation of the project and the meaning of the focus group
- Reading and signing the consent form
- Presentation of each use case and discussion (25 minutes each)

Apart from the moderator there were two researchers taking notes around the different aspects of each use case. The moderator was careful not to over interrupt but aware of the need to guide the conversation back to the topic when necessary.

Focus groups were held in the following locations and dates:

- Thursday, November 4, 2010, 9:30-12:30 at Novay, in Enschede, the Netherlands.
- Monday, September 13, 2010, 10.00-12.00 at OFFIS, Oldenburg, Germany
- Wednesday, November 03, 2010, 10.00-12.00 at Hoertech Centre, Oldenburg, Germany
- Thursday, November 04, 2010, 10.00-12.00 at OFFIS, Oldenburg, Germany
- Monday, September 6,2010, 10:30-13:30 at FASS (telecare), in Seville, Spain (Prof.)
- Monday, September 13, 2010, 10:30-13:30 at FASS (telecare), in Seville, Spain.(Users)

3.2 Feedback and comments from focus groups

In the following tables comments from the different scenarios are outlined. User expectations and feeling on the key points addressed in D1.1 as well as general comments can be found in the Table 2.

In order to take into account cultural background when needed each comment is followed by [ES] (Spain), [NL] (Netherlands) and [DE] (Germany).

SCENARIO	COMMENTS from FOCUS GROUPS	ACTIONS to be done
KEETOU-Keeping in touch	1. It was thought that a robot is not able to detect someone's mood in a reliable way, and should not perform any actions based on its judgment without consulting the participant [NL] 2. Participants don't like the robot to indicate to friends/relatives that it is a good time for getting in touch: they prefer to keep the initiative [NL] 3. It is nice to get alerts for new messages, photo's etc. from friends and/or relatives [NL] 4. The robot should not approach people and present messages etc. from others, but motivate people to get up from the chair [NL] 5. It is OK that others use the robot as a tele-presence tool [NL]	To address comments 1 and 2, we propose the following two-pronged approach: (1) Keep track of **amount of visits:** How many visits did the parent have in the near past and how many visits are expected in the near future: this could be derived from some agenda and from measuring the number of visits. (2) Measure the following mood-related aspects and make them accessible to the children such that the children can decide for themselves whether this is good moment to virtually visit grandma: stress levels (if available), low-activity levels, sleep patterns. The approach will be to provide raw data instead of a judgement over this data whether it is a good or bad moment for a visit, leaving it up to a significant other to decide with the data provided.
HOMINT-Home interface	1. If you leave the home, you don't want to have a list of forgotten things, you want just a notice that something (unknown) is missing (training effect) [DE] The more assistance the people have, the more skills they will unlearn (different for people with disabilities)[DE] Audio-visual bell: very good (increased security), no permanent following of the robot[DE] Window-open-tips etc.: good, ventilation important for heathy living[DE] Smoke detector, oven on, gas etc.: very good, infrared camera for small flame on cooker[DE] 2. Keep unread events on the screen until noticed [DE] 3. Open the door if the key is lost [DE] 4. Have loudspeakers on other floors if robot can't climb stairs [DE] 5. Control TV: good [DE] 6. How to learn new functions? [DE] 7. Check if oven is turned on: very good,	Think about ways to integrate infrared cameras to detect heat and fire and warn about those. Think about integration of smoke detectors.

	really important [DE]	
FALHAN- Fall handling	1. (Users)Wearing a bracelet to be noticed might be a problem. They would prefer if it is a sticker. [ES] 2. (Prof)The system will be very useful for dependent users. [ES] 3. (Prof) The need of a safety providing service, will make users accept giving more of their privacy away. [ES] // Observation is no big problem – the benefit is worth it[DE] // Who can't live with observation won't buy a robot[DE] 4. (Prof)The inclusion of a camera in the scenario should be optional. [ES] 5. The telecare should be the first to handle the emergencies due to its neutrality. [ES] 6. (Prof) Users should have the choice of deactivating the emergency in case of a false alarm. [ES] 7. (Users) Houses with stairs and gardens should be taken into account [ES] // Robot should be able to climb stairs; if he can't, put cameras/small drones on other floors [DE]// A lot of falls also happen outside (garden) [DE] 8. (Users) without mentioning the HOMINT scenario, users pointed out that this scenario should be linked to emergencies. [ES] 9. (Users) regarding the detection, they would like Florence to detect strangers at home. [ES] 10. Robot as central station but additionally wearable systems (emergency button), robot checks if emergency signals are correct [DE] 11. Closed doors will be problematic [DE] 12. Video conferencing can also be used for first diagnosis of accident [DE] 13. In a lot of cases it will be good to have a video call instead of just a normal call [DE] 14. Very good if also medical data is present if medical staff arrives [DE] 15. Robot should not always follow (annoyance) e.g. only check every two hours [DE]	In a first step we will use a wearable emergency button but in a future view the robot should be able to detect the fall without the need of external hardware. The inclusion of a camera is optional since it can be turned off and the software uses a modular approach so that it should stay functional. The service will be designed that the user is able to cancel the alarm. Houses with stairs and gardens won't be considered at this stage. Closed doors also won't be considered now. The always-following-problem will be taken into account to design a movement that does not disturb the user.
AGEREM- Agenda reminder	1. (Prof)Other events should also be reminded, such as relative birthdays, etc. [ES] 2. (Prof) Programming the reminders should be easy[ES] 3. (Users) They request a voice as a reminder with a previous melody. [ES]	(1) The service will be designed to allow for the addition of events such as relatives birthdays. (2) Ease of use will be a primary focus in the design of the service. (3) The trials will be used to examine the most appropriate method to

		activate a reminder.
LIFIMP- Life improvement	1. (Prof) Activities and exercises can be shared with other users, linking this with connectivity. [ES] 2. (Prof) Ethical regulations play an important role in this scenario since it is important to be tactful when communicating certain facts (weight, health-state...) [ES] 3. (Prof) The tele-care unit must have access to irregularities in the sleep/mobility/weight pattern. [ES] 4. (Prof)It can be linked to the agenda reminder to give advice on diets, time to eat, time for a walk. [ES] 5. (Users) They feel high levels of intrusion. [ES] 6. (Users) They pointed out the need for this scenario to be optional depending on the user motivation. [ES] 7. (Users) They are more concerned about the diet coach. [ES] 8. They do not want relatives to be able to read their health status[DE] Agenda reminding is good, but how does the date input work? [DE] Breakfast advice: no (shopping is already done, a lot of different opinions for healthy food exist) [DE] No tips for daily schedule („sun is shining, go out“), easy access to theatre program etc. is welcome[DE] 9. Schedule of dates, medicine intake: good [DE] 10. Input via voice: essential [DE] 11. Voice should be adaptable (man/woman etc.) [DE] 12. Reminding of dates: good [DE] 13. Suggestions of training: good [DE] 14. Robot can give diet tips; should be able to say “no” [DE] 15. Correspondence with doctor: good [DE] 16. Benevolent supervision: ok [DE] 17. Robot should know about small vices and deny/admit [DE] 18. Participants were not sure they would always follow health-related advices from a robot [NL] 19. The robot should not be too “pushy” regarding giving advices, only in cases of real health risks [NL] 20. It should be possible to say “no” to an advice, after which the robot would be quiet for a while [NL] 21. A need is felt to be able to turn the robot off, or at least to stop its communication [NL] 22. It is no problem that the robot performs	Comments will be taken into account when implementing, but do not directly affect the use cases. Feedback from different focus groups was somehow contradictory (see comments related to healthy tips).

	health-related measures [NL] 23. It is no problem that health-related data are sent to a therapist, although participant would like to be able to control what is sent [NL] 24. Preferably health data are not sent to relatives, perhaps with a single exception [NL]	
DEVCOA-Device coach	1. Device problems are minor problems, and it feels strange to use a robot to solve them [NL] 2. Other approaches to solve device problems – asking kids, asking neighbours, finding a solution on the internet – are preferred [NL] 3. The participants would like to help others with device problems they would be able to solve [NL]	This scenario was removed. Please see 10.6 for further explanation.
COLGAM Collaborative gaming	1. (Users) They re-formulated the scenario , being so keen on the proactive role of the user of Collaborating Activities sharing knowledge (gardening, maternity, Knotting, entrepreneurship....) [ES] 2. (Prof) This scenario has to be worked out in a highly dynamic way. [ES]	(1) Create several application examples for the collaborative framework to show the diverse possibilities. (2) Include gesture pointing recognition and good quality communication (sound and video) to improve dynamicity.
LOGSYS	1. Showing trends and analysis: good[DE] Two kinds of people: some want no health tips / analysis, others want to know it exactly (and visits at the doctor's are part of a contact program) [DE] Reminders on training are good (but attitude to training won't be changed) [DE] Reminding on medical issues is also good[DE] 2. It is important who the access is give to: relatives, medical staff, neighbours; very personal, user has to be able to control it [DE] 3. Forwarding of data only if noticeable events occur [DE] 4. Person of trust who has access to the system and checks status regularly [DE] 5. Remind on keeping social contacts (when the last contacts have been); should be disengage able [DE] 6. All reminders except medical related should be disengage able [DE] 7. This is considered to be a very important application of a robot, compared to other scenarios [NL] 8. In some occasions, a robot is preferred over a person (for example, for homecare) to log health data, for example you don't need to get decently dressed [NL] 9. In the case of two elderly living together of which one has health problems, the	The access control will be of major interest of this scenario. No external person should be able to get the user's data. The service should be configurable, which reminders are presented to the user. This could be with different levels, such as "comfort", "medical", "spare time" and others. High level on configuration will also be given to the access control so that the user is able to exactly choose the persons that have access to the data.

	robot enables the more healthy partners to leave the house, knowing the robot will monitor the less-healthy partner staying at home [NL] 10. Logging of health related data is no problem [NL] 11. Sending health-related data to professionals is no problem, althoug hone would like to control what exactly is sent [NL]	
General	What about the costs for such a system? Do health insurance funds pay for it? Luxury or medical device?[DE] Robot as prosthesis for absence of physical contacts in our society[DE] Elderly are much more aware of the end of the life, direct contact to persons is very important. [DE] The elderly wants to arrange his day with his contacts, same problem with cell phones: the one who is called will be interrupted[DE] The older the people are, the harder it is for them to change their habits. The ones that were not able to live on their own before, won't make it afterwards[DE] The more assistance the people have, the more skills he will unlearn[DE] People need a lot of routine to control devices, things that aren't practiced every day will be unlearned[DE] Doors shouldn't stay open, also from ecological point of view. The robot should follow every step[DE] (contradictory to other comments were users want to be able to deactivate the following capability) What happens when batteries are empty? When the docking station is blocked? Reliability must be guaranteed, people trust in the system. The user won't be able to help the robot, some sort of service has to come [DE] Robot should be updateable[DE] Mental changes won't be achievable[DE] Health tips should be avoided[DE] Robot can't replace human contact[DE] Distributed sensors in the environment often mentioned [DE] Robot as object to talk with (if no one else available) [DE] A companion robot is not the main purpose of this project, but a mild support on this aspect could eventually be offered. Very important: have a scalable / modular system that can be adapted to users needs [DE] Important to have a phase to get familiar with the robot [DE] Playing games / listening to music is nice to have [DE] Better communication with relatives [DE] Robot should be able to say "no" (e.g. to make the elderly go out for physical contact) [DE] Main aspect is security (medical / safety); quality of life secondary [DE] Take into account that elderly are not so mentally active as before – introduce the robot early [DE] Robot has to be able to recognize if user is responsive [DE] Robot has to recognize speech [DE] What about electrical radiation? [DE] Should be able to clean the floor [DE] not the purpose of the project It should not be the case that every three years a new robot is needed (like in computer industry) [DE] Standardization and further compatibility with new products are key aspects. Remote administration is important [DE] Support regarding health and safety are clearly the most important functions of a robot [NL] The robot should not take over odd jobs, but motivate people to get into action (!) It should not make people lazy [NL]	

	"I'd like a robot that would dance with me" (comment from a 85-year-old woman) [NL] It would be nice if the robot provided support for hobbies (e.g. show examples while painting) [NL] "How expensive is that thing?" [NL] "Can it play a dvd?" [NL] The robot should have a button to turn it off [NL] contradictory to other comments in which they would like the robot to guarantee other services at all times (like fall detection). Robot should always be in an idle state for emergency services even if it's 'asleep' for other services, There are concerns regarding the camera ("you hear off many problems with webcams") [NL] Users clearly stated they would accept them only in emergency situations and in communication procedures (image communication) when they are in control ***General topic comments:*** *These are comments regarding the general Florence system. Users had a lot of different ideas and questions, which are presented here. Some aspects (like "I'd like a robot that would dance with me") won't be taken into account for the system, others (like "People need a lot of routine to control devices, things that aren't practiced every day will be unlearned") will be integrated into the Florence design.*
Appearance	Different comments: small, at the height of the hip, higher, compact, transportable, small like a dog [DE] Display should be accessible when sitting [DE] If robot helps in kitchen it has to be bigger -> height adaptable [DE] Technical appearance, not human [DE] Own voice [DE] Not too small to avoid stumbling over it [DE] Relation to robot: buddy, no emotions, would get name [DE] Telescopic mounting for display [DE] Too small would lead to stumbling [DE] When not needed: unobtrusive, small [DE] Display turnable to be used as table [DE] Rather technical than humanoid appearance [DE] Display as picture frame during standby [DE] Touch screen instead of keyboard can be beneficial when you have – for example – arthritis [NL] Will it be able to handle thick carpets? [NL] As technology progresses mobility of mobile platforms such as PekeeII will for sure be sufficiently enhanced as to be able to handle thick carpets. As apartments for elderly are not very large, the robot should not take up too much space [NL] ***Appearance related comments:*** *Even if not specially asked for, the users already had some ideas about the appearance of the robot. More concrete ideas are presented in the results of the Wizard of Oz tests which explicitly dealt with appearance aspects. The aspects mentioned above will be added to those adducted by the WoOz tests.*

Table 2. Scenarios in focus groups

In Table 3 the different key concepts addressed in D1.1 are documented based on the focus group results. The first column describes the general topic presented to the focus group and second column specifies subtopics within the discussion. In the third column the different scenario responsible identified key aspects to be presented to the focus groups, in the case where these issues were answered the comments from the focus groups are found in the fourth and last column. When independent focus groups for professionals (Prof) and end users (Users) were carried out, an additional indication is provided.

General topic	Subtopic and specific issues	Scenario key points for focus groups	Comments from focus groups
Acceptance	Current robot acceptance *- Feelings* *-Interest of proposed service* *- Could the robot be useful?* *- Perception of cost/benefit* *- Is it considered intrusive?*	1-[COLGAM] Cost/benefit: Would you be happy with a robot moving around the working surface knowing it helps you feel connected to the other person? Would you rather have a static robot? Does moving the robot make the other person more present? 2-[KEETOU] Do elderly want that their children receive some kind of clue on whether it is a good moment to call? (for example the elderly user did receive very little visits the last few days, or the elderly is not feeling well.) 3-[LIFIMP]: Do elderly want to measure their daily activities? Will they accept advice from a robot? 4-[LOGSYS] Is a robot considered as a spy if he logs data? 5-[HOMINT] Would you like to have a robot that can open / close windows, doors etc? Or is it frightening (Robot could take control of the home and arrest user)? 6-[FALHAN] Would you feel safer if you knew that there's a robot checking for accidents and calling help automatically?	1-(Prof) This should be up to the user in every moment depending how they feel. (Users) They would like to be able to change simple settings having two options 3-(Prof) Users may have problems with this (Users) The measures must be planned for long term advices ,and these should be done in a subtle way. 4-No, the robot isn't considered as a spy, but the gathered data has to be secured 5-The robot provides an interface to home control for the user. It is not supposed to autonomously control the home, except for cases where this is explicitly requested by the user (e.g. close the window automatically after 15 minutes). Taking away the control over his home from the user and passing it on to an autonomous robot system will not likely lead to a good user acceptance. 6- (Prof) Yes,General Agreement on this topic with some doubts about overall acceptance of the Robot itself, and sticking this scenario to certain profiles (Users) They will feel much safer even if there is no imminent problem of falls. 6- (Users) Yes, they would feel much safer.

	How to improve acceptance *- Reorient proposed service* *- Aesthetics (show examples and check for acceptance)* *Improve interaction* *- What if the robot is not presented as a "robot" but as a "technological personal assistant"?*	1-[LOGSYS] Which actions of daily living should NOT be logged at all 2-[COLGAM] Would you like the system to detect when you are feeling lonely or would you rather let the system know yourself how you are feeling? 3-[LIFIMP]: give clear (usability aspect!) control over what is measured and where it is send 4-[AGEREM] What should Florence do if the user fails to confirm the medication intake or just takes a bit longer? 5-[FALHAN] If the robot detected a fall, which person should the robot call first, a relative or the telecare center? 6-[HOMINT] Are there any devices the robot should not be able to control in any case (room doors etc)? 7-[LOGSYS] Would you like to be able to access your logged data from outside (mobile devices, internet)?	1-This depends heavily on the user's habits, in general all data is ok as long as it is needed to control health status 2-(Prof) Neither of them, it is too intrusive (Users) They would not mind to tell the system but just whenever they want. 3- (Users) Weigh, mobility, sleep, the telecare unit must be aware of irregularities. 4- (Prof) Remind the user first and then communicate with teleassistance unit (after a certain number of missed actions)(User) Communicate with Teleassistance 5- (Prof) The Telecare Centre since the tele care centre call itself the relatives. There is a high reliability on the service.(Users) Telecare unanimously. 6 – For the HOMINT scenario, the robot mainly acts as a mobile user interface. There is no autonomous control of the home from the robot, but only control that involves user interaction. As such, there are no limitations as to what can be controlled via the robot. 7-Access from outside is ok, as long as the access is restricted to explicitly chosen persons / a user access control is needed
Interaction	How user starts interaction *- Voice commands?* *- Touch screen?* *-Gesture recognition?* *- Activation in a user-worn device (bracelet with button)?*	1-[FALHAN] Do you like to have an additional panic button which calls the robot and sets it into an alarm state? 2-[COLGAM] Would you like the system to propose you to game when the other person is gaming or only when you demand the service? 3-[HOMINT] Do you want to have speech control for the home or just kind of pushbuttons on a screen? 4-[LOGSYS] How should a medical log be designed? Like a medical record or like a ships log or something?	1-(Prof and Users) That is included in Telecare 1-It would be good to have an alarm button in case the robot is not in the same room 2- (Prof) Both (Users) Both but having the option to disconnect at some point any incoming requests. 3-Speech control would be the preferred interaction method, it is most intuitive. A touch screen is the second most mentioned method. 4-No explicit answer on design because no samples could be presented
	How the system starts	1-[FALHAN] Would you mind the robot talk	1- (Prof) Users will mind, they will prefer a teleassistant voice

	interaction - *Voice communication* - *Light* - *Vibration* - *Warning in a user-worn device*	aloud to you to check if you are still responsive 2-[AGEREM] Should be an alarm, some melody? 3-[ALL] Should the robot approach you before starting to interact?	(Users) Users do not mind but prefer a teleassistance voice. 2- (Prof and Users) Better some voice with a melody announcing. 3- (Prof and Users) Yes but only when you call it, and not too closely.
	Usability aspects - *Size and colour of text, graphics…*	1-[KEETOU] What level of automation for remotely controlling the robot would the remote users want?(E.g. focusing the camera on the elderly's face could be done automatically) 2-[DEVCOA] How can video taping instructions be made intuitive to use for elderly? 3-[ALL] What is preferred, images or text (e.g. in case of buttons)?	3- (Prof) Images (Users) both, small text and bigger image
	Interaction flow	1-[COLGAM] Should the system always let you see your friend and the puzzle or only when your friend is talking? 2-[DEVCOA] Define correct moment to alert elderly of input to community. Make selection of input to be alerted about based on profile? 3-[AGEREM] Apart from the times in which medication has to be taken, shouldn't Florence assure the user he is up to date with all his medication? 4-[LOGSYS] Should the robot present a summary of the activities logged at the end ot the day? Should specific actions be erasable?	1-(Prof and Users) Always. 3- (Prof) That would be a relief for some users (Users) Yes , Users like to see that their medication is up to date. 4-A summary of daily activities is fine, but it should not be presented intrusively, better would be a presentation on demand (question on erasing was not answered)
Scenario-specific issues		1-[COLGAM] Is a puzzle a "common" collaborative game among elderly? What other collaborative games would they enjoy? 2-[KEETOU] For which situation would telepresence have clear benefits over a video	1- (Prof) For some users, especially women but domino and card are more common (Users) yes, but the puzzle has to be changed regularly. Domino and Cards are more common. Simple activities like gardening or knitting. 3-Widely spread: thermometer, smoke detector, light control

		call via the PC or TV? 3-[HOMINT] Which home automation devices are most widely spread? Which devices are expensive and rarely used?	modules, appliance modules (on/off), home automation wall switches, window shutter controllers/actuators, smart meters; more rarely used: window openers, networked kitchen appliances (oven, fridge etc.)

Table 3. General topics for focus groups

4 Summary feedback from Wizard of Oz tests

The Wizard of Oz tests are reported in deliverable "D1.4-Report on Wizard-of-Oz experiments". The aim of this section is to summarize and document the most relevant impact feedback from wizard of oz test had on the use cases. The following table (Table 4) has four columns;

- Key aspects: the robot's movement and orientation, looking towards user, as well as interaction, interrupt/awareness, notification, security, safety and appearance;
- Sub-aspect: appreciation of the key aspect;
- Comment, where results are described and;
- Partner from whose focus group the results were abstracted.

Key Aspect	Subaspect	Comment	Partner
Movement	Approach	The approach movement of the prototype has been seen by our users as convenient in terms of speed. Taking this speed, users see no problem in having a constant and steady movement. A remark was made thinking about emergency handling, where the Robot may be faster	FASS
Movement	Approach	With respect to controlling movement, users mostly preferred giving the robot voice commands.	NOVAY
Movement	Approach	After approaching, the distance to the screen should be around 50-60cm for maximum comfort. Regarding the direction of approaching, some users felt more comfortable with front-wise approaching, others preferred side-wise approach.	OFFIS
Movement	Follow	This aspect should be up to the user depending on the functionality. Most of users saw this as annoying. The underlying affirmation is that users want to have the control of the Robot all the time	FASS
Movement	Follow	When asked beforehand, on average users did not like the idea that the robot would follow them through the house. However, after having taken the initiative to give a `follow me` voice command or gesture, no user mentioned he or she did not like the following.	NOVAY
Movement	Follow	Direct following and indirect following was tested. The user preferred indirect following, it is not as annoying as direct (non-stop) following. The user were impressed that the robot can find them behind a corner. The scenario itself was predestined for the robot carrying things for the user.	OFFIS
Movement	General	Before meeting and interacting with the robot, a touch screen, buttons on the robot and voice control were all considered acceptable, whereas using a	NOVAY

		remote control was considered a bit unacceptable. After having tried voice control, gesture control and touch screen control, most users clearly preferred giving voice commands. However, when asked a few situations came up where gestures might be needed, e.g. `when you have a cold´. Voice should certainly not be removed, e.g. in situations when a user has fallen down. All voce and gesture commands always had to be preceded by calling the robot by her name: “Florence”. Participants learned the short voice commands (“here”, “stop”, “follow”, “go”, “play”, “pause”) very quickly and 4 out of six users mentioned in the interview afterwards that the robot listened very well. Voice control would have to be fine-tuned in two respects: the “stop” command seemed urgent enough for users to forget prefixing it with a name; therefore it should be available even without prefixing it with the name of the robot. Also, users did not always wait for the confirmation tone before proceeding with the command.	
Movement	Steer	We did not test direct steering.	NOVAY
Movement	Avoiding	Two tests were performed, one with the robot just moving backwards in direction of the user (user is forcing robot to go back) the other one with the robot trying to get out of the way as fast as possible. The user preferred the immediate “out of the way” strategy, the robot does not bother so much	OFFIS
Movement	Avoiding	The user forces the robot into a place where it can’t move anymore. Two strategies were tested: 1. the robot does not move anymore and stands still. 2. The robot turns left and right to signal that it don’t know where to go The user strongly preferred the second solution, if the robot just stands still you can’t recognize if the robot is working at all.	OFFIS
Movement	General	Sometimes, the user tends to stop the robot by just kicking the bumper gently.	OFFIS
Orientation	Autonomous	Unless is necessary or it is justified by some reason (Domotic Checking or security Checks) users disliked this orientation option. Again the control affirmation becomes relevant.	FASS
Orientation	Autonomous	We did not test autonomous orientation; our robot would never move nor orient by itself, only by command. This even applied when notifying the user of a	NOVAY

		message: a sound would be provided, but the robot would only move after being called.	
Orientation	Voice	The only way to orient our robot was to call its name, then it would orient towards the speaker. This worked fine.	NOVAY
Orientation	Gesture	All of them agreed that this is a very good idea. Controlling the robot by some gesticulation has been very popular, but even more predominant has been the voice option.	FASS
Orientation	Gesture	We did not test orientation (i.e. where it is facing) by gesture, our robot would only orient itself towards the user if the user would call it by name. For the rest, see movement.	NOVAY
Orientation	Tag	The most popular tag has been a bracelet even more popular than a pendant (broadly used in teleassistant)	FASS
Orientation	Tag	We did not test this option	NOVAY
Interaction	Sitting	The main problem was the distance between the arm and the screen, some user suggested that the robot/screen should be oriented on the side of the chair/couch. The height of the screen must definitely be adaptable	FASS
Interaction	Sitting	The height of our screen (about 1 m) and distance was fine for interacting while sitting at a kitchen table on a kitchen chair; both for observing what's at the screen and for touching the screen. The screen (11,6 inch) was considered large enough for images to be visible and text (a short sentence consisting of 4-8 words) to be readable. Using touch to confirm messages worked fine, but in the beginning one user tended to press too long. Using a capacitive touch screen seems to make touch operation light enough even for users with arthrosis. We reckon that a short one-time on-screen tutorial about touching might be useful.	NOVAY
Interaction	Standing	While playing the exercise video, most users chose voice commands rather than touch, which save them walking up to the robot and back. We also observed users may have to bend town a bit to read what's on the screen. It would be good if the screen could tilt up a little to be better readable in those situations. The screen (11,6 inch) was considered large enough for video to be visible from about 2 m distance.	NOVAY
Interaction	Lying	The main concern was to keep the distance in order to have a better video interaction. Camera movement has been	FASS

		proven to be essential in order to focus on the user.The stand must be adaptable. The main way to communicate from the lying position should be through voice.	
Interaction	Voice control	The users liked the voice control features very much. They didn't need much time to learn the commands. The robot reacted as expected. If the robot looks at you, it is sometimes confusing using left or right because that is mirrored. Even voice control is working, a touch screen is desired as well. Regarding the relationship to the robot the type of voice is also important (man/woman etc.).	OFFIS
Interaction	Touch screen	The touch screen was good to read. On the touch screen there should also be some kind of robot steering functions, in order to control the robot if voice or remote control don't work. The use of some kind of smiley to show emotions was considered to be good.	OFFIS
Interrupt/Awareness		Depending on the situation, for routinary interruptions they prefer a low profile melody whereas for something urgent they prefer an alarm. Note that certain melodies may confuse and not representing awareness.	FASS
Interrupt/Awareness		Messages and notifications should stay on the screen until they have been noticed	OFFIS
Notification		We used a friendly sound to notify users that the robot recognized that it was called by name and open for further instructions. We used the default sound of MSN messenger to notify users of a notification. We received no complaints about this. One user even recognized the MSN sound.	NOVAY
Security		Unless the use is interacting with the robot via screen, the security distance should be of 1 meter or a similar where the screen is reachable by hand.	FASS same for OFFIS
Safety		Some questions regarding the safety of the robot itself were risen: What happens if the robot falls over? Is there some kind of protection? Can he get back up? Are there enough sensors for obstacle detection?	OFFIS
Appearance	Size	Users liked the fact that you don´t have to look up to the robot while sitting; it is not frightening, but friendly.	NOVAY
Appearance	Size	The height (approx. 1.4 meters) was nearly perfect while sitting on the couch. If the user gets up, it could be a little higher -> the stand should be height	OFFIS

		adjustable. The robot itself seemed to be a little big compared to the size of the room (very dominant).	
Appearance	Face	Before meeting the robot, the mobile robot without screen and pet-style look were the most preferred options. After meeting and interaction with the robot, however, the mobile robot with screen and face (before meeting more disapproved of than approved), was the most favourite option. We believe that giving the robot a friendly face has a very high face value. Two out of six users even gave the robot a compliment after having completed their first instruction: “well done”, with an intonation much like you would praise a dog or child.	NOVAY 
Appearance	Style	Two users commented that they didn’t like the cloth we draped around the robot and that the looks of the robot should be a bit more taut, like the sketch we’ve shown them.	NOVAY
Appearance	Wheels	With respect to movement, hidden wheels were the most preferred option, visible wheels were deemed acceptable, both before and after meeting the robot.	NOVAY
Appearance	Usage	A tablet would be nice to have. Some users indicated to use the display as tablet if it is not in use (move it in horizontal position) If the stand is shaking like it is now, a bag would be better than a tablet. If the robot is in charging station, it should indicate that it is still turned on and working. Some users also suggested to use the robot for cleaning the floor. Climbing stairs would be another thing that users wish to have because most of them have stairs at their homes.	OFFIS

Table 4. Wizard of Oz results summarized

5 Final Scenarios and Use cases

In this section the generation of use cases can be followed. Each section is dedicated to a scenario (e.g. 7.1 is dedicated to Keeping in touch scenario). Within each of the sections there are four subsections:

- *After focus groups feedback*, where the initial set of use cases are drawn from the scenario description in D1.1 taking into account results from focus groups. In order to ease the reading this first subsection can be found in ANNEX B: Initial Use Cases
- *Feasibility check comments*, where a feasibility check for every use case is performed. When use cases are highly affected by the feasibility check the new use case is described.
- *After WoOz tests*, where impact on scenarios from the tested aspects and sub-aspects is analyzed. If necessary the affected use cases will be redefined.
- *Final scenario and use cases.* This subsection will help the reader to immediatly access the final scenario and use cases. In this subsection a reflection on how to expand each scenario is also included.

5.1 Keeping in touch [KEETOU]

5.1.1 Feasibility check comments (Version B)

USE CASE ID	Name	Modules necessary	Actions to be taken over the use case
KEETOU.0001	*Accept a Call*	*Modules foreseen in the project:* • *Dialogue Management* • *Notification System* • *Sensor System*	None, use case feasible
KEETOU.0002	*Initiate a Call*	*Modules foreseen in the project:* *Modules foreseen in the project:* • *Dialogue Management* • *Sensor System*	None, use case feasible
KEETOU.0003	*Control by Remote*	*Modules foreseen in the project:* • *Dialogue Management* • *Notification System* • *Sensor System* • *Remote Access*	None, use case feasible
KEETOU.0004	*Share photos*	*Modules foreseen in the project:* • *Dialogue Management* • *Notification System*	None, use case feasible

Table 5. KEETOU feasibility check table

5.1.2 After WoOz tests feedback (Version C)

The results of the WoOZ have no direct consequence on the KEETOU scenario.

5.1.3 Final scenario and use cases

It is Tuesday morning and Carla is feeling down, the bad weather doesn't help. She gets up and makes some coffee. Carla widowed four months ago and since then she is feeling lonely. On Tuesdays she would play tennis with her husband, but today she is not feeling like going out on her own.

The Florence system detects Carla's mood and lets Marcus, her son and Sofia, her friend, know that Carla would benefit from some chatting.

Sofia phones Carla. The Florence system finds Carla and lets her know she has a request for virtual visit call. Carla accepts and Sofia and Carla happily talk to each other. Sofia can virtually move with Carla in the house to check the new curtains Carla would like to show her. By the time they hung up Sofia is feeling much better and starts preparing lunch.

In the evening the Florence system receives two pictures from Marcus's son's social networking tool. The Florence system knows Carla has been watching TV all the afternoon so it informs her about the new pictures.
Carla likes one picture very much and let's her grandson know about it.

Element name	**Accept a call**
Use Case ID *	**KEETOU.0001**
Name *	Accepting a call
Version	1
Date	2010/11/14
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Dietwig Lowet (Philips, Dietwig.lowet@philips.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Sofia notices in the agenda of her mother, Carla, that she had received very little visits the last few days. Therefore, Sofia decides to pay her mom a "virtual" visit today. 2. Sofia initiates a call from her "device". 3. The Florence system gets the call. 4. The Florence robot approaches Carla who sits on the couch in her living room. 5. It lets her know she has a call for a virtual visit from Sofia. 6. It asks Carla for confirmation. 7. Carla accepts the call. 8. Sofia and Carla talk to each other.
Description *	Sofia sends an invitation to Carla to talk with her
Priority	
Actors	Sofia and Carla (the users)
Stakeholders	Sofia: she asks to Florence for starting the service Carla: she receives the Sofia's invitation
Basic course of action (path) *	1. Sofia goes to Florence to ask him to start the service

Element name	Accept a call
Use Case ID *	**KEETOU.0001**
Alternate courses of action (path) */2	
Preconditions *	Florence is waiting
Triggers	Sofia ask to Florence for connecting with Carla
Postconditions *	Sofia and Carla are connected to talk
Error conditions/Exceptions */2	1. Florence cannot contact Carla: tell to Sofia that the connection cannot be done and close the service 2. Carla rejects Sofia's proposal: tell to Sofia that Carla rejected the proposal for playing
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	The connection was made successfully

Element name	Initiate a call
Use Case ID *	**KEETOU.0002**
Name *	Accepting a call
Version	1
Date	2010/11/14
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Dietwig Lowet (Philips, Dietwig.lowet@philips.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Carla calls the Florence system. 2. The Florence robot approaches Carla. 3. Carla asks it to call Marcus. 4. The Florence system tries to reach Marcus by first calling him at his work. 5. Marcus accepts the call on his "device". 6. Carla and Marcus talk to each other.
Description *	Carla initiates a call to her son Marcus.
Priority	
Actors	Carla and Marcus (the users)
Stakeholders	Carla: she asks to Florence for starting the service Marcus: she receives the Sofia's invitation
Basic course of action (path) *	1. Carla sits on a couch in her living room 2. Carla feels lonely 3. Carla decides to contact her son Marcus.
Alternate courses of action (path) */2	1. Marcus is not at work, so the Florence system tries to reach Marcus at his home.
Preconditions *	Florence is waiting
Triggers	Carla ask to Florence for connecting with Marcus
Postconditions *	Carla and Marcus are connected to talk
Error conditions/Exceptions */2	1. Florence cannot contact Marcus anywhere: tell to Carla that the connection cannot be established and close the service 2. Marcus rejects Carla's invitation: tell to Carla that Marcus rejected the invitation for a telepresence session.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	

Element name	Initiate a call
Use Case ID *	KEETOU.0002
Assumptions (Optional)	The connection was made successfully

Element name	Control by remote
Use Case ID *	KEETOU.0003
Name *	Control by remote
Version	1
Date	2010/11/14
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Dietwig Lowet (Philips, Dietwig.lowet@philips.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Carla stands up from the couch and moves towards the curtains. 2. The Florence robot follows her, remotely controlled by Sofia from her "device". 3. During the talk, close to the curtains, Sofia remotely controls the Florence robot to alternate between having a better look at the curtains and seeing Carla's face (to follow the conversation). 4. After finishing the talk, Carla moves towards the couch. 5. The Florence robot follows her, remotely controlled by Sofia from her "device". 6. Carla sits down on the couch.
Description *	Several days ago, new curtains were installed in Carla's living room. During the virtual visit from Sofia, Carla decides to show Sofia the new curtains.
Priority	
Actors	Sofia (the users)
Stakeholders	Sofia: moves Florence by a remote control
Basic course of action (path) *	1. Sofia controls the robot remotely using either a keyboard or a gaming-type like controller 2. If Sofia makes a mistake and the robot is to hit some obstacle. The robot will detect this and avoid the obstacle. The robot will also send a warning signal to Sofia to let her know that she was about to hit an obstacle. This could be implemented for example by a rumbling in the controller.
Alternate courses of action (path) */2	
Preconditions *	Carla and Sofia are already connected
Triggers	
Postconditions *	Sofia and Carla are connected to talk
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	KEETOU.0001 – Accept a call
Assumptions (Optional)	

Element name	Share photos
Use Case ID *	KEETOU.0004
Name *	Sharing photos
Version	1

Element name	Share photos
Use Case ID *	**KEETOU.0004**
Date	2010/11/14
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Dietwig Lowet (Philips, Dietwig.lowet@philips.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. While Carla is watching TV, Carla's grandson sends her two pictures from his social networking site. 2. The Florence system receives the pictures. 3. When the Florence system recognizes that Carla stopped watching TV, it offers her to see the pictures. 4. Carla accepts. 5. The Florence system shows the new pictures. 6. Carla sees the photos
Description *	When the Florence robot receives new pictures the elderly will be triggered that new pictures are available. A good moment for triggering must be found: the elderly can be busy, having visitors, watching TV, etc and does not always want to be bothered with having to view new pictures. Therefore the Florence system has to determine the appropriate time for showing the elderly the new pictures. At a certain time on the day the robot starts to check if the elderly is ready for watching the pictures (only when new pictures have arrived). The robot can check if the elderly is ready to view the new pictures by trying to determine if the elderly is occupied. The Florence robot can determine that the elderly is watching television and conclude that he/she does not want to be bothered right now. When the Florence robot has determined that now would be an appropriate time to display the pictures it will approach the elderly and asks if he/she would like to view the new pictures. The robot will display a thumbnail view of all the new pictures and the elderly can select which one to view. For each picture the elderly can send feedback to the person that has sent the picture. This feedback can be in the form selecting a number of phrases from a list by touch or by voice.
Priority	
Actors	Carla and Carla's grandson (the users)
Stakeholders	Carla's grandson: send the photos Carla: sees the photos
Basic course of action (path) *	
Alternate courses of action (path) */2	After see the photos, Carla likes one picture very much and lets her grandson know about this
Preconditions *	Carla has been watching TV all the afternoon
Triggers	
Postconditions *	Carla sees the photos
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	

Element name	Share photos
Use Case ID *	**KEETOU.0004**
Included use cases (Optional)	KEETOU.0001 – Accept a call
Assumptions (Optional)	Carla accepts the photos and sees them

In Table 6 a reflection on how to expand the KEETOU scenario is included, as well as a very rough estimation of the foreseen technical modifications involved in it.

KEETOU	Additional functionality for scenario expansion	Foreseen technical modification
Remote groceries/etc. shopping	Remote payment capability or payment when delivered at home.	Low
Doctor appointments remotely	Special focus on privacy (safe communication and transfer of health data) Appointment manager would be needed. It would be nice to have connection to pharmacy resources.	Medium

Table 6. KEETOU expansion table

5.2 Advanced Home Interface [HOMINT]

5.2.1 Feasibility check comments (Version B)

USE CASE ID	Name	Modules necessary	Actions to be taken over the use case
HOMINT.0001	*Receiving Reminders*	*Modules foreseen in the project:* • *Dialogue Management* • *Notification System* • *Sensor System* • *Remote Home Control System*	None, use case feasible
HOMINT.0002	*Receiving Door Step Notification*	*Modules foreseen in the project:* • *Dialogue Management* • *Notification System* • *Sensor System* • *Remote Home Control System*	None, use case feasible
HOMINT.0003	*Door Step Communication System*	*Modules foreseen in the project:* • *Dialogue Management* • *Notification System* • *Sensor System* • *Door Step Communication System* • *Remote Home Control System*	None, use case feasible
HOMINT.0004	*Remote Control Home*	*Modules foreseen in the project:* • *Remote Home Control System*	None, use case feasible

Table 7. HOMINT feasibility check table

5.2.2 After WoOz tests feedback (Version C)

The results of the WoOZ tests have no direct consequence for the HOMINT scenario.

5.2.3 Final scenario and use cases

John is 75 years old, he suffers from hearing impairment and is sitting on his couch watching TV. To switch off the main room light without getting up he just asks the robot to switch it off and turn on the lamp next to his TV. The Robot takes John's order and passes it to the home control system which in turn switches off the light in the room and powers up the smaller lamp.

While John is watching TV, the door bell is ringing, because John's friend Alex is visiting. John's door bell is equipped with camera and a microphone/speaker system. If someone is ringing the bell, John can see and interact with the person on the other side of the door using whatever interface is currently in use by John, i.e. which interface John is currently interacting with. This could be the TV set, a mobile phone or the Robot.

Since John is currently using the TV, he gets a visual notification on the TV indicating the door bell is ringing. The output of the camera on the door bell is also shown to John, so he can see who is in front of the door.

John's friend Alex can even speak into the outdoor camera's microphone which may result in a transcription of the words to text (speech recognition) shown on John's screen(s).

Using the robot and/or the TV remote control, John can instruct the opening of the door. This again is automated by the home control system the robot interfaces with.

While John and Alex are having fun in the living room, the windows in John's bedroom are open. Taking into account sensor information, e.g. room temperature and humidity level, the robot realises that the window has been opened for long enough and the air quality is now ok. It therefore suggests John to close it. John agrees and the robot sends a signal to the home control system to close the windows automatically.

Element name	**Receiving reminders**
Use Case ID *	**HOMINT.0001**
Name *	Receiving reminders about open windows, left-on oven, etc.
Version	1.0
Date	2010
Author(s)	Florian Winkler, NEC, Winkler@neclab.eu
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The system detects if windows are left open or a stove or light is left turned on and reminds the elderly to close them or turn them off. The reminders are linked to the home automation system to remotely close windows or turn off lights.
Priority	Normal
Actors	John (primary) Alex (secondary)
Stakeholders	User, Florence Home System
Basic course of action (path) *	1. The user is reminded to open the window to refresh

Element name	Receiving reminders
Use Case ID *	**HOMINT.0001**
	the air in the room 2. The user remotely opens the window and an automatic timer within the system is activated to remind the user after 15 minutes to close the window again 3. The elderly person forgets to close the open window 4. After 15 minutes the system initiates an automatic reminder informing the user about the open window and with a recommendation to close it again. 5. The Notification is displayed on the user interface currently in use by the elderly (this could be the TV, the mobile phone or the robot)
Alternate courses of action (path) */2	None
Preconditions *	The window / stove must have been turned on. The user must not have turned off the devices, otherwise no reminder will be triggered / necessary.
Triggers	Timeout of a reminder timer.
Postconditions *	If the window was closed / stove turned off by the user, reminder timers are deactivated. If they were not turned off, the reminder timer is reset and more reminders will be triggered periodically.
Error conditions/Exceptions */2	None
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Receiving Door Bell Notification
Use Case ID *	**HOMINT.0002**
Name *	Receiving notifications from the door bell / intercom system. This includes the following sub use cases: • Receiving notifications via room lights (in case the person is deaf) • Receiving textual/audible notifications on the TV screen • Receiving textual/audible notifications on the mobile phone • Receiving textual/audible notifications on the mobile robot
Version	1.0
Date	2010
Author(s)	Florian Winkler, NEC, Winkler@neclab.eu
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	To allow the elderly to notice when visitors are ringing the door bell even if the elderly are deaf or blind, this use case describes ways to notify the elderly of door bell events.
Priority	Normal
Actors	John (primary)

Element name	Receiving Door Bell Notification
Use Case ID *	**HOMINT.0002**
	Alex (secondary)
Stakeholders	User, Florence Home System
Basic course of action (path) *	Alex, a friend of John, the elderly person is visiting. John is hearing impaired. 1. Alex rings the door bell 2. The Florence Home Interface detects the door bell being rung 3. The Florence Home Interface generates a door bell notification to be dispatched to John 4. The Florence Home Interface queries the Florence system for the current user interface that John should be notified on 5. Since John is watching TV, the Florence Home Interface dispatches the notification to the TV where it is displayed as a pop up 6. Additionally, the room lights start to flicker in a pattern that indicates to John that the door bell was rung
Alternate courses of action (path) */2	None
Preconditions *	The door bell has to be connected to the Florence Home Interface as well as all possible interfaces that the elderly person might want to receive a door bell notification on. If the room lights are used to indicate a door bell ring, the elderly should be familiarized with the flicker pattern.
Triggers	Door bell being rung
Postconditions *	None
Error conditions/Exceptions */2	None
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Operate Doorstep Communication System
Use Case ID *	**HOMINT.0003**
Name *	Remote control of doorstep communication system / intercom. This includes the following sub use cases: • Check door step camera • Receive speech-to-text transcripts of voice recording from visitors at door step • Remotely lock / unlock doors • Remotely communicate with visitors at door step via TV, mobile or robot
Version	1.0
Date	2010
Author(s)	Florian Winkler, NEC, Winkler@neclab.eu
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	Give elderly users with hearing / seeing problems remote access to and control over doors and intercom from home devices like TV, mobile phone, mobile

Element name	Operate Doorstep Communication System
Use Case ID *	**HOMINT.0003**
	robot.
Priority	Normal
Actors	John (primary) Alex (secondary)
Stakeholders	User, Florence Home System
Basic course of action (path) *	1. Alex comes to visit John 2. Alex rings the door bell 3. John is notified of this on his TV, mobile phone or robot 4. John accesses the intercom from his TV, mobile phone or robot 5. John can see Alex via the live video feed from the door step camera on his TV, mobile phone or robot 6. He can communicate with Alex at the door step via the intercom system 7. Since John has hearing problems, the Florence Home System performs speech recognition that transcribes the words spoken by Alex in written text. This text is shown on John's TV, mobile phone or robot 8. John asks Alex in and remotely opens the lock of the front door
Alternate courses of action (path) */2	None
Preconditions *	John must have been informed about the door bell being run which is described in use case HOMINT.0002
Triggers	Door bell being rung
Postconditions *	None
Error conditions/Exceptions */2	None
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Remote Control Home
Use Case ID *	**HOMINT.0004**
Name *	Remotely control home appliances from TV, mobile phone or mobile robot.
Version	1.0
Date	2010
Author(s)	Florian Winkler, NEC, Winkler@neclab.eu
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	Assist the elderly in keeping control over their home by allowing them to open/close windows, lock and unlock doors, control lights, heating and air conditioning systems and provide a safer home environment by smart metering solutions that detect turned on heat sources like ovens. This includes use cases like: • Open/close shutters • Open/close windows

Element name	Remote Control Home
Use Case ID *	**HOMINT.0004**
	• Set preset light levels for different atmospheres • Turn on/off lights
Priority	Normal
Actors	John (primary)
Stakeholders	User, Florence Home System
Basic course of action (path) *	1. John is reminded to refresh the air by opening a window 2. John accesses the remote home control menu of the Florence Home System 3. He gets an overview of all windows in his house together with the state they are in (open/closed). 4. He selects a window either on his TV with the remote control, or on his robot or mobile phone with the touch screen. 5. The Florence home system automatically opens the window and set a timer to remind John to close it later. 6. John decides that he wants to have a more cosy atmosphere to read his book 7. He selects a preset “Reading Light” light setting 8. The Florence Home System turns down the main room lights, and fades on the reading lights in the room 9. John can access the lighting menu of the Florence Home System, where he can select which lights he wants to turn on or off
Alternate courses of action (path) */2	None
Preconditions *	None
Triggers	User interaction with home remote control system
Postconditions *	Depending on the actions of the user (e.g. if he opened a window) timers might be set that will trigger reminders in the future (e.g. to close the window)
Error conditions/Exceptions */2	None
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

In Table 8a reflection on how to expand the HOMINT scenario is included, as well as a very rough estimation of the foreseen technical modifications involved in it.

HOMINT	Additional functionality for scenario expansion	Foreseen technical modification
Adapt interfaces in other environments	Functionalities provided by the different spaces (such as hospitals, care centres, supermarkets, offices)	It varies depending on the technical complexity of making the HOMINT system compatible with other sensors and actuators that could be found in other environments.

Table 8. HOMINT expansion table

5.3 Fall situation handling [FALHAN]

5.3.1 Feasibility check comments (Version B)

USE CASE ID	Name	Modules necessary	Actions to be taken over the use case
0001-0004	*Fall handling*	*Modules foreseen in the project:* *-Panic Button (-detection)* *-Telepresence functionality*	None, use case feasible

Table 9. FALHAN feasibility check table

5.3.2 After WoOz tests feedback (Version C)

Scenario Use case ID/Name	Relevant WoOz aspects and feedback	Modification to the use cases
0002	*Approach the user*	Do not approach nearer than 50cm.
0003	*Establish telepresence session*	No modification necessary.
0002	*Follow the user*	The robot should not always follow the user, this is annoying. It would be enough if the robot only follows if the user gets out of sight.

Table 10. FALHAN WoOz impact table

5.3.3 Final scenario and use cases

Peter is in a relative good physical and mental condition for his age. He lives on his own since four years ago he widowed. His sons live in the same city as him and visit Peter at least twice a week. Peter has lately started to be aware of his forthcoming age decline and requested the Tele-care service along with the Florence system. This makes him feel secure in case of an unexpected emergency.

In fact, he has already had an accident a while ago. The experience has not been too traumatic since he was supported from the beginning. While the emergencies were coming to Peter´s place, the tele-care operators called Peter´s son. They were following a protocol to support Peter. Peter now regards Florence as a need.

Peter has just woken up at the usual time. While he was preparing some breakfast and for no apparent reason he fell down and is not able to move naturally. He is in pain and fears the fact that he is alone and does not know how serious his fall was. Florence robot recognizes that fall and quickly approaches Peter. The tele care service gets notice and communicates with Peter calming him down, assessing the situation and warning the local emergency units.

Element name	**Locate**
Use Case ID *	**FALHAN.0001**
Name *	• Locate User
Version	1.0
Date	10th of January 2011
Author(s)	Melvin Isken (OFFIS)
Change history [Optional]	
Due date	
Event identifier(s)	1. Robot locates user
Description *	The robot wants to get in contact with the user and needs to locate him to do this.
Priority	
Actors	User Robot
Stakeholders	User Robot
Basic course of action (path) *	*1. The system software asks for locating the user* *2. The robot checks the environmental and internal sensors to locate the user* *3. The position of the user is provided to the software*
Alternate courses of action (path) */2	In the case that the robot fails to locate the user, an error message could be sent to the telecare centre
Preconditions *	- The user normally inhabits in accessible places for the robot.
Triggers	Fall
Postconditions *	
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	Every Fall
Extended use case (Optional)	

Element name	**Locate**
Use Case ID *	**FALHAN.0001**
Included use cases (Optional)	
Assumptions (Optional)	The user has to be accessible

Element name	**Approach**
Use Case ID *	**FALHAN.0002**
Name *	• Approach User
Version	1.0
Date	10th of January 2011
Author(s)	Melvin Isken (OFFIS)
Change history [Optional]	
Due date	
Event identifier(s)	1. Robot approaches user
Description *	In order to establish a successful telepresence call (and judgement by the teleoperator), the robot needs to approach the user
Priority	
Actors	User Robot
Stakeholders	User Robot
Basic course of action (path) *	*1. The system software instructs the robot to drive to the desired place*
Alternate courses of action (path) */2	In the case that the robot fails to approach the user, an error message could be sent to the telecare centre
Preconditions *	- The user normally inhabits in accessible places for the robot. - The robot has located the user
Triggers	Fall
Postconditions *	
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	Every Fall
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	The user has to be accessible

Element name	**Provide VoIP interface**
Use Case ID *	**FALHAN.0003**
Name *	• Provide VoIP interface
Version	1.0
Date	10th of January 2011
Author(s)	Melvin Isken (OFFIS)
Change history [Optional]	
Due date	
Event identifier(s)	1. The robot has located and approached the user 2. The robot establishes a VoIP call between telecare centre and the user (robot)
Description *	The robot calls the telecare centre and enables the teleoperator to check and talk to the elderly
Priority	
Actors	User Robot Telecare operator
Stakeholders	User

Element name	**Provide VoIP interface**
Use Case ID *	**FALHAN.0003**
	Robot Telecare operator
Basic course of action (path) *	1. *The system software calls the telecare centre* 2. *The teleoperator checks the situation and tries to get in contact with the elderly* 3. *The teleoperator decides which steps to take next*
Alternate courses of action (path) */2	In the case that the robot fails to connect to the telecare centre, it can try to contact a relative of the elderly
Preconditions *	- The user normally inhabits in accessible places for the robot. - The robot has approached the user
Triggers	Fall
Postconditions *	
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	Every Fall
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	The user has to be accessible

Element name	**Recognize Fall**
Use Case ID *	**FALHAN.0004**
Name *	• Recognize fall
Version	1.0
Date	10th of January 2011
Author(s)	Melvin Isken (OFFIS)
Change history [Optional]	
Due date	
Event identifier(s)	1. The robot gets a message from the panic button or the user that a fall has happened
Description *	Fall recognized
Priority	
Actors	Sensors Robot
Stakeholders	Robot
Basic course of action (path) *	1. *The user presses the panic button or calls the robot for help* 2. *The robot recognizes the fall and executes the fall situation handling process*
Alternate courses of action (path) */2	
Preconditions *	- The user normally inhabits in accessible places for the robot. - The panic button is working
Triggers	Fall
Postconditions *	
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	Every Fall
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

In Table 11 a reflection on how to expand the FALHAN scenario is included, as well as a very rough estimation of the foreseen technical modifications involved in it.

FALHAN	Additional functionality for scenario expansion	Foreseen technical modification
Other emergencies handling	The 'fall detection' should be substituted by other emergencies detection module ('flood detection', 'gas leak detection'), but the protocol and the established communication procedure could be reutilized.	Depending on the specific emergency detection module (and also the needed sensors).

Table 11. FALHAN expansion table

5.4 Agenda reminder [AGEREM]

5.4.1 Feasibility check comments (Version B)

USE CASE ID	Name	Modules necessary	Actions to be taken over the use case
AGEREM.0001	*Check the daily agenda*	*Modules foreseen in the project:* *Multi Modal Interface* *Robot UI* *Mobile Phone UI* *Data Logging* *User Agenda*	None, use case feasible
AGEREM.0002	*Get task reminder*	*Modules foreseen in the project:* *Decision Making* *Planner* *Context Management* *User Localisation* *Actuation Triggering* *Multimodal Interface* *Robot UI* *Mobile Phone UI*	None, use case feasible
AGEREM.0003	*Get task information*	*Modules foreseen in the project:* *Dialogue Manager* *Context Management* *User Localisation* *Decision Making* *Actuation Triggering* *Multimodal Interface* *Robot UI* *Mobile Phone UI* *Data Logging* *User Agenda*	None, use case feasible
AGEREM.0004	*Set task as accomplished*	*Modules foreseen in the project:* *Dialogue Manager* *Context Management* *User Localisation* *Decision Making* *Actuation Triggering* *Multimodal Interface* *Robot UI* *Mobile Phone UI* *Data Logging* *User Agenda*	None, use case feasible

AGEREM.0005	*Set task for the user*	*Modules foreseen in the project:* *TUC User Interface* *TUC Agenda Manager* *TUC User Database* *TUC Multimedia Communication* *Multimedia Communication* *Access Control* *Datalogging*	None, use case feasible
AGEREM.0006	*Manage tasks for a given user*	*Modules foreseen in the project:* *TUC User Interface* *TUC Agenda Manager* *TUC User Database* *TUC Multimedia Communication* *Multimedia Communication* *Access Control* *Datalogging*	None, use case feasible
AGEREM.0007	*Manage Not-Accomplished Task*	*Modules foreseen in the project:* *Context Management* *Decision Making* *Actuation Triggering* *Multimedia Communication* *TUC User Interface* *TUC Multimedia Communication*	None, use case feasible
AGEREM.0008	*Perform telecommunication*	*Modules foreseen in the project:* *TUC User Interface* *TUC Multimedia Communication* *Context Management* *Multimedia Communication*	None, use case feasible
AGEREM.0009	*Call Emergency service*	*Modules foreseen in the project:* *TUC Multimedia Communication* *TUC User Interface* *Multimedia Communication* *Access Control* *Datalogging*	None, use case feasible

Table 12. AGEREM feasibility check table

5.4.2 After WoOz tests feedback (Version C)

Scenario Use case ID/Name	Relevant WoOz aspects and feedback	Modification to the use cases
AGEREM.0001 Check the daily agenda	The touch screen was good to read.	None

AGEREM.0003 Get Task Information	The users liked the voice control features very much. They didn't need much time to learn the commands. The robot reacted as expected. Even voice control is working, a touch screen is desired as well. Regarding the relationship to the robot the type of voice is also important (man/woman etc.).	None
AGEREM.0002 Get Task Reminder	Depending on the situation, for routinary interruptions they prefer a low profile melody whereas for something urgent they prefer an alarm. Note that certain melodies may confuse and not representing awareness.	None
AGEREM.0004 Set Task As Completed	Messages and notifications should stay on the screen until they have been noticed	None
AGEREM.0002 Get Task Reminder	We used a friendly sound to notify users that the robot recognized that it was called by name and open for further instructions. We used the default sound of MSN messenger to notify users of a notification. We received no complaints about this. One user even recognized the MSN sound.	None

Table 13. AGEREM WoOz impact table

5.4.3 Final scenario and use cases

Quite often Santiago fails to remember to take his medication. Even when he does remember, he often makes a mistake with regards to which one and how many to take. After having lunch, Santiago usually takes a nap. On this instant right before his nap, he should have remembered to take his medication. The Florence alarm goes off and the whole system approaches Santiago. He notices the alarm and wakes up. The Florence alarm is a reminder for Santiago to take his medication. After taking the required medication, Santiago confirms to the system that he has done so and the action is recorded. In the case that he does not confirm his action, or the telecare unit detects a failure on the intake, Santiago will be contacted to make sure he is fine. Santiago feels relieved due to the fact that thanks to Florence his medicine intake is not going to be compromised by his memory failures.

Element Name	Check the daily agenda
Use Case ID	AGEREM.0001
Name	Check the daily agenda
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	

Due date	
Event identifier	
Descriptor	Context: Santiago wants to know his agenda for the day. A. Santiago is at home: 1. Santiago opens the agenda menu of the robot application 2. The Florence System sends the agenda information to the robot application B. Santiago is not at home: 1. Santiago opens the FLORENCE application on his mobile phone 2. Santiago selects the agenda option of the FLORENCE application 3. The Florence System sends the agenda information to the mobile phone application

Element Name	Get Task Reminder
Use Case ID	AGEREM.0002
Name	Get Task Reminder
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: A task is due soon and the FLORENCE system reminds the user about it. 1. The FLORENCE system detects that a task is due soon 2. The FLORENCE system checks if Santiago is at home 3. The FLORENCE system sends a reminder to Santiago a. If Santiago is at home, FLORENCE sends a reminder via the FLORENCE robot b. If Santiago is not at home, FLORENCE sends a reminder via the mobile phone

Element Name	Get Task Information
Use Case ID	AGEREM.0003
Name	Get Task Information
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	

Descriptor	Context: Santiago wants to know more detail about a given task A. Santiago is at home: 1. Santiago asks the robot to get near him 2. Santiago goes to the Agenda in the FLORENCE robot menu 3. Santiago selects a particular tasks 4. Santiago selects the More information option of the FLORENCE robot application 5. The Florence system sends the information to the robot application B. Santiago is not at home: 1. Santiago opens the FLORENCE application on his mobile phone 2. Santiago selects the agenda option of the FLORENCE mobile application 3. Santiago selects a particular tasks 4. Santiago selects the More information option of the FLORENCE mobile application 5. The Florence system sends the information to the mobile application

Element Name	Set Task As Accomplished
Use Case ID	AGEREM.0004
Name	Set Task As Accomplished
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: Santiago has performed a task and wants the system to know A. Santiago is at home: 1. Santiago asks the robot to get near him 2. Santiago goes to the Agenda in the FLORENCE robot menu 3. Santiago selects a particular tasks 4. Santiago selects the mark as accomplished option of the FLORENCE robot application 5. The FLORENCE system updated the information regarding this task B. Santiago is not at home: 1. Santiago opens the FLORENCE application on his mobile phone 2. Santiago selects the agenda option of the FLORENCE mobile application 3. Santiago selects a particular tasks 4. Santiago selects the mark as accomplished option of the FLORENCE mobile application 5. The Florence system updates the information regarding this task

Element Name	Set Task For User
Use Case ID	AGEREM.0005
Name	Set Task For User
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: The Tele-assistance Unit Centre (TUC) wants to schedule a new task for the user 1. The TUC professional selects a particular user from his list 2. The TUC professional selects the Manage Agenda Option 3. The TUC professional a. Selects the create new task option and assigns a new task to the user b. Selects a task from the list and chooses the modify option 4. The Tele-assistance Unit Centre professional inputs the new data (description, schedule, due date…) 5. The task information is updated on the FLORENCE system

Element Name	Manage Tasks for a Given User
Use Case ID	AGEREM.0006
Name	Manage Tasks for a Given User
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: The TUC wants to review/modify the tasks for a particular user. 1. The TUC professional selects a particular user from his list 2. The TUC professional selects the Manage Agenda Option 3. The TUC professional navigates between the tasks for the user, setting new ones or modifying already existing ones, or just checking which the new appointments are.

Element Name	Manage Not Accomplished Task
Use Case ID	AGEREM.0007
Name	Manage Not Accomplished Task
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)

Change history	
Due date	
Event identifier	
Descriptor	Context: A task has not been accomplished by the user 1. The FLORENCE System detects that a task has not been accomplished on time. 2. The FLORENCE System raises an alarm indicating that the task has not been accomplished 3. The TUC professional receives the alarm on his system 4. The TUC professional tries to perform a telecommunication with Santiago 5. The TUC professional decides whether to call the emergency service or not

Element Name	Perform Telecommunication
Use Case ID	AGEREM.0008
Name	Perform Telecommunication
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: The TUC wants to check why a task has not been carried out 1. The TUC selects the establish communication option from his/her system 2. The FLORENCE system detects if the user is at home or not and selects the best communication mechanism 3. The FLORENCE system starts a telecommunication between the TUC and Santiago 4. The TUC describes to the FLORENCE system what has happened and the decision that has been taken.

Element Name	Call Emergency Service
Use Case ID	AGEREM.0009
Name	Call Emergency Service
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: There's an emergency associated with a not performed task 1. The TUC has not been able to contact Santiago and decides to call the emergency service 2. The TUC uses the FLORENCE system to call the emergency service

	3. The TUC retrieves the relevant data regarding Santiago from the FLORENCE system (e.g, address, important medical data,…) 4. The TUC delivers the relevant data to the emergency service 5. The FLORENCE system logs that an emergency situation has been attended

In Table 14 a reflection on how to expand the AGEREM scenario is included, as well as a very rough estimation of the foreseen technical modifications involved in it.

AGEREM	Additional functionality for scenario expansion	Foreseen technical modification
Use as basis of a medical appointments managing tool for KEETOU's added functionality (see table in 7.1.4)	The data servers and communication channels could be the same but the information to be stored and how to present it should be adequate to the medical context. The information should be presented differently to professionals and users/patients.	Low

Table 14. AGEREM expansion table

5.5 Lifestyle improvement [LIFIMP]

5.5.1 Feasibility check comments (Version B)

USE CASE ID	Name	Modules necessary	Actions to be taken over the use case
LIFIMP.0001	*Measuring Weight*	*Modules foreseen in the project:* - *Sensor System* - *WiFi weighing scale*	None, use case feasible
LIFIMP.0002	*Consulting Florence*	*Modules foreseen in the project:* - *Dialogue Management* - *Robot Control*	None use case feasible
LIFIMP.0003	*Notify User*	*Modules foreseen in the project:* - *Dialogue Management* - *Sensor System* - *Robot Control*	None use case feasible
LIFMIP.0004	*Make Telephone Call*	*Modules foreseen in the project:* - *Dialogue Management* - *Robot Control* - *Video communication*	None, use case feasible
LIFMIP.0005	*Sending Exercise Video*	*Modules foreseen in the project:* - *Dialogue Management* - *File Transfer System*	None, use case feasible
LIFIMP.0006	*Performing Exercises*	*Modules foreseen in the project:* - *Dialogue Management* - *Multi Modal Input*	None, use case feasible

Table 15. AGEREM feasibility check table

5.5.2 After WoOz tests feedback (Version C)

Scenario Use case ID/Name	Relevant WoOz use cases and feedback	Modification to the use cases
LIFIMP.0002/Consulting Florence	*The robot should not be too "pushy" regarding giving advices.*	Add an alternative path: Between item 2 (approach) and item 3 (recommendation), the user should be able to see a screen (possibly part of the default screen of Florence, so the user sees it often), in which health status and progress (achievements, collected rewards) towards (committed) health-related goals, are displayed, such that the AP is informed and motivated to perform an activity or ask for a recommended activity.

Table 16. LIFIMP WoOz impact table

Element name	**Consulting Florence**
Use Case ID *	**LIFIMP.0002**
Name *	Consulting Florence
Version	1
Date	2010-11-26
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The AP consults the robot for a recommended activity to do in the morning.
Priority	Normal
Actors	Assisted Person Robot
Stakeholders	Assisted Person
Basic course of action (path) *	1. The AP enters his kitchen or living. 2. The AP approaches the robot or asks the robot to approach him. 3. The AP asks the robot to provide him a recommended activity for this morning. 4. The AP gives immediate feedback on the recommendation.
Alternate courses of action (path) */2	1. The AP enters his kitchen or living. 2. The AP happens to see the robot's screen and notifies that his health status has dropped. 3. The AP asks the robot to provide him a recommended activity for this morning. 4. The AP gives immediate feedback on the recommendation.
Preconditions *	Enough context needs to be available to come with a proper recommendation.
Triggers	AP aks the robot to come with a recommendation.
Postconditions *	Robot has given the AP a recommended activity.
Error conditions/Exceptions */2	Not enough context available to come with a good suggestion.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

5.5.3 Final scenario and use cases

Thomas is a 75 year old senior whose wife recently passed away. He just woke up and is getting ready for the day in the bathroom. He stands on the scale and the results are being sent to his in home Florence system. Upon entering the kitchen for making breakfast he takes a quick look at the Florence robot's screen and notifies that his health status has dropped slightly. He decides to consults the Florence robot. The robot looks at the latest health records and since it's a sunny day and Thomas has no other appointments in the morning he suggests to take a walk through the park.
After he gets back Thomas notices his hip being stiff again. Luckily his weekly telephone call with his physiotherapist is scheduled for later today. The Florence robot notifies Thomas that it is time for the call. Thomas discusses his stiff hip with the physiotherapist who advises him to do some exercises to improve his stance and ease his hip. The suggested exercises are being sent to the Florence system. Thomas' robot assists him by displaying the exercises on his screen. Since the robot is mobile Thomas can exercise wherever he wants and without needing a physiotherapist, whenever he wants.

Element name	**Measuring weight**
Use Case ID *	**LIFIMP.0001**
Name *	Measuring weight
Version	1
Date	2010-11-26
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The AP stands on his weighing scale, the measured weight is automatically added to his health status log.
Priority	normal
Actors	Elderly person Weighing scale
Stakeholders	Elderly person
Basic course of action (path) *	1. The AP enters his bathroom and stands on his weighing scale 2. The AP is identified 3. AP's weight is being added to his health status log
Alternate courses of action (path) */2	1. The AP enters his bathroom and stands on his weighing scale 2. The AP could not be identified 3. Measurement is being stored for an 'unknown user' 4. The robot asks the AP who 'unknown user' is upon first encounter.
Preconditions *	Weighing scale needs to be connected to the Florence system. User needs to be identifiable preferable by his weight/BFP.
Triggers	AP takes place on his weighing scale
Postconditions *	AP's weight is added to his health status log.
Error conditions/Exceptions */2	AP could not be identified by the weighing scale.

Element name	Measuring weight
Use Case ID *	**LIFIMP.0001**
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Consulting Florence
Use Case ID *	**LIFIMP.0002**
Name *	Consulting Florence
Version	1
Date	2010-11-26
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The AP consults the robot for a recommended activity to do in the morning.
Priority	Normal
Actors	Assisted Person Robot
Stakeholders	Assisted Person
Basic course of action (path) *	1. The AP enters his kitchen or living. 2. The AP approaches the robot or asks the robot to approach him. 3. The AP asks the robot to provide him a recommended activity for this morning. 4. The AP gives immediate feedback on the recommendation.
Alternate courses of action (path) */2	1. The AP enters his kitchen or living. 2. The AP happens to see the robot's screen and notifies that his health status has dropped. 3. The AP asks the robot to provide him a recommended activity for this morning. 4. The AP gives immediate feedback on the recommendation.
Preconditions *	Enough context needs to be available to come with a proper recommendation.
Triggers	AP aks the robot to come with a recommendation.
Postconditions *	Robot has given the AP a recommended activity.
Error conditions/Exceptions */2	Not enough context available to come with a good suggestion.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Notify User
Use Case ID *	**LIFIMP.0003**
Name *	Notify User
Version	1
Date	2010-11-29
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	

Element name	**Notify User**
Use Case ID *	**LIFIMP.0003**
Due date	
Event identifier(s)	
Description *	The robot notifies the AP for either an agenda reminder or to suggest an activity.
Priority	Normal
Actors	Assisted Person Robot
Stakeholders	Assisted Person
Basic course of action (path) *	1. The robot detects the AP being in the same room as him. 2. The robot notifies the AP either visual or audible (whichever is most suited). 3. The AP approaches the robot and confirms he wants to see the notification, either by touch, gesture or voice. 4. The robot shows the reminder or activity suggestion.
Alternate courses of action (path) */2	
Preconditions *	Robot and AP need to be in the same room and either an agenda reminder or activity suggestion needs to be available.
Triggers	Robot detects the user being in the same room.
Postconditions *	Robot has shown the AP a recommended activity or agenda reminder.
Error conditions/Exceptions */2	Robot can't detect the AP.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

Element name	**Make Telephone Call**
Use Case ID *	**LIFIMP.0004**
Name *	Make telephone call
Version	1
Date	2010-11-29
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The AP uses the robot for his weekly telephone call with his physiotherapist.
Priority	Normal
Actors	Assisted Person Robot Physiotherapist
Stakeholders	Assisted Person Physiotherapist
Basic course of action (path) *	1. AP takes place in his chair and orders the robot to approach im. 2. The robot approaches the AP. 3. The robot initiates the video call between the AP and physiotherapist.

Element name	Make Telephone Call
Use Case ID *	**LIFIMP.0004**
	4. Either the AP or the physiotherapist terminates the session as soon as they're done talking.
Alternate courses of action (path) */2	
Preconditions *	AP has taken place in his chair.
Triggers	AP asks the robot to approach him.
Postconditions *	Video call between the AP and physiotherapist has taken place.
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Sending Exercise Video
Use Case ID *	**LIFIMP.0005**
Name *	Sending Exercise Video
Version	1
Date	2010-11-29
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	During the video call the physiotherapist sends an exercise to the AP.
Priority	Normal
Actors	Assisted Person Robot Physiotherapist
Stakeholders	Assisted Person Physiotherapist
Basic course of action (path) *	1. During the video call the AP and his physiotherapist discuss the AP's stiff hip. 2. The physiotherapist sends the AP a video and some accompanying instructions. 3. The video and instructions are stored so the robot can show them at a later time.
Alternate courses of action (path) */2	
Preconditions *	AP and his physiotherapist are having a video call.
Triggers	Physiotherapist sends an exercise video.
Postconditions *	Exercise video and accompanying instructions have been stored for later retrieval.
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Performing Exercises
Use Case ID *	**LIFIMP.0006**

Element name	Performing Exercises
Use Case ID *	**LIFIMP.0006**
Name *	Performing Exercises
Version	1
Date	2010-11-29
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The AP is performing an exercise, given to him by his physiotherapist, with the support of the robot.
Priority	Normal
Actors	Assisted Person Robot
Stakeholders	Assisted Person
Basic course of action (path) *	1. The AP moves the robot to a spot where the robot can show the video to the AP and the AP has enough space to move around and perform the exercise. 2. The robot starts playback of the video. 3. The AP performs the exercise
Alternate courses of action (path) */2	
Preconditions *	An exercise video is available..
Triggers	The AP either asks the robot for an exercise or the robot has suggested the AP to perform an exercise.
Postconditions *	AP has performed the exercise.
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

In Table 17 a reflection on how to expand the LIFIMP scenario is included, as well as a very rough estimation of the foreseen technical modifications involved in it.

LIFIMP	Additional functionality for scenario expansion	Foreseen technical modification
Expansion to rehabilitation context	Medical guidelines need to be implemented in the decision making module. Aforementioned medical management system (see AGEREM) could also be used.	High, it is difficult to make autonomous decisions on medical expertise.

Table 17. LIFIMP expansion table

5.6 Device coach [DEVCOA]

5.6.1 Feasibility check comments (Version B)

Making the device coach scenario extremely usable and satisfactory would mean that problem devices would have to be recognized automatically and that focussing a camera on the problem device to illustrate the problem in a video would have to be automatic or very easy. This would require significant amounts of engineering.

Combined with the rather lukewarm reception of this scenario by users in focus groups, we decided to drop this scenario and focus our efforts on the remaining scenarios.

5.6.2 After WoOz tests feedback (Version C)

The DEVCOA scenario was dropped after the technical feasibility check.

5.6.3 Final scenario and use cases

The DEVCOA scenario was dropped after the technical feasibility check.

5.7 Collaborative gaming [COLGAM]

5.7.1 Feasibility check comments (Version B)

USE CASE ID	Name	Modules necessary	Actions to be taken over the use case
COLGAM.0001	*Start Service*	*Modules foreseen in the project:* *Multimodal communication:* - *Speech synthesis* - *GUI-based communication* - *Yes/No understanding (gesture, GUI,…)* - *Menu-based communication* *Context Management:* - *Contact List access* - *User localization* *Robot service::* - *Robot Navigation* - *Person Approaching* *To be localized:* - *external phone communication (audio, sms)* - *Mailing capacities (send, receive)* - *Website management* *Modules not foreseen in the project:* *Speech recognition, possibly partial command recognition.*	Modify use case*:* Take into account that the user should ask the Florence system to start the activity using GUI-based communication, menu-based communication, or gesture communication (not using voice).
COLGAM.0002	*Pre-accept invitation by telephone*	*Modules foreseen in the project:* *Multimodal communication:* - *information transmission* - *Acknowledgment com.* *Robot Services:* - *navigation* - *person following* *Context Management:* - *Access to Contact List* - *User localization* *COLGAM related components:* - *plane identification*	Modify the use case: Florence may not need to guide the telephone communication, but just make the connection through phone, and then let Susan propose the activity. But this would require, after the call, that Florence system asks to Mary whether or not Susan accepted the proposition.

		To be identified: - *image transmission* - *Remote Website control* - *Videoconferencing* *Multimodal communication:* - *telephone communication through Florence* *Modules not foreseen in the project:* *(Robot) position reach: move to a specific position (best position within the playing table site).*	If Florence makes autonomously the communication, the communication procedure (simple yes/no recognition, or " click on 1" like) needs to be also provided by the multimodal communication layer. To make the robot reach a suitable position first attempts will be to fixed positions around tables and sofas within the house where the activity may take place. This modification will be reflected in how the robot navigation is implemented.
COLGAM.0003	*Accept invitation*	*Modules foreseen in the project:* *Multimodal communication:* - *information transmission* - *Acknowledgment com.* *Robot Services:* - *navigation* - *person following* *Context Management:* - *Access to Contact List* - *User localization* *COLGAM related components:* - *Image plane identification* *To be identified:* - *image transmission* - *Remote Website control* - *Videoconferencing* *Modules not foreseen in the project:* *(Robot) position reach : move to a specific position (best position within the playing table site).*	Modify use case*)* The playing site location might be a fixed position with respect to the localization module. The automatic extraction of the puzzle image is not mandatory within a first integration. The system can just ask Mary to confirm if the recorded image contains the puzzle

COLGAM.0004	*Change viewpoint*	*Modules foreseen in the project:* *Multi-modal interaction:* - *data transmission (position)* *Action triggering:* - *camera control (pan,tilt,zoom…)* *COLGAM specific:* - *camera required position estimation*	Modify use case: The automatic estimation of the best motion of the camera related to a simple image click might be difficult, in particular to control the zooming dimension. Furthermore, a good position would require to know exactly the distance between the table and the camera, information not available. In a first version, the remote GUI may ask the person to directly control the motion direction, instead of just asking a simple position to focus on
COLGAM.0005	*Point area to focus*	*Modules foreseen in the project:* *Multi-modal interaction:* *- pointing gesture recognition* *To be identified:* - *GUI-based interaction (Website)*	None, use case feasible The good observation of the pointing gesture will rely also onto the camera field of view, which depends onto the camera position, but also onto its optical characteristics.
COLGAM.0006	*Share game information*	*Modules foreseen in the project:* *Multi-modal interaction:* - *A/V information delivery* - *Acknowledgment recognition* *COLGAM specific:* - *Website information delivery* - *Website Graphical capacities* *To be identified:* - *Remote image sharing*	Modify use case: Laser pointing will bring safety issues which are difficult to overcome. Laser pointing at eye level could be very dangerous. Furthermore, the laser pointer should be able to move in order to point at several locations. Instead, a picture of the area will be

		Modules not foreseen in the project: *-Laser pointing capabilities*	shown to the local player to illustrate where the remote player wants Mary to focus.
COLGAM.0007	*Suggest new event*	*Modules foreseen in the project:* *Multi-modal interaction:* - *Visual / Audio information delivery* *COLGAM specifc:* *" Activity recognition"*	None, use case feasible The detection of the "activity recognition" might be implemented as a combination of visual activity (motion detected into the image), and / or by detecting few vocal exchange within the videoconference. The second possibility might be more problematic to implement.
COLGAM.0008	*Close service*	*Modules foreseen in the project:* *Multi-modal interaction:* - *Visual / Audio information delivery* - *Acknowledgment recognition* - *To be identified:* - *GUI-based interaction (Website* -	None, use case feasible

Table 18. COLGAM feasibility check table

New versions of the use cases that need to be modified after feasability check:

Element name	**Start service**
Use Case ID *	**COLGAM.0001**
Name *	Ask to take part in a collaborative activity
Version	2
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia leire.martinez@tecnalia.com)
Change history [Optional]	1. Mary asks to play with Susan using GUI-based communication or gesture communication (voice limited to vocal commands) 2. Mary asks to play with anyone associated with/linked to her using GUI-based communication or gesture communication (voice limited to vocal

Element name	Start service
Use Case ID *	**COLGAM.0001**
	commands)
Due date	
Event identifier(s)	1. Mary informs Florence that she wants to start a collaborative activity using GUI-based communication or gesture communication (voice limited to vocal commands) 2. Florence asks Mary which activity she wants to join. 3. Mary asks Florence for a puzzle 4. Florence asks Mary who she wants to play with 5. Mary asks Florence to play with Susan 6. Florence contacts Susan 7. Susan receives Mary's invitation (PC, phone) 8. Accept invitation (COLGAM.0003) or pre-accept the invitation (COLGAM.0002) use cases will be executed.
Description *	Florence system helps Mary to get in touch with Susan to start a collaborative gaming
Priority	1
Actors	Mary and Susan (the users) Florence
Stakeholders	Mary: asks Florence to start the service Susan: she receives Mary's invitation
Basic course of action (path) *	1. Mary requests to start a collaborative activity with Susan
Alternate courses of action (path) */2	1. Susan requests Florence website to ask Mary if she would like to start a collaborative activity. Florence gets in contact with Mary and proposes her the activity. Mary accepts Susan's invitation using GUI-based communication or gesture communication (voice limited to vocal commands) 2. Florence might let Mary, through a telephone connection, propose the activity to Susan. 3. Florence detects that Mary did not use this service for long, so Florence suggests Mary to start the service.
Preconditions *	Mary is not involved within another service Florence robot is not used by another service
Triggers	Mary asks Florence to join in a collaborative activity
Postconditions *	Florence proposed Susan to start a collaborative activity
Error conditions/Exceptions */2	1. Florence cannot contact Susan: tells Mary that Susan is not available, proposes to contact another person or to close the service.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	Invite User (internal)
Assumptions (Optional)	The collaborative activity has been started correctly

Element name	Pre-accept invitation by telephone
Use Case ID *	**COLGAM.0002**
Name *	Prepare all the components to start the playing activity, send the request to Susan by phone and Susan accepts the invitation by phone.

Element name	**Pre-accept invitation by telephone**
Use Case ID *	**COLGAM.0002**
Version	1
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Florence system proposes Susan by phone to start the collaborative activity 2. Susan pre-accepts to start the activity 3. The Florence robot tells Mary that Susan has pre-accepted the invitation by phone 4. The Florence robot joins the playing site
Description *	Susan receives a phone call from Florence to invite her to start a collaborative activity. Mary and the Florence robot move to the playing site
Priority	2
Actors	Susan (user)
Stakeholders	Susan: she receives a phone call from Florence and accepts the invitation Florence: moves to the playing site if it is needed
Basic course of action (path) *	1. Mary asks to Florence to make a puzzle and contact Susan 2. Florence contacts Susan by phone
Alternate courses of action (path) */2	None
Preconditions *	Complete use case COLGAM.0001
Triggers	
Postconditions *	Florence robot is at the playing site, as well as Mary
Error conditions/Exceptions */2	1. The Florence robot is not able to reach the playing site: Florence informs Mary, and asks her to direct the robot. 2. Mary is not reaching the playing site: check her position in the home. 3. The connection with Susan is not possible. Inform Mary.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	Invite user (internal)
Included use cases (Optional)	Robot to playing site (internal)
Assumptions (Optional)	Mary and Susan are ready to play

Element name	**Accept invitation**
Use Case ID *	**COLGAM.0003**
Name *	Prepare all the components to start the playing activity: accept the invitation through Florence or using the Florence remote website, then choose the puzzle *(any activity could be described)*To accept the invitation the users should previously move to the playing site previously fixed (to the computer or to next to the Florence robot)
Version	2
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	

Element name	Accept invitation
Use Case ID *	**COLGAM.0003**
Due date	
Event identifier(s)	1. Florence system proposes Mary to reach the playing site. 2. The Florence robot joins the playing site previously fixed 3. Susan connects to the Florence Website, confirming acceptance to join in the collaborative activity. 4. The Florence robot launches the videoconferencing with Susan 5. Mary chooses a physical puzzle 6. Florence robot asks Mary to show the drawing 7. Florence robot camera detects it and keeps the corresponding image in memory 8. Florence presents the image to Mary 9. Mary confirms that the image that Florence robot camera detects is correct 10. Florence Website presents the image to Susan
Description *	Mary and the Florence robot move to the playing site previously fixed, and Susan connect to the Florence Website. While the videoconference connection with Susan is done, Mary chooses the puzzle she wants to make. The Florence robot remembers the view of the drawing in order to present it to Susan when needed.
Priority	2
Actors	Mary and Susan (the users)
Stakeholders	Mary: she chooses a puzzle and shows it to Florence robot. Susan: she is able to visualize the image of the drawing to be done Florence: moves to the playing site if it is needed
Basic course of action (path) *	1. Mary ask to Florence for making a puzzle and contact Susan 2. Florence contacts Susan 3. Florence proposes to Susan for making a puzzle by phone 4. Susan pre-accepts the invitation connecting to the Florence Website 5. Florence proposes to Mary to choose a puzzle 6. Florence moves to the playing site which has been previously fixed
Alternate courses of action (path) */2	1. Make a Sudoku, Cross-words, … Florence robot sends to Susan a view of the paper onto which is locate the game. 2. Play Chess or Dame: show the location of the game 3. Play domino or cards: Florence robot provides to Susan a view of the game place (to be defined, and surely changed), as well as a view of her cards/ tiles.
Preconditions *	Complete use case COLGAM.0001 Susan and Mary accepted to play together
Triggers	
Postconditions *	Florence has memorized the drawing of the puzzle
Error conditions/Exceptions */2	1. The Florence robot is not able to reach the playing

Element name	Accept invitation
Use Case ID *	**COLGAM.0003**
	site: inform Mary, and ask her to direct it. 2. Mary is not reaching the playing site: check her position in the home. 3. The connection with Susan is not possible or Susan didn't accept the invitation. Inform Mary. 4. Florence cannot see properly the drawing: ask Mary to show him the drawing again 5. Florence cannot transmit the image of the puzzle to Susan. Inform Mary of the communication problem, and try to phone her. If error is persistent, quit game and notify it to the user, or try to contact another player, if Mary agrees on it.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0002 – Pre-accept invitation by phone Invite user (internal)
Included use cases (Optional)	Robot to playing site (internal)
Assumptions (Optional)	Mary and Susan are ready to play

Element name	Change viewpoint
Use Case ID *	**COLGAM.0004**
Name *	Change remotely the viewpoint of the robot. Before moving the viewpoint the robot should memorize the current viewpoint.
Version	2
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Susan wants to see an area that is currently out of the camera's scope 2. Susan requests Florence robot to move its camera controlling herself the motion of the camera 3. Florence Website memorizes the current camera position 4. Florence Robot moves its camera 5. Florence waits for more instructions
Description *	Susan wants to see a different area of the table to have a different view.
Priority	4
Actors	Susan (the user) Camera of Florence robot
Stakeholders	Susan: she gives the instructions to Florence to change the viewpoint Florence robot: it moves its camera
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence 2. Susan wants to change its field of view
Alternate courses of action (path) */2	1. In other collaborative activities: Susan needs to see something that is out of the field of view of Florence robot camera 2. Move the camera or the robot to a previously memorized location. 3. Susan may click on the image to define the area to

Element name	Change viewpoint
Use Case ID *	**COLGAM.0004**
	move to.
Preconditions *	Susan and Mary are playing together. In the case that Florence has to move to a previous position this needs to be memorized beforehand.
Triggers	Susan requests to change the viewpoint of Florence robot camera
Postconditions *	The Florence camera is showing a different part of the table set.
Error conditions/Exceptions */2	1. The Florence robot can not realize the specified motion: it informs Susan that this movement is not possible 2. There's no position that has been previously recorded: informs Susan and proposes here either to store the current position, or to manually move the camera.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0007 – Suggest new event
Included use cases (Optional)	Move camera (internal)
Assumptions (Optional)	Florence robot's camera is showing the part of the table that Susan wanted

Element name	Share game information
Use Case ID *	**COLGAM.0006**
Name *	Share information about the collaborative activity
Version	2
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Susan asks Florence Website to send her current view to Mary 2. Florence proposes Susan to add some graphical element (points, circle, rectangle) 3. Susan adds graphical information and validates 4. Florence shows Mary the tagged image onto the Robot Touch screen 5. Florence waits for new instructions
Description *	Susan wants to indicate a specific area to Mary. Florence transmits to Mary this information through the delivery of an image
Priority	6
Actors	Susan and Mary (the users) Florence: camera, screen, laser pointer
Stakeholders	Susan: she selects an area Florence: Website sends the tagged image, the robot touchscreen displays this image
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence 2. Susan wants to focus in a specific area
Alternate courses of action (path) */2	1. Susan defines an area of interest to Mary 2. In a Sudoku, Crossword, … Susan can propose a solution for this area. This would add the following event:

Element name	Share game information
Use Case ID *	**COLGAM.0006**
	a) Susan proposes a solution b) Florence tells Mary the solution for the given area c) Mary uses the solution
Preconditions *	Susan and Mary are playing together.
Triggers	Susan points remotely an area on the table
Postconditions *	Florence robot displays the image in its touchscreen
Error conditions/Exceptions */2	1. Susan does not validate the image to send: remind it to Susan and propose to cancel the action.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0004 – Change viewpoint COLGAM.0005 – Point area to focus
Included use cases (Optional)	
Assumptions (Optional)	Florence displays the image in its touch screen

5.7.2 After WoOz tests feedback (Version C)

Scenario Use case ID/Name	Relevant WoOz aspects and feedback	Modification to the use cases
COLGAM.0001 / Start Service	*Interaction – Voice control: Users liked the voice control. Even the voice control is working, a touch screen is desired as well (DE)* *Interaction – Touch Screen: it was fine. The use of smiley to show emotions was considered to be good.*	
COLGAM.0002 / Pre-accept invitation by telephone	*Interaction – Voice control: Users liked the voice control. Even the voice control is working, a touch screen is desired as well (DE)*	Florence shouldn't move by itself. It should wait until user asks for it. Use Case should be modified.
COLGAM.0003 / Accept Invitation	*Movement – Approach: Users prefer using voice commands (NL)* *Movement – Follow: Users don't like Florence move by itself. They want to control it (ES, NL, DE)* *Interaction – Siting: Screen should be oriented on the side of the chair, and the height of the screen must be adaptable (ES) The height of screen and distance was fine. Touch to confirm messages, fine (NL)* *Interaction – Standing: Most users chose voice commands rather than touch. The screen was considered large enough for video to be visible from 2 m. (NL)* *Interaction – Lying: the main way to communicate from this position should be through voice (ES)* *Interaction – Voice control: Users liked the voice control. Even the voice control*	Florence shouldn't move by itself. It should wait until user asks for it. Use case should be modified.

	is working, a touch screen is desired as well (DE) *Interaction – Touch Screen: it was fine. The use of smiley to show emotions was considered to be good.*	
COLGAM.0004 / Change Viewpoint	*Interaction – Touch Screen: it was fine. The use of smiley to show emotions was considered to be good.*	
COLGAM.0005 / Point area to focus	*Orientation – Voice: It was fine (NL)* *Orientation – Gesture: It was fine (ES, NL)*	
COLGAM.0006 / Share game information	*Interaction – Siting: Screen should be oriented on the side of the chair, and the height of the screen must be adaptable (ES) The height of screen and distance was fine. Touch to confirm messages, fine (NL)* *Interaction – Standing: Most users chose voice commands rather than touch. The screen was considered large enough for video to be visible from 2 m. (NL)* *Interaction – Lying: the main way to communicate from this position should be through voice (ES)* *Interaction – Touch Screen: it was fine. The use of smiley to show emotions was considered to be good.*	
COLGAM.0007 / Suggest new event	*Interaction – Siting: Screen should be oriented on the side of the chair, and the height of the screen must be adaptable (ES) The height of screen and distance was fine. Touch to confirm messages, fine (NL)* *Interaction – Standing: Most users chose voice commands rather than touch. The screen was considered large enough for video to be visible from 2 m. (NL)* *Interaction – Lying: the main way to communicate from this position should be through voice (ES)* *Interaction – Voice control: Users liked the voice control. Even the voice control is working, a touch screen is desired as well (DE)* *Interaction – Touch Screen: it was fine. The use of smiley to show emotions was considered to be good.*	

COLGAM.0008 / Close Service	*Orientation – Voice: It was fine (NL)* *Orientation – Gesture: It was fine (ES, NL)* *Interaction – Siting: Screen should be oriented on the side of the chair, and the height of the screen must be adaptable (ES) The height of screen and distance was fine. Touch to confirm messages, fine (NL)* *Interaction – Standing: Most users chose voice commands rather than touch. The screen was considered large enough for video to be visible from 2 m. (NL)* *Interaction – Lying: the main way to communicate from this position should be through voice (ES)* *Interaction – Voice control: Users liked the voice control. Even the voice control is working, a touch screen is desired as well (DE)* *Interaction – Touch Screen: it was fine. The use of smiley to show emotions was considered to be good.*	

Table 19. COLGAM WoOz impact table

New versions of the use cases that need to be modified after WoOz tests:

Element name	**Pre-accept invitation by telephone**
Use Case ID *	**COLGAM.0002**
Name *	Prepare all the components to start the playing activity, send the request to Susan by phone and Susan accepts the invitation by phone.
Version	1
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Florence system proposes Susan by phone to start the collaborative activity 2. Susan pre-accepts to start the activity 3. The Florence robot tell to Mary that Susan has pre-accepted the invitation by phone 4. The Florence robot waits until Mary asks to him to join the playing site and then Florence robot moves to the playing site
Description *	Susan receives a phone call from Florence to invite her

Element name	Pre-accept invitation by telephone
Use Case ID *	**COLGAM.0002**
	to start a collaborative activity. Mary and the Florence robot move to the playing site when Mary asks for it
Priority	2
Actors	Susan (user)
Stakeholders	Susan: she receives a phone call from Florence and accepts the invitation Florence: moves to the playing site when Mary asks for it
Basic course of action (path) *	1. Mary asks to Florence to make a puzzle and contact Susan 2. Florence contacts Susan by phone
Alternate courses of action (path) */2	None
Preconditions *	Complete use case COLGAM.0001
Triggers	
Postconditions *	Florence robot is at the playing site, as well as Mary
Error conditions/Exceptions */2	1. The Florence robot is not able to reach the playing site: Florence informs Mary, and asks her to direct the robot again. 2. Mary is not reaching the playing site: check her position in the home. 3. The connection with Susan is not possible. Inform Mary.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	Invite user (internal)
Included use cases (Optional)	Robot to playing site (internal)
Assumptions (Optional)	Mary and Susan are ready to play

Element name	Accept invitation
Use Case ID *	**COLGAM.0003**
Name *	Prepare all the components to start the playing activity: accept the invitation through Florence or using the Florence remote website, then choose the puzzle *(any activity could be described)*To accept the invitation the users should previously move to the playing site previously fixed (to the computer or to next to the Florence robot)
Version	2
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Florence system proposes Mary to reach the playing site. 2. The Florence robot joins the playing site previously fixed when Mary asks for it 3. Susan connects to the Florence Website, confirming acceptance to join in the collaborative activity. 4. The Florence robot launches the videoconferencing with Susan 5. Mary chooses a physical puzzle 6. Florence robot asks Mary to show the drawing

Element name	Accept invitation
Use Case ID *	**COLGAM.0003**
	7. Florence robot camera detects it and keeps the corresponding image in memory 8. Florence present the image to Mary 9. Mary confirms that the image that Florence robot camera detects is correct 10. Florence Website presents the image to Susan
Description *	Mary and the Florence robot move to the playing site previously fixed, and Susan connect to the Florence Website. While the videoconference connection with Susan is done, Mary chooses the puzzle she wants to make. The Florence robot remembers the view of the drawing in order to present it to Susan when needed.
Priority	2
Actors	Mary and Susan (the users)
Stakeholders	Mary: she chooses a puzzle and shows it to Florence robot. Susan: she is able to visualize the image of the drawing to be done Florence: moves to the playing site if it is needed when Mary asks for it
Basic course of action (path) *	1. Mary ask to Florence for making a puzzle and contact Susan 2. Florence contacts Susan 3. Florence proposes to Susan for making a puzzle by phone 4. Susan pre-accept the invitation by phone 5. Susan accept the invitation connecting to the Florence Website 6. Florence proposes to Mary to choose a puzzle 7. Florence moves to the playing site previously fixed when Mary asks for it
Alternate courses of action (path) */2	1. Make a Sudoku, Cross-words, … Florence robot sends to Susan a view of the paper onto which is locate the game. 2. Play Chess or Dame: show the location of the game 3. Play domino or cards: Florence robot provides to Susan a view of the game place (to be defined, and surely changed), as well as a view of her cards/ tiles.
Preconditions *	Complete use case COLGAM.0001 Susan and Mary accepted to play together
Triggers	
Postconditions *	Florence has memorized the drawing of the puzzle
Error conditions/Exceptions */2	1. The Florence robot is not able to reach the playing site: inform Mary, and ask her to direct it again. 2. Mary is not reaching the playing site: check her position in the home. 3. The connection with Susan is not possible or Susan didn't accept the invitation. Inform Mary. 4. Florence cannot see properly the drawing: ask Mary to show him the drawing again 5. Florence cannot transmit the image of the puzzle to Susan. Inform Mary of the communication problem, and try to phone her. If error is persistent, quit

Element name	Accept invitation
Use Case ID *	**COLGAM.0003**
	game and notify it to the user, or try to contact another player, if Mary agrees on it.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0002 – Pre-accept invitation by phone Invite user (internal)
Included use cases (Optional)	Robot to playing site (internal)
Assumptions (Optional)	Mary and Susan are ready to play

5.7.3 Final scenario and use cases

Mary is at her place, ready to start making one of her favourite activities: making puzzles. She has chosen a big and challenging one.

Unfortunately, her friend Susan isn't with her; it is a pity. Mary and Susan love to make puzzles together. They both feel part of a good team. Mary is very patient and can play for long hours while Susan is good at spotting an specific tile. They are proud of having been able to make a 1000-tile puzzle together last winter.

These last months Susan is suffering from arthritis, so she is not as mobile as she used to and can not visit her friend as often as she would like to. Today, is one of those days, but not to worry!, the Florence system that Mary owns, will make it possible that they can continue with this activity remotely.

Mary places all the puzzle tiles and the cover with the reference image on a table. The Florence system connects her with Susan, who is able to see and hear what's going on with the puzzle. If Mary requires the Florence system goes around the working surface to show different views, and zooms in and out as requested by Susan. She gives indications to Mary on the appropriate tiles for the difficult sections that Mary by herself is not able to fix. Mary takes into account Susan's indications and places tiles correctly. Meanwhile, they can chat as usual.

After an hour, they both are happy to see that the work progresses correctly and a small but difficult part of the puzzle is already done. They agree to continue with this funny and entertaining activity tomorrow.

Element name	Start service
Use Case ID *	**COLGAM.0001**
Name *	Ask to take part in a collaborative activity
Version	2
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia leire.martinez@tecnalia.com)
Change history [Optional]	1. Mary asks to play with Susan using GUI-based communication or gesture communication (not using voice) 2. Mary asks to play with anyone associated with/linked to her using GUI-based communication or gesture communication (not using voice)

Element name	Start service
Use Case ID *	**COLGAM.0001**
Due date	
Event identifier(s)	1. Mary informs Florence that she wants to start a collaborative activity using GUI-based communication or gesture communication (not using voice). 2. Florence asks Mary which activity she wants to join. 3. Mary asks Florence for a puzzle 4. Florence asks Mary who she wants to play with 5. Mary asks Florence to play with Susan 6. Florence contacts Susan 7. Susan receives Mary's invitation (PC, phone) 8. Accept invitation (COLGAM.0003) or pre-accept the invitation (COLGAM.0002) use cases will be executed.
Description *	Florence system helps Mary to get in touch with Susan to start a collaborative gaming
Priority	1
Actors	Mary and Susan (the users) Florence
Stakeholders	Mary: asks Florence to start the service Susan: she receives Mary's invitation
Basic course of action (path) *	1. Mary requests to start a collaborative activity with Susan
Alternate courses of action (path) */2	1. Susan requests Florence website to ask Mary if she would like to start a collaborative activity. Florence gets in contact with Mary and proposes her the activity. Mary accepts Susan's invitation using GUI-based communication or gesture communication (not using voice) 2. Florence might let Mary, through a telephone connection, propose the activity to Susan. 3. Florence detects that Mary did not use this service for long, so Florence suggests Mary to start the service.
Preconditions *	Mary is not involved within another service Florence robot is not used by another service
Triggers	Mary asks Florence to join in a collaborative activity
Postconditions *	Florence proposed Susan to start a collaborative activity
Error conditions/Exceptions */2	1. Florence cannot contact Susan: tells Mary that Susan is not available, proposes to contact another person or to close the service.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	Invite User (internal)
Assumptions (Optional)	The collaborative activity has been started correctly

Element name	Pre-accept invitation by telephone
Use Case ID *	**COLGAM.0002**
Name *	Prepare all the components to start the playing activity, send the request to Susan by phone and Susan accepts the invitation by phone.
Version	1

Element name	Pre-accept invitation by telephone
Use Case ID *	**COLGAM.0002**
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Florence system proposes Susan by phone to start the collaborative activity 2. Susan pre-accepts to start the activity 3. The Florence robot tell to Mary that Susan has pre-accepted the invitation by phone 4. The Florence robot waits until Mary asks to him to join the playing site and then Florence robot moves to the palying site
Description *	Susan receives a phone call from Florence to invite her to start a collaborative activity. Mary and the Florence robot move to the playing site when Mary asks for it
Priority	2
Actors	Susan (user)
Stakeholders	Susan: she receives a phone call from Florence and accepts the invitation Florence: moves to the playing site when Mary asks for it
Basic course of action (path) *	1. Mary asks to Florence to make a puzzle and contact Susan 2. Florence contacts Susan by phone
Alternate courses of action (path) */2	None
Preconditions *	Complete use case COLGAM.0001
Triggers	
Postconditions *	Florence robot is at the playing site, as well as Mary
Error conditions/Exceptions */2	1. The Florence robot is not able to reach the playing site: Florence informs Mary, and asks her to direct the robot again. 2. Mary is not reaching the playing site: check her position in the home. 3. The connection with Susan is not possible. Inform Mary.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	Invite user (internal)
Included use cases (Optional)	Robot to playing site (internal)
Assumptions (Optional)	Mary and Susan are ready to play

Element name	Accept invitation
Use Case ID *	**COLGAM.0003**
Name *	Prepare all the components to start the playing activity: accept the invitation through Florence or using the Florence remote website, then choose the puzzle *(any activity could be described)*To accept the invitation the users should previously move to the playing site previously fixed (to the computer or to next to the Florence robot)
Version	2
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)

Element name	**Accept invitation**
Use Case ID *	**COLGAM.0003**
Change history [Optional]	
Due date	
Event identifier(s)	1. Florence system proposes Mary to reach the playing site. 2. The Florence robot joins the playing site previously fixed when Mary asks for it 3. Susan connects to the Florence Website, confirming acceptance to join in the collaborative activity. 4. The Florence robot launches the videoconferencing with Susan 5. Mary chooses a physical puzzle 6. Florence robot asks Mary to show the drawing 7. Florence robot camera detects it and keeps the corresponding image in memory 8. Florence present the image to Mary 9. Mary confirms that the image that Florence robot camera detects is correct 10. Florence Website presents the image to Susan
Description *	Mary and the Florence robot move to the playing site previously fixed, and Susan connect to the Florence Website. While the videoconference connection with Susan is done, Mary chooses the puzzle she wants to make. The Florence robot remembers the view of the drawing in order to present it to Susan when needed.
Priority	2
Actors	Mary and Susan (the users)
Stakeholders	Mary: she chooses a puzzle and shows it to Florence robot. Susan: she is able to visualize the image of the drawing to be done Florence: moves to the playing site if it is needed when Mary asks for it
Basic course of action (path) *	1. Mary ask to Florence for making a puzzle and contact Susan 2. Florence contacts Susan 3. Florence proposes to Susan for making a puzzle by phone 4. Susan pre-accept the invitation by phone 5. Susan accept the invitation connecting to the Florence Website 6. Florence proposes to Mary to choose a puzzle 7. Florence moves to the playing site previously fixed when Mary asks for it
Alternate courses of action (path) */2	1. Make a Sudoku, Cross-words, … Florence robot sends to Susan a view of the paper onto which is locate the game. 2. Play Chess or Dame: show the location of the game 3. Play domino or cards: Florence robot provides to Susan a view of the game place (to be defined, and surely changed), as well as a view of her cards/ tiles.
Preconditions *	Complete use case COLGAM.0001 Susan and Mary accepted to play together

Element name	Accept invitation
Use Case ID *	**COLGAM.0003**
Triggers	
Postconditions *	Florence has memorized the drawing of the puzzle
Error conditions/Exceptions */2	1. The Florence robot is not able to reach the playing site: inform Mary, and ask her to direct it again. 2. Mary is not reaching the playing site: check her position in the home. 3. The connection with Susan is not possible or Susan didn't accept the invitation. Inform Mary. 4. Florence cannot see properly the drawing: ask Mary to show him the drawing again 5. Florence cannot transmit the image of the puzzle to Susan. Inform Mary of the communication problem, and try to phone her. If error is persistent, quit game and notify it to the user, or try to contact another player, if Mary agrees on it.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0002 – Pre-accept invitation by phone Invite user (internal)
Included use cases (Optional)	Robot to playing site (internal)
Assumptions (Optional)	Mary and Susan are ready to play

Element name	Change viewpoint
Use Case ID *	**COLGAM.0004**
Name *	Change remotely the viewpoint of the robot. Before moving the viewpoint the robot should memorize the current viewpoint.
Version	2
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Susan wants to see an area that is currently out of the camera's scope 2. Susan requests Florence robot to move its camera controlling the motion of the camera 3. Florence Website memorizes the current camera position 4. Florence Robot moves its camera 5. Florence waits for more instructions
Description *	Susan wants to see a different area of the table to have a different view.
Priority	4
Actors	Susan (the user) Camera of Florence robot
Stakeholders	Susan: she gives the instructions to Florence to change the viewpoint Florence robot: it moves its camera
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence 2. Susan wants to change its field of view
Alternate courses of action (path) */2	1. In other collaborative activities: Susan needs to see something that is out of the field of view of Florence robot camera

Element name	Change viewpoint
Use Case ID *	**COLGAM.0004**
	2. Move the camera or the robot to a previously memorized location. 3. Susan may click on the image to define the area to move to.
Preconditions *	Susan and Mary are playing together. In the case that Florence has to move to a previous position this needs to be memorized beforehand.
Triggers	Susan requests to change the viewpoint of Florence robot camera
Postconditions *	The Florence camera is showing a different part of the table set.
Error conditions/Exceptions */2	1. The Florence robot can not realize the specified motion: it informs Susan that this movement is not possible 2. There's no position that has been previously recorded: informs Susan and proposes here either to store the current position, or to manually move the camera.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0007 – Suggest new event
Included use cases (Optional)	Move camera (internal)
Assumptions (Optional)	Florence robot's camera is showing the part of the table that Susan wanted

Element name	Point area to focus on
Use Case ID *	**COLGAM.0005**
Name *	Make zoom with the camera in a specific area the user pointed at.
Version	2
Date	2010/12/02
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Mary points a location on the table 2. Florence's robot detects this pointing action 3. Florence robot zooms with its camera on that location 4. Florence robot waits for new instructions
Description *	Mary indicates (with her hand) a region of interest and the Florence robot provides to Susan the functionality to automatically adapt the camera position and zooming in order to better observe this area.
Priority	5
Actors	Mary (the user) Susan (the user) Florence robot's camera
Stakeholders	Mary: she points an area in the game Susan: authorize the robot to zoom on the proposed location Florence: detects the pointing, and focus its camera onto that area
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence

Element name	Point area to focus on
Use Case ID *	**COLGAM.0005**
	2. Mary wants to specify a specific area to Susan
Alternate courses of action (path) */2	None
Preconditions *	Susan and Mary are playing together.
Triggers	Mary points a location in the table
Postconditions *	The Florence camera is showing a different part of the table set-
Error conditions/Exceptions */2	1. Florence has not realized that Mary is pointing: no solution
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0007 – Suggest new event
Included use cases (Optional)	Move camera (internal)
Assumptions (Optional)	The Florence camera is focused on the location that Mary pointed

Element name	Share game information
Use Case ID *	**COLGAM.0006**
Name *	Share information about the collaborative activity
Version	2
Date	2011/01/04
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Susan asks Florence Website to send her current view to Mary 2. Florence proposes Susan to add some graphical element (points, circle, rectangle) 3. Susan adds graphical information and validates 4. Florence shows Mary the tagged image onto the Robot Touch screen 5. Florence waits for new instructions
Description *	Susan wants to indicate a specific area to Mary. Florence transmits to Mary this information through the delivery of an image
Priority	6
Actors	Susan and Mary (the users) Florence: camera, screen, laser pointer
Stakeholders	Susan: she selects an area Florence: Website sends the tagged image, the robot touchscreen displays this image
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence 2. Susan wants to focus in a specific area
Alternate courses of action (path) */2	1. Susan defines an area of interest to Mary 2. In a Sudoku, Crossword, … Susan can propose a solution for this area. This would add the following event: d) Susan proposes a solution e) Florence tells Mary the solution for the given area f) Mary uses the solution
Preconditions *	Susan and Mary are playing together.

Element name	Share game information
Use Case ID *	**COLGAM.0006**
Triggers	Susan points remotely an area on the table
Postconditions *	Florence robot displays the image in its touchscreen
Error conditions/Exceptions */2	1. Susan does not validate the image to send: remind it to Susan and propose to cancel the action.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0004 – Change viewpoint COLGAM.0005 – Point area to focus
Included use cases (Optional)	
Assumptions (Optional)	Florence displays the image in its touch screen

Element name	Suggest new event
Use Case ID *	**COLGAM.0007**
Name *	Florence proposes the users to continue collaborating
Version	2
Date	2010/12/02
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Mary and Susan did not collaborate for a long time 2. Florence detects it 3. Florence proposes Mary and Susan to continue playing 4. Mary or Susan make a change in the game 5. Florence is aware of the change 6. Florence starts counting time (to know how long is from one event to next one) 7. Florence waits for new instructions
Description *	Dynamizing the game
Priority	7
Actors	Florence
Stakeholders	Florence: is aware than no changes took place for a long time and suggests to continue playing Mary/Susan: make a change in the game
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence 2. There are no changes in the game since a long time
Alternate courses of action (path) */2	1. Susan or Mary have problems to continue the game: Florence should detect that they cannot continue by themselves and has to help them. Then go to step 2.
Preconditions *	Susan and Mary are playing a collaborative game using Florence, but there have been no changes since a long time
Triggers	Florence understands that the game is continuing
Postconditions *	Florence detects changes in the game from Mary or Susan
Error conditions/Exceptions */2	1. Florence does not receive any answer or change from Susan or Mary for a while: try it again (go to step 1) 2. Florence does not receive any answer or change from Susan or Mary for three times: stop the service (go to COLGAM.0008)

Element name	Suggest new event
Use Case ID *	**COLGAM.0007**
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	Mary or Susan make changes in the game

Element name	Close service
Use Case ID *	**COLGAM.0008**
Name *	Finish the game
Version	2
Date	2010/12/02
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Mary tells Florence that she wants to quit the game 2. Florence tells Susan that Mary wants to quit the game 3. Susan acknowledges it onto Florence website. 4. Florence stops the videoconference connection 5. Florence stops the service
Description *	The game is finished
Priority	3
Actors	Mary and Susan (the users)
Stakeholders	Mary: she asks to quit the service Florence: closes the videoconference connection, and then finishes the service
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence
Alternate courses of action (path) */2	1. Susan wants to finish the game: Florence informs Mary about this, Mary agrees and then Florence goes to step 4 2. Susan wants to finish the game: Florence informs Mary about this, Mary would like to continue, so Florence tries to suggest other people Mary can collaborate with.
Preconditions *	Susan and Mary are playing a collaborative game using Florence
Triggers	Mary wants to finish the game
Postconditions *	Florence informs both users and the connection and the service are stopped
Error conditions/Exceptions */2	1. Florence cannot inform Susan: inform Mary about it and send the message to Susan later 2. Susan does not answer to Florence for a while: inform Mary about it and send the message to Susan later
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0007 – Suggest new event
Included use cases (Optional)	
Assumptions (Optional)	The connection and the service are stopped

In Table 20 a reflection on how to expand the COLGAM scenario is included, as well as a very rough estimation of the foreseen technical modifications involved in it.

COLGAM	Additional functionality for scenario expansion	Foreseen technical modification
Myriad of activities	Increase number of activities (games and others)	Depending on defined activity could range from low to high.
Better understanding and collaboration between the two parties.	Projection capabilities and augmented reality.	Medium
Physically active activities (tennis).	Quick, precise mobile positioning. Manipulation capabilities or good simulation systems	Very high

Table 20. COLGAM expansion table

5.8 Logging system [LOGSYS]

5.8.1 Feasibility check comments (Version B)

USE CASE ID	Name	Modules necessary	Actions to be taken over the use case
0001	*See loged data*	*Modules foreseen in the project: -display interface*	None, use case feasible
0002,0008	*See loged data remotely, disconnect from service*	*Modules foreseen in the project: -remote interface to robot*	None, use case feasible
0003-0007	*Check data*	*Modules foreseen in the project: -display interface*	None, use case feasible

Table 21. LOGSYS feasibility check table

5.8.2 After WoOz tests feedback (Version C)

Scenario Use case ID/Name	Relevant WoOz aspects and feedback	Modification to the use cases
0001	*Approach the user*	Do not approach nearer than 50cm.
0003-0007	*Show information on display*	Display should be large enough to make text readable.

Table 22. LOGSYS WoOz impact table

5.8.3 Final scenario and use cases

Tom had a knee surgery two months ago. He has recovered well but to support the rehabilitation his doctor has created some exercises to train his muscles. He is using a recumbent bike for that. Tom is aware that, unless he recovers totally from the surgery, he won´t be as stable as he was and could have high risk of falling. He is worried about it., but happy to own a Florence robot which will monitor his rehabilitation progression, assess his mobility and even collect his subjective opinion on his health status.

Tom trains regularly, and the Florence Robot collects the data from the training bicycle and gives an overview of the training status. The doctor checks this status once a week to have a look if everything works fine. He should not completely stop the training to keep her muscles strong enough. Even if the doctor considers rehabilitation progression is good, Tom is sceptic about it. The knee sometimes hurts and he doesn´t still have the range of motion he had to. He wants the doctor also know about it, so he logs his impressions in the Florence system, so that the doctor can also check how he feels.

Tom is also aware that his risk of falling is getting higher. So he is pleased that the robot is monitoring his gait velocity and with these results his physiotherapy can be adopted and the caregiver personnel can react accordingly. One day, his assessment values have reached a critical value. So his care givers are advised by the robot to move some of the flowers from the corridor to the corner of the living room, where the risk of falling over it is much lower.

Element name	**See logged data**
Use Case ID *	**LOGSYS.0001**
Name *	User wants to view logged data
Version	1
Date	2010-11-12
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The user wants to check the status of his training progress, health data or monitoring data.
Priority	normal
Actors	Elderly person Florence Robot
Stakeholders	Elderly person
Basic course of action (path) *	1. The user approaches the robot, instructs to show the training data
Alternate courses of action (path) */2	
Preconditions *	Robot service is available (no alarms present etc.)
Triggers	User chooses application from the robot software
Postconditions *	Data is displayed
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	

Element name	See logged data
Use Case ID *	LOGSYS.0001
Included use cases (Optional)	
Assumptions (Optional)	Only few number of people have access to this data, not everyone that approaches the robot

Element name	See loged data remotely
Use Case ID *	LOGSYS.0002
Name *	External user wants to view logged data
Version	1
Date	2010-11-12
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	An external user wants to check the status of the training progress, health data or monitoring data.
Priority	normal
Actors	External person (Doctor etc.) Florence Robot
Stakeholders	External person (Doctor etc.)
Basic course of action (path) *	1. The user connects to the robot via remote interface
Alternate courses of action (path) */2	
Preconditions *	Robot service is available, Robot connected to internet gateway
Triggers	User chooses application from the robot software
Postconditions *	Connection is established
Error conditions/Exceptions */2	No connection possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	Only few number of people have access to this data, not everyone that approaches the robot, the doctor should have access and maybe also someone from family

Element name	Check training data
Use Case ID *	LOGSYS.0003
Name *	Overview of training Data
Version	1
Date	2010-11-11
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The user wants to check the status of his training progress; the robot has logged the training and provides results.
Priority	normal
Actors	User Florence Robot
Stakeholders	User
Basic course of action (path) *	1. The robot checks database for available

Element name	Check training data
Use Case ID *	**LOGSYS.0003**
	training data 2. The data will be rendered to visualize training progress and is presented to the user
Alternate courses of action (path) */2	
Preconditions *	Some training data has to be logged before
Triggers	User chooses application from the robot software
Postconditions *	User closes application software
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Check long term status
Use Case ID *	**LOGSYS.0004**
Name *	Overview of long term Logs
Version	1
Date	2010-11-11
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The user wants to check the status of his overall health and training status, the robot provides long term trends of data changes
Priority	normal
Actors	User Florence Robot
Stakeholders	User
Basic course of action (path) *	1. The robot checks database for available data 2. The data will be rendered to visualize long term trends and progress and presents this to the user 3. The user can deduce e.g. the need of change in lifestyle
Alternate courses of action (path) */2	
Preconditions *	Some data has to be logged before
Triggers	User chooses application from the robot software
Postconditions *	User closes application software
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Check short term status
Use Case ID *	**LOGSYS.0005**

Element name	Check short term status
Use Case ID *	LOGSYS.0005
Name *	Overview of short term Logs
Version	1
Date	2010-11-11
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The user wants to check the status of his current health and training status, the robot provides short term monitoring results
Priority	normal
Actors	User Florence Robot
Stakeholders	User
Basic course of action (path) *	1. The robot checks database for available data 2. The data will be rendered to visualize short term monitoring results and presents this to the user 3. Warnings in case of sudden value changes can be given to the user
Alternate courses of action (path) */2	
Preconditions *	Some data has to be logged before
Triggers	User chooses application from the robot software
Postconditions *	User closes application software
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Request general Health Report
Use Case ID *	LOGSYS.0006
Name *	Request general Health Report
Version	1
Date	2010-11-11
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	Medical personnel wants to check the status of the overall health and training status without moving to the users home or get the user to the office.
Priority	normal
Actors	External user (Doctor etc.) Florence Robot
Stakeholders	External user (Doctor etc.)
Basic course of action (path) *	1. The robot checks if the person has permission to get requested data 2. The robot checks database for available data 3. The data will be rendered to visualize long term trends and progress and presents this to the

Element name	Request general Health Report
Use Case ID *	**LOGSYS.0006**
	user 4. In case of critical values, the elderly person can be ordered to visit a doctor or to reduce / increase training efforts
Alternate courses of action (path) */2	
Preconditions *	Some data has to be logged before
Triggers	User chooses application from the robot software
Postconditions *	User closes application software
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	INCLUDE LOGSYS.0002
Assumptions (Optional)	

Element name	Check Gait status
Use Case ID *	**LOGSYS.0007**
Name *	Check Gait status
Version	1
Date	2010-11-11
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	Medical personnel want to check the gait velocity status of the elderly to deduce the fall risk of the person.
Priority	normal
Actors	External user (Doctor etc.) Florence Robot
Stakeholders	External user (Doctor etc.)
Basic course of action (path) *	1. The robot checks if the person has permission to get requested data 2. The robot checks database for available data 3. The data will be rendered to visualize long and short term trends and presents this to the user 4. In case of critical values, a care giver could be send to the home to check for or remove dangerous obstacles to reduce the risk of falls
Alternate courses of action (path) */2	
Preconditions *	Some data has to be logged before, remote user needs valid user account
Triggers	User chooses application from the robot software (can also be from remote side)
Postconditions *	User closes application software
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	INCLUDE LOGSYS.0002

Element name	Check Gait status
Use Case ID *	LOGSYS.0007
Assumptions (Optional)	

Element name	Disconnect from Service
Use Case ID *	LOGSYS.0008
Name *	Disconnect from Service
Version	1
Date	2010-11-12
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	External user has checked desired data and closes the connection
Priority	normal
Actors	External user (Doctor etc.) Florence Robot
Stakeholders	External user (Doctor etc.)
Basic course of action (path) *	1. The user disconnects from the Robot
Alternate courses of action (path) */2	
Preconditions *	User was logged in
Triggers	User chooses option within the robot software
Postconditions *	Connection disconnected
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

In Table 23Table 6 a reflection on how to expand the LOGSYS scenario is included, as well as a very rough estimation of the foreseen technical modifications involved in it.

LOGSYS	Additional functionality for scenario expansion	Foreseen technical modification
This service is a generic service, no expansion foreseen.	No added functionality needed	-

Table 23. LOGSYS expansion table

6 SUMMARY

The defined scenario redefinition process was successfully executed and from the eight proposed scenarios in D1.1, 'Device Coaching' (DEVCOA) was removed due to low perceived interest in the focus group results and the high technical difficulty to successfully offer the service. For the other scenarios only small modifications were applied and most of them were found feasible.

Results from the WoOZ tests should be mainly taken into account in the technical modules developed in WP2, WP3 and WP4. Users indicated, both in focus groups and WoOZ tests, how they would like the robot to move and especially that they wanted to be in control of the robot's movement. Users, in general, did not embrace the idea of a robot moving autonomously. However for emergency services users agreed to give up control and partially, some of their privacy, in order to be assisted. The use cases have been checked to find out whether the WoOZ had a direct influence on them.

In the interaction aspects and sub-aspects tested, users were overall positive about the choices offered, with special interest in voice commands and touch screen capabilities.

Expansion for the services was considered and reflections on general technical difficulty were described. Almost all scenarios described offered possibilities for future expansion. LOGSYS was the only one found so generic already that no consideration for further expansion was mentioned.

7 CONCLUSIONS

The generation of use cases was run in parallel in WP5 (see D5.2) and therefore most of the use cases performed were feasible as many technical people were involved in their description. Considering that work from D1.3 will follow in WP5 service implementation, it is regarded as extremely positive the synchronization established among WP1 and WP5.

In general users and caregivers had a good understanding of the purpose of the different scenarios and interacted easily with the robot in the WoOz tests. From their comments it seems the scenarios are meaningful to the user and the need of a robot to provide the services is considered. In the WoOz test users showed no significant difficulties in the execution of the different proposed actions (see D1.4 for more information on results of WoOz tests).

Scenario functionality has not changed dramatically from D1.1, except DEVCOA that has been removed. However significant appreciations were included, such as full control for users except in emergency situations.

Extension of services is reasonable; possibilities for the services diversification would like to expose the versatility and plurality of the chosen scenarios.

The Florence partners are satisfied with the final use case and scenarios proposed in this deliverable and will continue working on them to turn them into Florence system services in WP5. This set of scenarios and use cases should help demonstrate the capabilities of the Florence system, as well as the potential of the different technical modules produced in WP2, WP3 and WP4.

8 REFERENCES

[1] "Usability Engineering, Scenario-based development of human-computer interaction" by Rosson & Carroll http://books.google.es/books?hl=es&lr=&id=RRC9IODz4VsC&oi=fnd&pg=PR7&dq=usability+engineering+scenario-based+development+of+human-computer+interaction&ots=599nZSFW3B&sig=SQ4MK7hGGOs6QPuOQ8pwG1tgaRI#v=onepage&q&f=false

[2] White paper "Functional requirements and Use Cases", by Malan and Bredemeyer, Bredemeyer Consulting (http://www.bredemeyer.com) http://www.bredemeyer.com/pdf_files/functreq.pdf

[3] "Use-cases. An Introduction" by Jason Gorman, 2006, Parlez uml (http://www.parlezuml.com/tutorials/usecases/usecases_intro.pdf) http://www.parlezuml.com

9 ANNEX A: Scenario and use case elaboration

In this section information on scenario and use case creation procedures as well as templates and examples can be found. This information was used as a guideline by all partners in scenario and use case elaboration.

9.1 Scenarios

9.1.1 Scenario definition and objective

Scenarios are descriptions of people using technology, allowing discussion of the system before it is built [1].

The basic argument behind scenario-based methods is that descriptions of people using technology are essential in discussing and analyzing how the technology is (or could be) reshaping their activities. A secondary advantage is that scenario descriptions can be created before a system is built and its impact is felt.

The emphasis on people's changing goals, plans and understandings is an important aspect that distinguishes user interaction scenarios from the related software engineering concept of use cases.

In Scenario-Based-Development (SBD) the output of any phase (definition of requirements, design, prototype and evaluation) includes user interaction scenarios ([1], see Table 24). In the Florence project, scenarios will be used in the first phase of the development, that is, as a **tool for analyzing and defining the requirements of the system**.

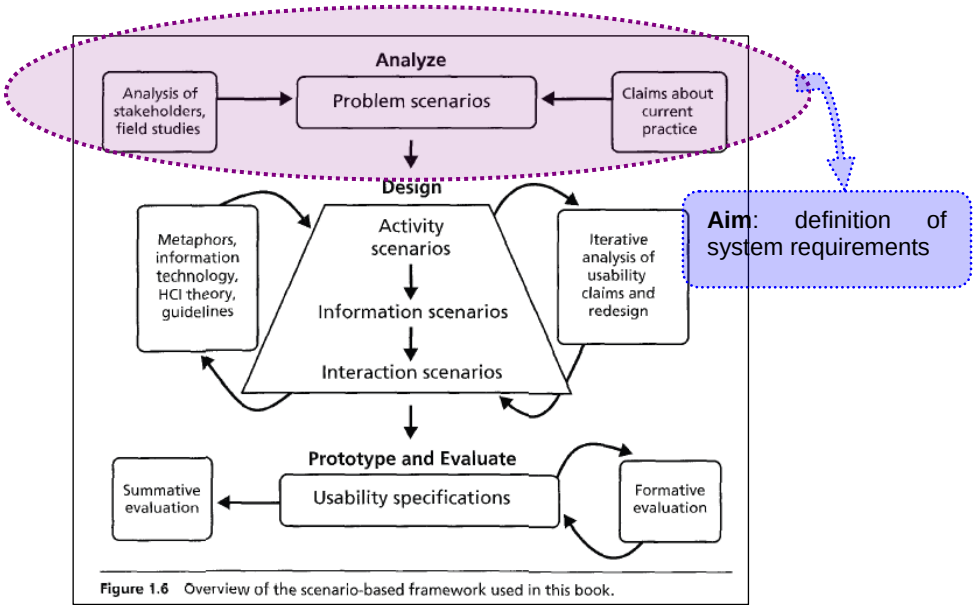

Table 24. Scenario based development

In **requirements analyses** (see [1], chapter 2, and Table 25), the problem situation is studied through interviews with clients and other users (the stakeholders), field studies of the current situation and brainstorming among users and developers. This input is used to formulate **problem scenarios** that convey important characteristics of the users, the typical and critical tasks they engage in, the tools they use and their organizational context.

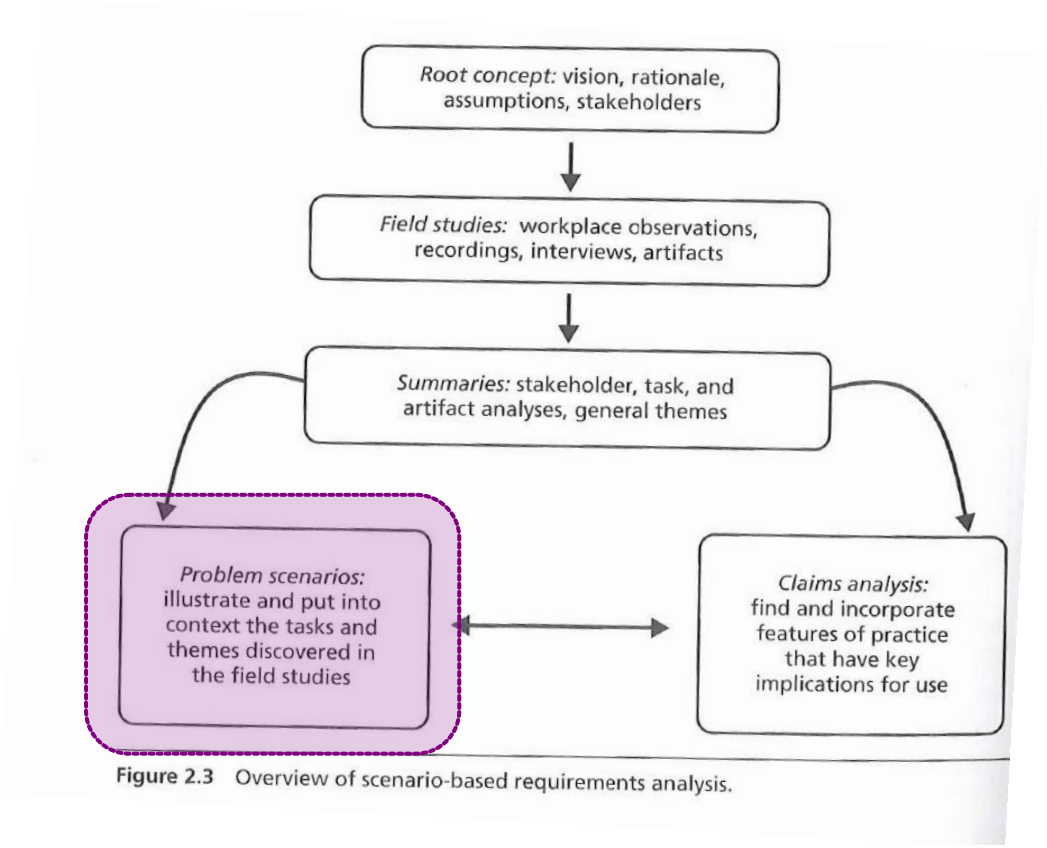

Figure 2.3 Overview of scenario-based requirements analysis.

Table 25. Scenario based requirements analysis

In SBD, the analysis and refinement of scenarios is stimulated by claims. Claims are statements that list important features of a situation and their impacts in user experiences. Claims are related to the general notion of tradeoffs in design, because they always analyse both positive and negative usability impacts.

9.1.2 Scenario template

The proposed scenario creation template in Florence contains a functional description and the scenario itself.

The **scenario creation procedure** suggested in Florence project contains two phases. The first phase encourages reflexive steps to understand the current practice. The second phase is where the scenario elements and the scenario of the foreseen future situation are described.

The first phase consists of the following steps:

1. Current short scenario: description of the current practice/situation, including the perceived need
2. Stakeholders short description in the current practice/situation
3. Task analysis in the current practice/situation
4. Artifacts' (devices, tools, etc.) short description in the current practice/situation

Reflexive elements	Definition	Examples
Current short scenario	Descriptive short current scenario including identified need. This need will be targeted in the future foreseen scenario.	Jose and his (little) grandson Carlos are making a puzzle together. They enjoy playing together, and this day they've decided to make a big puzzle that the grandson individually wouldn't be able to complete. Carlos starts with the puzzle, and Jose helps him with difficult parts. Carlos loves feeling his grandpa is there for helping him and cheering him up. When it's time to leave, Carlos' parents let him now it's time to pick up, Carlos complains because they still haven't finished with the puzzle. Jose is also sorry they can't spend more time together.
Stakeholders	Groups or individuals that should be consulted or observed in the fieldwork. The brief description of each group's interest points to questions or tasks that should be raised and observed	- Grandfather who enjoys spending time with his grandchildren. Very satisfied when he can share his background knowledge and experience with his grandson. Making puzzles is challenging for him, as he started with this entertainment together with his grandson. - Grandson aged around 10, loves puzzle and this type of "intellectual" games, although sometimes it is difficult for him to finish them and gets bored when difficulties arise - Parents: they bring the grandson to the grandfather's house every now and then
Task analysis	Brief list that documents the tasks of each stakeholder. It helps make sure all relevant tasks are considered.	- Grandfather: help selecting puzzle, help selecting working surface, help making some parts, make other difficult puzzle parts, encourage grandson while making puzzle - Grandson: select puzzle according to picture and quantity of pieces, select surface on which to make the puzzle, put reference image in a visible place, make puzzle - Parents: determine when and how long grandson and grandfather can be together
Artifacts	The description of the different devices, tools, etc. that are used. It will help in making interaction design choices as well as provide input in the task analysis.	- Puzzle - Puzzle cover (reference image) - Surface to make the puzzle on (table) - Chairs

Table 26. Items to be described in the first phase of the scenario generation

The second phase consists of the following items:

1. Analysis of the scenario characteristic elements (see table below)
2. Scenario description

The following table should be filled in. Information from this table will help build appropriate scenarios.

Scenario element	Definition	Examples
Setting	Situational details that motivate or explain goals, actions, and reactions of the actor(s): - What does the space have in it - What do people do in the space - Does the nature of the space change with different actors (i.e. wealthy/poor, active/sedentary)	Jose's home, dining room. Saturday afternoon, 16:00. Jose is reading the newspaper.
Actors	Human(s) interacting with the computer or other setting elements; personal characteristic relevant to scenario	- Jose, a 70 years old grandfather having a strong relationship with his grandson Carlos, who lives 25 Km. far from him.
Task goals and actions	Effects on the situation that motivate actions carried out by actor(s) Observable behaviour	Goals: - Have fun with his grandson - Collaborate to succeed in finishing a big puzzle, bigger than the one they would finish individually Actions: - Communicate with Carlos thanks to the videoconference system integrated in the Florence robot - Help Carlos putting correctly some difficult pieces of the puzzle - Make parts of the puzzle - Encourage Carlos to finish the puzzle
Plans	Mental activity directed at converting a goal into a behaviour	- Making the difficult parts will encourage Carlos to continue - If they don't finish this afternoon, Jose will continue with the puzzle the following day
Evaluation (optional)	Mental activity directed at interpreting features of the situation	
Events	External actions or reactions produced by the computer or other features of the setting; some of these may be hidden to the actor(s) but important to scenario	- Florence robot prompts him to take part on the interactive puzzle his grandson Carlos is making at home - Carlos is putting pieces together - Carlos asks grandpa to make that part of the sky that it is so difficult for him
Artifacts	Physical objects that populate the	- Florence robot

	scenario	

Table 27. Items to be described in the second phase of the scenario generation

This is the scenario's brief goal and functionality description:

The making puzzle service implemented in the Florence system provides family relatives the option of performing a collaborative ludic activity like puzzle making, remotely and synchronized, both players at the same time or asynchronized.

Jose and his 10 years old grandson Carlos have a strong relationship. They both like very much making puzzles. They both have grown closer sharing this activity.

It is Saturday afternoon and Jose is in his dining room reading the newspaper. The Florence robot is around. Suddenly, the robot system comes to Jose and prompts him to join remotely the puzzle making activity his grandson is carrying out at home by means of a tablet pc. Jose is very glad to accept.

Carlos has selected a big and difficult puzzle, as he is asking grandpa to collaborate to bring together the puzzle image. Jose starts helping with some difficult pieces, encouraging Carlos to first look carefully to the reference image on the cover of the puzzle-box and then to the pieces. It is really funny to play together remotely at the same time, the voice communication integrated in the robot makes things easier.

Carlos asks grandpa to bring together that part of the sky that it is so difficult for him. Pieces start moving magically. Carlos loves feeling that grandpa is with him, even if he isn't physically there.

As time goes by and they haven't finished, Jose promises Carlos to continue with the puzzle. He will try to finish by tomorrow.

To summarize the given template is the following:

[The aim of the described scenario A should be included here (1 paragraph).]

[The scenario A description may be included here (4 to 5 paragraphs)

9.2 Use cases

9.2.1 Use case definition and objective

Use cases are a widespread practice for capturing functional requirements [3].

A use case defines a goal-oriented set of interactions between external actors and the system under consideration.

Actors are parties outside the system that interact with the system (UML 1999, pp. 2.113- 2.123). An actor may be a class of users, roles users can play, or other systems.

A use case is initiated by a user with a particular goal in mind, and completes successfully when that goal is satisfied. It describes the sequence of interactions between actors and the system necessary to deliver the service that satisfies the goal. It also includes possible variants of this sequence, e.g., alternative sequences that may also satisfy the goal, as well as sequences that may lead to failure to complete the service because of exceptional behavior, error handling, etc.

The system is treated as a “black box”, and the interactions with system, including system responses, are as perceived from outside the system.

Thus, use cases capture who (actor) does what (interaction) with the system, for what purpose (goal), without dealing with system internals. A complete set of use cases specifies all the different ways to use the system, and therefore defines all behavior required of the system, bounding the scope of the system.

Use-case scenario

A scenario is an instance of a use case, and represents a single path through the use case. Thus, one may construct a scenario for the main flow through the use case, and other scenarios for each possible variation of flow through the use case (e.g., triggered by options, error conditions, security breaches, etc.).

An example (see [3]): When a cardholder tries to withdraw cash from an ATM , it doesn’t always necessarily turn out the same way. Sometimes he gets his money. Other times he might have insufficient funds. Or the ATM may be out of cash. These are all examples of use case scenarios. The outcome is different, depending on circumstances, but they all relate to the same functional goal that is, they re all triggered by the same need and all have the same starting point.

According to [3], a classic mistake made at this early stage of design is to go into technical detail and commit to a specific user interface design or implementation technology. This is almost always the wrong time to be making these kinds of low-level design decisions. We first need to understand what the business logic of the interactions are, so we can focus on satisfying the business goal of the use case.

Essential use cases are a great technique for describing interactions in a way that is independent of the technical implementation of the system. Instead of saying the user presses the enter button, we say the user confirms their choice, for example.

A good way to write essential use cases is to split the actions into columns, one for each actor and one for the system. Then we can see at a glance not only the order of events in a use case scenario, but also exactly who is doing what.

9.2.2 Use case template

The following provides an outline of a process for creating use cases:

- Identify all the different users of the system.
- Create a user profile for each category of user, including all the roles the users play that are relevant to the system.
- For each role, identify all the significant goals the users have that the system will support.
- Create a use case for each goal, following the use case template. Maintain the same level of abstraction throughout the use case. Steps in higher-level use cases may be treated as goals for lower level (i.e., more detailed), sub-use cases.
- Structure the use cases. Avoid over-structuring, as this can make the use cases harder to follow.
- Review and validate with users.

There is no standard template for documenting detailed use cases. In the following template proposed for the Florence project those items that are required, considered essential are highlighted with *****:

Element name	**Description**
Use Case ID *	**Identification convention (ID.0001)**
Name *	State a concise, results-oriented name for the use case. These reflect the tasks the user needs to be able to accomplish using the system. Include an action verb and a noun. Some examples: • *View part number information.* • *Manually mark hypertext source and establish link to target.* • *Place an order for a CD with the updated software version*.
Version	Letter indicating version number.
Date	Revision date.
Author(s)	Name(s) (Organisation, email address)
Change history [Optional]	
Due date	Implementation due date.
Event identifier(s)	See events' list
Description *	Goal to be achieved by the use case and sources for requirements
Priority	Implementation priority
Actors	Lists of actors involved in the use case. An actor is someone or something outside the system that either acts on the system – a primary actor – or is acted on by the system – a secondary actor. An actor may be a person, a device, another system or sub-system, or time
Stakeholders	A stakeholder is an individual or department that is affected by the outcome of the use case.
Basic course of action (path) *	At a minimum, each use case should convey a primary scenario, or typical course of events. The main basic course of events is often conveyed as a set of usually numbered steps. Example: *1. The system prompts the user to log on,* *2. The userenters his name and password*

Element name	Description
Use Case ID *	**Identification convention (ID.0001)**
	3. The system verifies the logon information *4. The system logs user on to system*
Alternate courses of action (path) */2	Use cases may contain secondary paths or alternative scenarios, which are variations on the main theme. Each tested rule may lead to an alternative path and when there are many rules the permutation of paths increases rapidly. Sometimes it is better to use conditional logic or activity diagrams to describe use case with many rules and conditions. Alternative paths make use of the numbering of the basic course of events to show at which point they differ from the basic scenario, and, if appropiate, where they rejoin
Preconditions *	All the conditions that must be true for the trigger (see below) to meaningfully cause the initiation of the use case. That is, if the system is not in the state described in the preconditions, the behavior of the use case is indeterminate.
Triggers	Event that causes the use case to be initiated. This event can be external, temporal or internal.
Postconditions *	Describes what the change in state of the system will be after the use case completes. Post-conditions are guaranteed to be true whe the use case ends.
Error conditions/Exceptions */2	What happens when things go wrong at the system level. It should indicate how the system will respond to, or (if possible) recover from, the error condition.
Status	Draft | Pending bug fix | Stable | Final
Frequency (Optional)	
Extended use case (Optional)	Use case modified to include the condition that is evaluated when the first extension point is reached. Sections: - Use case extension: <extension identifier> extends <use case identifier> - Change: goal to be achieved by extension - Condition: The condition that must be satisfied if the extension is to take place - Steps: changes to use case steps
Included use cases (Optional)	Included cases are full use cases in their own right, and therefore can be expressed using the use case template. Including a sub-use case in a step is expressed by the keyword INCLUDE.
Assumptions (Optional)	Conditions that must be true for use case to terminate successfully.

10 ANNEX B: Initial Use Cases

In this section the initial set of use cases for all the different scenarios can be found. This initial set was completed taken into account feedback from focus groups (for more info see section 3.2)

10.1 KEETOU: After focus groups feedback (Version A)

Element name	**Accept a call**
Use Case ID *	**KEETOU.0001**
Name *	Accepting a call
Version	1
Date	2010/11/14
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Dietwig Lowet (Philips, Dietwig.lowet@philips.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Sofia notices in the agenda of her mother, Carla, that she had received very little visits the last few days. Therefore, Sofia decides to pay her mom a "virtual" visit today. 2. Sofia initiates a call from her "device". 3. The Florence system gets the call. 4. The Florence robot approaches Carla who sits on the couch in her living room. 5. It lets her know she has a call for a virtual visit from Sofia. 6. It asks Carla for confirmation. 7. Carla accepts the call. 8. Sofia and Carla talk to each other.
Description *	Sofia sends an invitation to Carla to talk with her
Priority	
Actors	Sofia and Carla (the users)
Stakeholders	Sofia: she asks to Florence for starting the service Carla: she receives the Sofia's invitation
Basic course of action (path) *	1. Sofia goes to Florence to ask him to start the service
Alternate courses of action (path) */2	
Preconditions *	Florence is waiting
Triggers	Sofia ask to Florence for connecting with Carla
Postconditions *	Sofia and Carla are connected to talk
Error conditions/Exceptions */2	1. Florence cannot contact Carla: tell to Sofia that the connection cannot be done and close the service 2. Carla rejects Sofia's proposal: tell to Sofia that Carla rejected the proposal for playing
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	The connection was made successfully

Element name	**Initiate a call**
Use Case ID *	**KEETOU.0002**
Name *	Accepting a call
Version	1
Date	2010/11/14
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Dietwig Lowet (Philips, Dietwig.lowet@philips.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Carla calls the Florence system. 2. The Florence robot approaches Carla. 3. Carla asks it to call Marcus. 4. The Florence system tries to reach Marcus by first calling him at his work. 5. Marcus accepts the call on his “device”. 6. Carla and Marcus talk to each other.
Description *	Carla initiates a call to her son Marcus.
Priority	
Actors	Carla and Marcus (the users)
Stakeholders	Carla: she asks to Florence for starting the service Marcus: she receives the Sofia’s invitation
Basic course of action (path) *	1. Carla sits on a couch in her living room 2. Carla feels lonely 3. Carla decides to contact her son Marcus.
Alternate courses of action (path) */2	1. Marcus is not at work, so the Florence system tries to reach Marcus at his home.
Preconditions *	Florence is waiting
Triggers	Carla ask to Florence for connecting with Marcus
Postconditions *	Carla and Marcus are connected to talk
Error conditions/Exceptions */2	1. Florence cannot contact Marcus anywhere: tell to Carla that the connection cannot be established and close the service 2. Marcus rejects Carla’s invitation: tell to Carla that Marcus rejected the invitation for a telepresence session.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	The connection was made successfully

Element name	**Control by remote**
Use Case ID *	**KEETOU.0003**
Name *	Control by remote
Version	1
Date	2010/11/14
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Dietwig Lowet (Philips, Dietwig.lowet@philips.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Carla stands up from the couch and moves towards the curtains. 2. The Florence robot follows her, remotely controlled by Sofia from her “device”. 3. During the talk, close to the curtains, Sofia

Element name	Control by remote
Use Case ID *	**KEETOU.0003**
	remotely controls the Florence robot to alternate between having a better look at the curtains and seeing Carla's face (to follow the conversation). 4. After finishing the talk, Carla moves towards the couch. 5. The Florence robot follows her, remotely controlled by Sofia from her "device". 6. Carla sits down on the couch.
Description *	Several days ago, new curtains were installed in Carla's living room. During the virtual visit from Sofia, Carla decides to show Sofia the new curtains.
Priority	
Actors	Sofia (the users)
Stakeholders	Sofia: moves Florence by a remote control
Basic course of action (path) *	1. Sofia controls the robot remotely using either a keyboard or a gaming-type like controller 2. If Sofia makes a mistake and the robot is to hit some obstacle. The robot will detect this and avoid the obstacle. The robot will also send a warning signal to Sofia to let her know that she was about to hit an obstacle. This could be implemented for example by a rumbling in the controller.
Alternate courses of action (path) */2	
Preconditions *	Carla and Sofia are already connected
Triggers	
Postconditions *	Sofia and Carla are connected to talk
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	KEETOU.0001 – Accept a call
Assumptions (Optional)	

Element name	Share photos
Use Case ID *	**KEETOU.0004**
Name *	Sharing photos
Version	1
Date	2010/11/14
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Dietwig Lowet (Philips, Dietwig.lowet@philips.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. While Carla is watching TV, Carla's grandson sends her two pictures from his social networking site. 2. The Florence system receives the pictures. 3. When the Florence system recognizes that Carla stopped watching TV, it offers her to see the pictures. 4. Carla accepts. 5. The Florence system shows the new pictures. 6. Carla sees the photos
Description *	When the Florence robot receives new pictures the

Element name	Share photos
Use Case ID *	**KEETOU.0004**
	elderly will be triggered that new pictures are available. A good moment for triggering must be found: the elderly can be busy, having visitors, watching TV, etc and does not always want to be bothered with having to view new pictures. Therefore the Florence system has to determine the appropriate time for showing the elderly the new pictures. At a certain time on the day the robot starts to check if the elderly is ready for watching the pictures (only when new pictures have arrived). The robot can check if the elderly is ready to view the new pictures by trying to determine if the elderly is occupied. The Florence robot can determine that the elderly is watching television and conclude that he/she does not want to be bothered right now. When the Florence robot has determined that now would be an appropriate time to display the pictures it will approach the elderly and asks if he/she would like to view the new pictures. The robot will display a thumbnail view of all the new pictures and the elderly can select which one to view. For each picture the elderly can send feedback to the person that has sent the picture. This feedback can be in the form selecting a number of phrases from a list by touch or by voice.
Priority	
Actors	Carla and Carla's grandson (the users)
Stakeholders	Carla's grandson: send the photos Carla: sees the photos
Basic course of action (path) *	
Alternate courses of action (path) */2	After see the photos, Carla likes one picture very much and lets her grandson know about this
Preconditions *	Carla has been watching TV all the afternoon
Triggers	
Postconditions *	Carla sees the photos
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	KEETOU.0001 – Accept a call
Assumptions (Optional)	Carla accepts the photos and sees them

10.2 HOMINT: After focus groups feedback (Version A)

The use case diagram in Table 28 displays the use cases of the Advanced Home Interface Scenario. In the following sub sections a subset of these use cases is described in a tabular form.

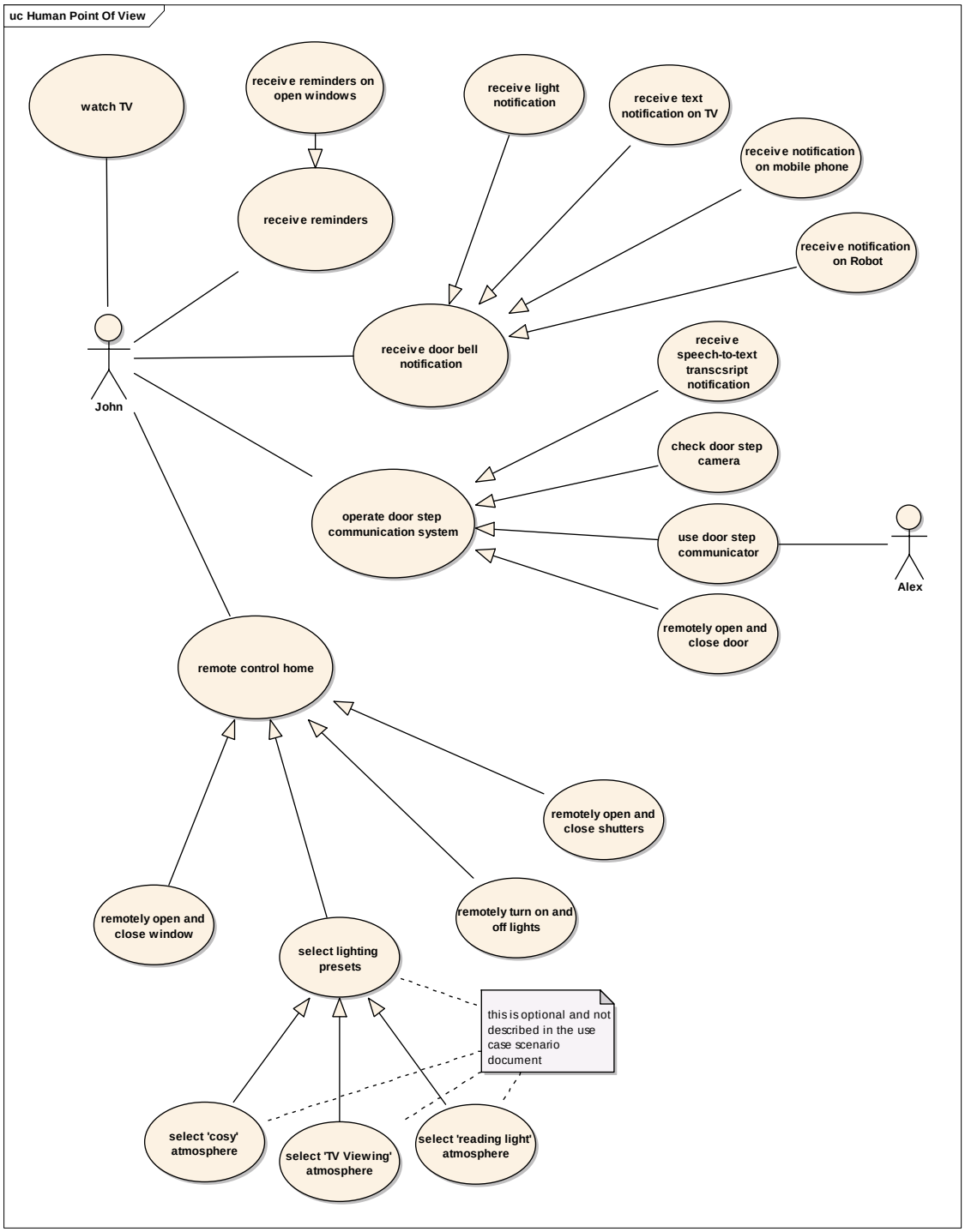

Table 28. HOMINT use case diagram

Element name	**Receiving reminders**
Use Case ID *	**HOMINT.0001**
Name *	Receiving reminders about open windows, left-on oven, etc.
Version	1.0
Date	2010
Author(s)	Florian Winkler, NEC, Winkler@neclab.eu

Element name	**Receiving reminders**
Use Case ID *	**HOMINT.0001**
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The system detects if windows are left open or a stove or light is left turned on and reminds the elderly to close them or turn them off. The reminders are linked to the home automation system to remotely close windows or turn off lights.
Priority	Normal
Actors	John (primary) Alex (secondary)
Stakeholders	User, Florence Home System
Basic course of action (path) *	1. The user is reminded to open the window to refresh the air in the room 2. The user remotely opens the window and an automatic timer within the system is activated to remind the user after 15 minutes to close the window again 3. The elderly person forgets to close the open window 4. After 15 minutes the system initiates an automatic reminder informing the user about the open window and with a recommendation to close it again. 5. The Notification is displayed on the user interface currently in use by the elderly (this could be the TV, the mobile phone or the robot)
Alternate courses of action (path) */2	None
Preconditions *	The window / stove must have been turned on. The user must not have turned off the devices, otherwise no reminder will be triggered / necessary.
Triggers	Timeout of a reminder timer.
Postconditions *	If the window was closed / stove turned off by the user, reminder timers are deactivated. If they were not turned off, the reminder timer is reset and more reminders will be triggered periodically.
Error conditions/Exceptions */2	None
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	**Receiving Door Bell Notification**
Use Case ID *	**HOMINT.0002**
Name *	Receiving notifications from the door bell / intercom system. This includes the following sub use cases: • Receiving notifications via room lights (in case the person is deaf) • Receiving textual/audible notifications on the TV screen • Receiving textual/audible notifications on the mobile phone • Receiving textual/audible notifications on the mobile robot

Element name	Receiving Door Bell Notification
Use Case ID *	**HOMINT.0002**
Version	1.0
Date	2010
Author(s)	Florian Winkler, NEC, Winkler@neclab.eu
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	To allow the elderly to notice when visitors are ringing the door bell even if the elderly are deaf or blind, this use case describes ways to notify the elderly of door bell events.
Priority	Normal
Actors	John (primary) Alex (secondary)
Stakeholders	User, Florence Home System
Basic course of action (path) *	Alex, a friend of John, the elderly person is visiting. John is hearing impaired. 1. Alex rings the door bell. 2. The Florence Home Interface detects the door bell being rung. 3. The Florence Home Interface generates a door bell notification to be dispatched to John. 4. The Florence Home Interface queries the Florence system for the current user interface that John should be notified on. 5. Since John is watching TV, the Florence Home Interface dispatches the notification to the TV where it is displayed as a pop up. 6. Additionally, the room lights or a dedicated lamp start to flicker in a pattern that indicates to John that the door bell was rung.
Alternate courses of action (path) */2	None
Preconditions *	The door bell has to be connected to the Florence Home Interface as well as all possible interfaces that the elderly person might want to receive a door bell notification on. If the room lights are used to indicate a door bell ring, the elderly should be familiarized with the flicker pattern.
Triggers	Door bell being rung
Postconditions *	None
Error conditions/Exceptions */2	None
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Operate Doorstep Communication System
Use Case ID *	**HOMINT.0003**
Name *	Remote control of doorstep communication system / intercom. This includes the following sub use cases: • Check door step camera • Receive speech-to-text transcripts of voice recording from visitors at door step • Remotely lock / unlock doors • Remotely communicate with visitors at door step via TV, mobile or robot
Version	1.0
Date	2010
Author(s)	Florian Winkler, NEC, Winkler@neclab.eu
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	Give elderly users with hearing / seeing problems remote access to and control over doors and intercom from home devices like TV, mobile phone, mobile robot.
Priority	Normal
Actors	John (primary) Alex (secondary)
Stakeholders	User, Florence Home System
Basic course of action (path) *	1. Alex comes to visit John 2. Alex rings the door bell 3. John is notified of this on his TV, mobile phone or robot 4. John accesses the intercom from his TV, mobile phone or robot 5. John can see Alex via the live video feed from the door step camera on his TV, mobile phone or robot 6. He can communicate with Alex at the door step via the intercom system 7. Since John has hearing problems, the Florence Home System performs speech recognition that transcribes the words spoken by Alex in written text. This text is shown on John's TV, mobile phone or robot 8. John asks Alex in and remotely opens the lock of the front door
Alternate courses of action (path) */2	None
Preconditions *	John must have been informed about the door bell being run which is described in use case HOMINT.0002
Triggers	Door bell being rung
Postconditions *	None
Error conditions/Exceptions */2	None
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Remote Control Home
Use Case ID *	**HOMINT.0004**
Name *	Remotely control home appliances from TV, mobile phone or mobile robot.
Version	1.0
Date	2010
Author(s)	Florian Winkler, NEC, Winkler@neclab.eu
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	Assist the elderly in keeping control over their home by allowing them to open/close windows, lock and unlock doors, control lights, heating and air conditioning systems and provide a safer home environment by smart metering solutions that detect turned on heat sources like ovens. This includes use cases like: • Open/close shutters • Open/close windows • Set preset light levels for different atmospheres • Turn on/off lights
Priority	Normal
Actors	John (primary)
Stakeholders	User, Florence Home System
Basic course of action (path) *	1. John is reminded to refresh the air by opening a window. 2. John accesses the remote home control menu of the Florence Home System. 3. He gets an overview of all windows in his house together with the state they are in (open/closed). 4. He selects a window either on his TV with the remote control, or on his robot or mobile phone with the touch screen. 5. The Florence home system automatically opens the window and set a timer to remind John to close it later. 6. John decides that he wants to have a more cosy atmosphere to read his book. 7. He selects a preset “Reading Light” light setting 8. The Florence Home System turns down the main room lights, and fades on the reading lights in the room. 9. John can access the lighting menu of the Florence Home System, where he can select which lights he wants to turn on or off.
Alternate courses of action (path) */2	None
Preconditions *	None
Triggers	User interaction with home remote control system
Postconditions *	Depending on the actions of the user (e.g. if he opened a window) timers might be set that will trigger reminders in the future (e.g. to close the window)
Error conditions/Exceptions */2	None
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

10.3 FALHAN: After focus groups feedback (Version A)

The use case diagram shows the use case for the FALHAN scenario. This scenario is a simple use case because it only consists of two actions: recognizing the fall (in our case through emergency button) and establishing telepresence session with telecare center.

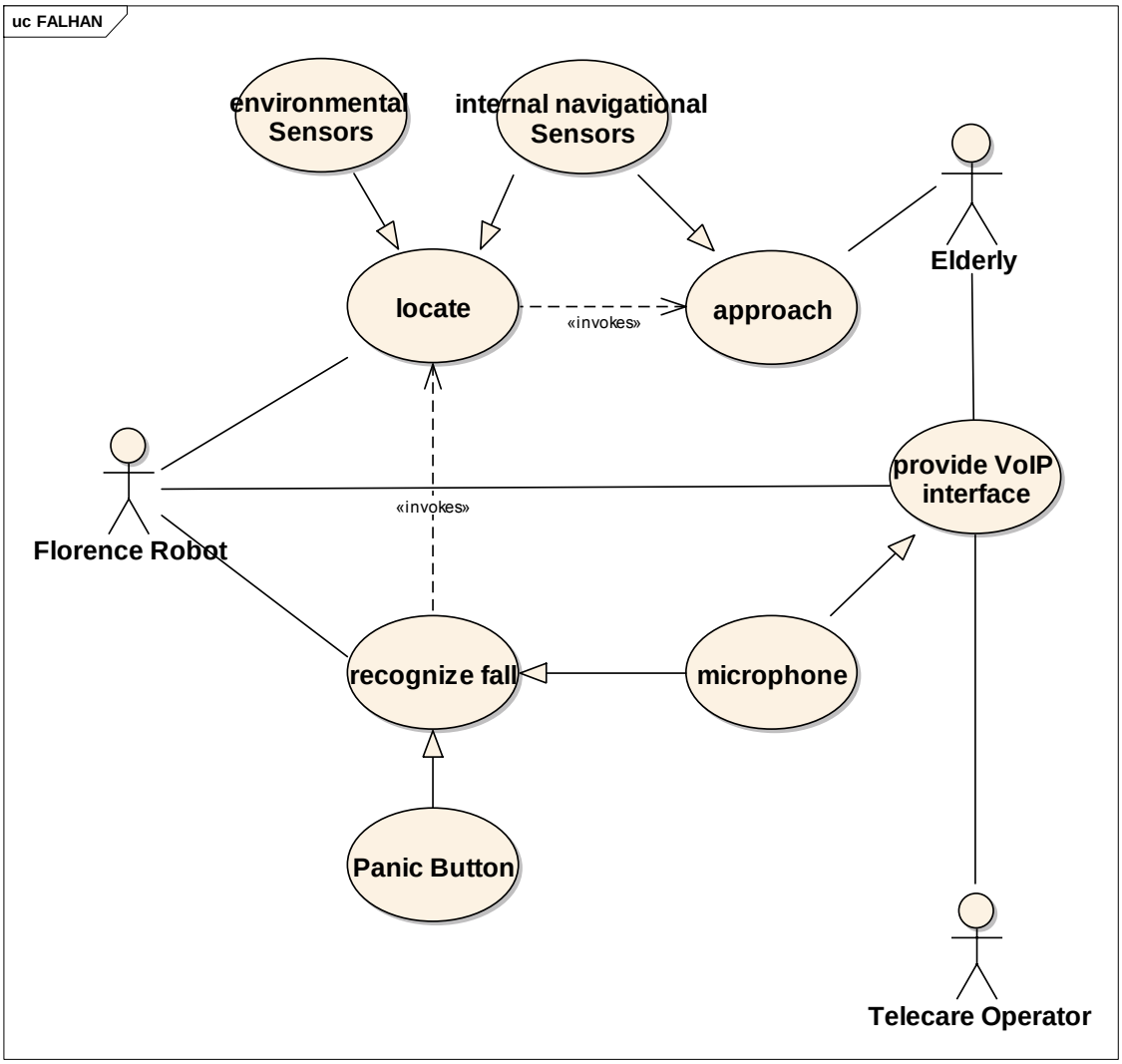

Table 29. FALHAN use case diagram

Element name	**Locate**
Use Case ID *	**FALHAN.0001**
Name *	• Locate User
Version	1.0
Date	10th of January 2011
Author(s)	Melvin Isken (OFFIS)
Change history [Optional]	
Due date	
Event identifier(s)	Robot locates user
Description *	The robot wants to get in contact with the userand

Element name	Locate
Use Case ID *	**FALHAN.0001**
	needs to locate him to do this.
Priority	
Actors	User Robot
Stakeholders	User Robot
Basic course of action (path) *	*1. The system software asks for locating the user* *2. The robot checks the environmental and internal sensors to locate the user* *3. The position of the user is provided to the software*
Alternate courses of action (path) */2	In the case that the robot fails to locate the user, an error message could be sent to the telecare centre
Preconditions *	- The user normally inhabits in accessible places for the robot.
Triggers	Fall
Postconditions *	
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	Every Fall
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	The user has to be accessible

Element name	Approach
Use Case ID *	**FALHAN.0002**
Name *	• Approach User
Version	1.0
Date	10th of January 2011
Author(s)	Melvin Isken (OFFIS)
Change history [Optional]	
Due date	
Event identifier(s)	1. Robot approaches user
Description *	In order to establish a successful telepresence call (and judgement by the teleoperator), the robot needs to approach the user
Priority	
Actors	User Robot
Stakeholders	User Robot
Basic course of action (path) *	*1. The system software instructs the robot to drive to the desired place*
Alternate courses of action (path) */2	In the case that the robot fails to approach the user, an error message could be sent to the telecare centre
Preconditions *	- The user normally inhabits in accessible places for the robot. - The robot has located the user
Triggers	Fall
Postconditions *	
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	Every Fall
Extended use case (Optional)	
Included use cases (Optional)	

Element name	Approach
Use Case ID *	**FALHAN.0002**
Assumptions (Optional)	The user has to be accessible

Element name	Provide VoIP interface
Use Case ID *	**FALHAN.0003**
Name *	• Provide VoIP interface
Version	1.0
Date	10th of January 2011
Author(s)	Melvin Isken (OFFIS)
Change history [Optional]	
Due date	
Event identifier(s)	1. The robot has located and approached the user. 2. The robot establishes a VoIP call between telecare centre and the user (robot).
Description *	The robot calls the telecare centre and enables the teleoperator to check and talk to the elderly
Priority	
Actors	User Robot Telecare operator
Stakeholders	User Robot Telecare operator
Basic course of action (path) *	1. *The system software calls the telecare centre* 2. *The teleoperator checks the situation and tries to get in contact with the elderly* 3. *The teleoperator decides which steps to take next*
Alternate courses of action (path) */2	In the case that the robot fails to connect to the telecare centre, it can try to contact a relative of the elderly
Preconditions *	- The user normally inhabits in accessible places for the robot. - The robot has approached the user
Triggers	Fall
Postconditions *	
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	Every Fall
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	The user has to be accessible

Element name	Recognize Fall
Use Case ID *	**FALHAN.0004**
Name *	• Recognize fall
Version	1.0
Date	10th of January 2011
Author(s)	Melvin Isken (OFFIS)
Change history [Optional]	
Due date	
Event identifier(s)	1. The robot gets a message from the panic button or the user that a fall has happened
Description *	Fall recognized
Priority	

Element name	**Recognize Fall**
Use Case ID *	**FALHAN.0004**
Actors	Sensors Robot
Stakeholders	Robot
Basic course of action (path) *	1. *The user presses the panic button or calls the robot for help* 2. *The robot recognizes the fall and executes the fall situation handling process*
Alternate courses of action (path) */2	
Preconditions *	- The user normally inhabits in accessible places for the robot. - The panic button is working
Triggers	Fall
Postconditions *	
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	Every Fall
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

10.4 AGREM: After focus groups feedback (Version A)

Element Name	Check the daily agenda
Use Case ID	AGEREM.0001
Name	Check the daily agenda
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: Santiago wants to know his agenda for the day. A. Santiago is at home: 1. Santiago opens the agenda menu of the robot application 2. The Florence System sends the agenda information to the robot application B. Santiago is not at home: 1. Santiago opens the FLORENCE application on his mobile phone 2. Santiago selects the agenda option of the FLORENCE application 3. The Florence System sends the agenda information to the mobile phone application

Element Name	Get Task Reminder
Use Case ID	AGEREM.0002
Name	Get Task Reminder
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: A task is due soon and the FLORENCE system reminds the user about it. 1. The FLORENCE system detects that a task is due soon 2. The FLORENCE system checks if Santiago is at home 3. The FLORENCE system sends a reminder to Santiago a. If Santiago is at home, FLORENCE sends a reminder via the FLORENCE robot b. If Santiago is not at home, FLORENCE sends a reminder via the mobile phone

Element Name	Get Task Information
Use Case ID	AGEREM.0003
Name	Get Task Information
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: Santiago wants to know more detail about a given task A. Santiago is at home: 1. Santiago asks the robot to get near him 2. Santiago goes to the Agenda in the FLORENCE robot menu 3. Santiago selects a particular tasks 4. Santiago selects the More information option of the FLORENCE robot application 5. The Florence system sends the information to the robot application B. Santiago is not at home: 1. Santiago opens the FLORENCE application on his mobile phone 2. Santiago selects the agenda option of the FLORENCE mobile application 3. Santiago selects a particular tasks 4. Santiago selects the More information option of the FLORENCE mobile application 5. The Florence system sends the information to the mobile application

Element Name	Set Task As Accomplished
Use Case ID	AGEREM.0004
Name	Set Task As Accomplished
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: Santiago has performed a task and wants the system to know this: A. Santiago is at home: 1. Santiago asks the robot to get near him 2. Santiago goes to the Agenda in the FLORENCE robot menu 3. Santiago selects a particular tasks 4. Santiago selects the mark as accomplished option of the FLORENCE robot application 5. The FLORENCE system updated the information regarding this task B. Santiago is not at home: 1. Santiago opens the FLORENCE

	application on his mobile phone 2. Santiago selects the agenda option of the FLORENCE mobile application 3. Santiago selects a particular tasks 4. Santiago selects the mark as accomplished option of the FLORENCE mobile application 5. The Florence system updates the information regarding this task

Element Name	Set Task For User
Use Case ID	AGEREM.0005
Name	Set Task For User
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: The Tele-assistance Unit Centre (TUC) wants to schedule a new task for the user 1. The TUC professional selects a particular user from his list 2. The TUC professional selects the Manage Agenda Option 3. The TUC professional a. Selects the create new task option and assigns a new task to the user b. Selects a task from the list and chooses the modify option 4. The Tele-assistance Unit Centre professional inputs the new data (description, schedule, due date…) 5. The task information is updated on the FLORENCE system

Element Name	Manage Tasks for a Given User
Use Case ID	AGEREM.0006
Name	Manage Tasks for a Given User
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: The TUC wants to review/modify the tasks for a particular user. 1. The TUC professional selects a particular user from his list 2. The TUC professional selects the Manage Agenda Option 3. The TUC professional navigates between the tasks

	for the user, setting new ones or modifying already existing ones, or just checking which the new appointments are.

Element Name	Manage Not Accomplished Task
Use Case ID	AGEREM.0007
Name	Manage Not Accomplished Task
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: A task has not been accomplished by the user 1. The FLORENCE System detects that a task has not been accomplished on time. 2. The FLORENCE System raises an alarm indicating that the task has not been accomplished 3. The TUC professional receives the alarm on his system 4. The TUC professional tries to perform a telecommunication with Santiago 5. The TUC professional decides whether to call the emergency service or not

Element Name	Perform Telecommunication
Use Case ID	AGEREM.0008
Name	Perform Telecommunication
Version	1
Date	2011/01/04
Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: The TUC wants to check why a task has not been carried out 1. The TUC selects the establish communication option from his/her system 2. The FLORENCE system detects if the user is at home or not and selects the best communication mechanism 3. The FLORENCE system starts a telecommunication between the TUC and Santiago 4. The TUC describes to the FLORENCE system what has happened and the decision that has been taken.

Element Name	Call Emergency Service
Use Case ID	AGEREM.0009
Name	Call Emergency Service
Version	1
Date	2011/01/04

Author	Karol (e.euprojectshealth@tid.es)
Change history	
Due date	
Event identifier	
Descriptor	Context: There's an emergency associated with a not performed task 1. The TUC has not been able to contact Santiago and decides to call the emergency service 2. The TUC uses the FLORENCE system to call the emergency service 3. The TUC retrieves the relevant data regarding Santiago from the FLORENCE system (e.g, address, important medical data,…) 4. The TUC delivers the relevant data to the emergency service 5. The FLORENCE system logs that an emergency situation has been attended

10.5 LIFIMP: After focus groups feedback (Version A)

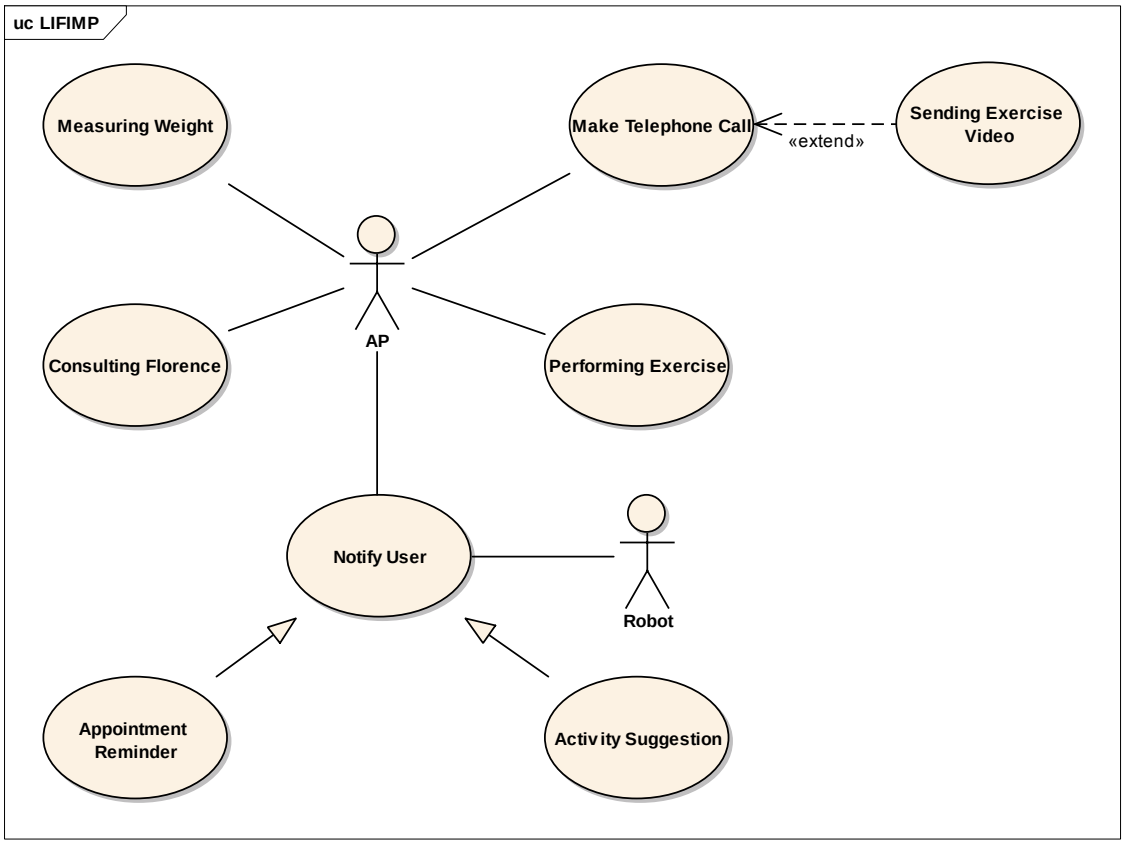

Table 30. LIFIMP use case diagram

AP stands for assisted person

Element name	**Measuring weight**
Use Case ID *	**LIFIMP.0001**
Name *	Measuring weight
Version	1
Date	2010-11-26
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The AP (Assisted Person) stands on his weighing scale, the measured weight is automatically added to his health status log.
Priority	normal
Actors	Elderly person Weighing scale
Stakeholders	Elderly person
Basic course of action (path) *	1. The AP enters his bathroom and stands on his weighing scale 2. The AP is identified 3. AP's weight is being added to his health status log
Alternate courses of action (path)	1. The AP enters his bathroom and stands on his

Element name	Measuring weight
Use Case ID *	**LIFIMP.0001**
***/2**	weighing scale 2. The AP could not be identified 3. Measurement is being stored for an 'unknown user' 4. The robot asks the AP who 'unknown user' is upon first encounter.
Preconditions *	Weighing scale needs to be connected to the Florence system. User needs to be identifiable preferable by his weight/BFP.
Triggers	AP takes place on his weighing scale
Postconditions *	AP's weight is added to his health status log.
Error conditions/Exceptions */2	AP could not be identified by the weighing scale.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Consulting Florence
Use Case ID *	**LIFIMP.0002**
Name *	Consulting Florence
Version	1
Date	2010-11-26
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The AP consults the robot for a recommended activity to do in the morning.
Priority	Normal
Actors	Assisted Person Robot
Stakeholders	Assisted Person
Basic course of action (path) *	1. The AP enters his kitchen or living. 2. The AP approaches the robot or asks the robot to approach him. 3. The AP asks the robot to provide him a recommended activity for this morning. 4. The AP gives immediate feedback on the recommendation.
Alternate courses of action (path) */2	
Preconditions *	Enough context needs to be available to come with a proper recommendation.
Triggers	AP aks the robot to come with a recommendation.
Postconditions *	Robot has given the AP a recommended activity.
Error conditions/Exceptions */2	Not enough context available to come with a good suggestion.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

Element name	**Notify User**
Use Case ID *	**LIFIMP.0003**
Name *	Notify User
Version	1
Date	2010-11-29
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The robot notifies the AP for either an agenda reminder or to suggest an activity.
Priority	Normal
Actors	Assisted Person Robot
Stakeholders	Assisted Person
Basic course of action (path) *	1. The robot detects the AP being in the same room as him. 2. The robot notifies the AP either visual or audible (whichever is most suited). 3. The AP approaches the robot and confirms he wants to see the notification, either by touch, gesture or voice. 4. The robot shows the reminder or activity suggestion.
Alternate courses of action (path) */2	
Preconditions *	Robot and AP need to be in the same room and either an agenda reminder or activity suggestion needs to be available.
Triggers	Robot detects the user being in the same room.
Postconditions *	Robot has shown the AP a recommended activity or agenda reminder.
Error conditions/Exceptions */2	Robot can't detect the AP.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

Element name	**Make Telephone Call**
Use Case ID *	**LIFIMP.0004**
Name *	Make telephone call
Version	1
Date	2010-11-29
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The AP uses the robot for his weekly telephone call with his physiotherapist.
Priority	Normal
Actors	Assisted Person Robot Physiotherapist
Stakeholders	Assisted Person

Element name	**Make Telephone Call**
Use Case ID *	**LIFIMP.0004**
	Physiotherapist
Basic course of action (path) *	1. AP takes place in his chair and orders the robot to approach im. 2. The robot approaches the AP. 3. The robot initiates the video call between the AP and physiotherapist. 4. Either the AP or the physiotherapist terminates the session as soon as they're done talking.
Alternate courses of action (path) */2	
Preconditions *	AP has taken place in his chair.
Triggers	AP asks the robot to approach him.
Postconditions *	Video call between the AP and physiotherapist has taken place.
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

Element name	**Sending Exercise Video**
Use Case ID *	**LIFIMP.0005**
Name *	Sending Exercise Video
Version	1
Date	2010-11-29
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	During the video call the physiotherapist sends an exercise to the AP.
Priority	Normal
Actors	Assisted Person Robot Physiotherapist
Stakeholders	Assisted Person Physiotherapist
Basic course of action (path) *	1. During the video call the AP and his physiotherapist discuss the AP's stiff hip. 2. The physiotherapist sends the AP a video and some accompanying instructions. 3. The video and instructions are stored so the robot can show them at a later time.
Alternate courses of action (path) */2	
Preconditions *	AP and his physiotherapist are having a video call.
Triggers	Physiotherapist sends an exercise video.
Postconditions *	Exercise video and accompanying instructions have been stored for later retrieval.
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	

Element name	Sending Exercise Video
Use Case ID *	**LIFIMP.0005**
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Performing Exercises
Use Case ID *	**LIFIMP.0006**
Name *	Performing Exercises
Version	1
Date	2010-11-29
Author(s)	Dirk-Jan van Dijk, Dirk-Jan.vanDijk@novay.nl
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The AP is performing an exercise, given to him by his physiotherapist, with the support of the robot.
Priority	Normal
Actors	Assisted Person Robot
Stakeholders	Assisted Person
Basic course of action (path) *	1. The AP moves the robot to a spot where the robot can show the video to the AP and the AP has enough space to move around and perform the exercise. 2. The robot starts playback of the video. 3. The AP performs the exercise
Alternate courses of action (path) */2	
Preconditions *	An exercise video is available..
Triggers	The AP either asks the robot for an exercise or the robot has suggested the AP to perform an exercise.
Postconditions *	AP has performed the exercise.
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	-
Included use cases (Optional)	
Assumptions (Optional)	

10.6 DEVCOA: After focus groups feedback (Version A)

Users in the focus groups indicated they deemed this scenario much less relevant than other scenario's. Moreover, users would rather consult other sources of information such asking kids, neighbours. This would mean that if the scenario is to be attractive, the service provided by Florence has to be extremely usable and satisfactory.

10.7 COLGAM: After focus groups feedback (Version A)

The following items from focus group feedback helped in reshaping the COLGAM scenario to the needs and preferences of the elderly people and professional caregivers:

- Provide an open collaborative activity framework and do not limit it to puzzle making.

- In case of doubt whether or not to provide a view of the remote user for communication purposes, always provide it.
- Offer both static and mobile robot remote user perception when engaged in the activity. In other words, give the user the choice of a moving robot activity partner or static robot activity partner.
- Domino, cards, gardening and knitting are among the top activities mentioned by elderly. Domino and cards are competitive activities and the focus of the scenario is to support collaboration. However, taking into account users would like to have the choice of different activities, at least 3 different choices will be provided for demo purposes.
- The users don't want that the system to detect when they are feeling lonely nor do they want to let the system know how they are feeling. The Florence system will therefore not monitor their mood in order to propose collaborative activities. The Florence system will only periodically propose to engage into collaborative activities based on inactivity and especially at the beginning, to introduce the activity to the users.
- Professionals suggested high dynamism for this scenario to be successful. On top of using gestures based pointing communication for intuitive interaction, the 'Suggest New Event' use case was included.

The overall Florence system will from now on be referred as Florence within the COLGAM uses cases, except when a specific component is considered (like the Florence robot).

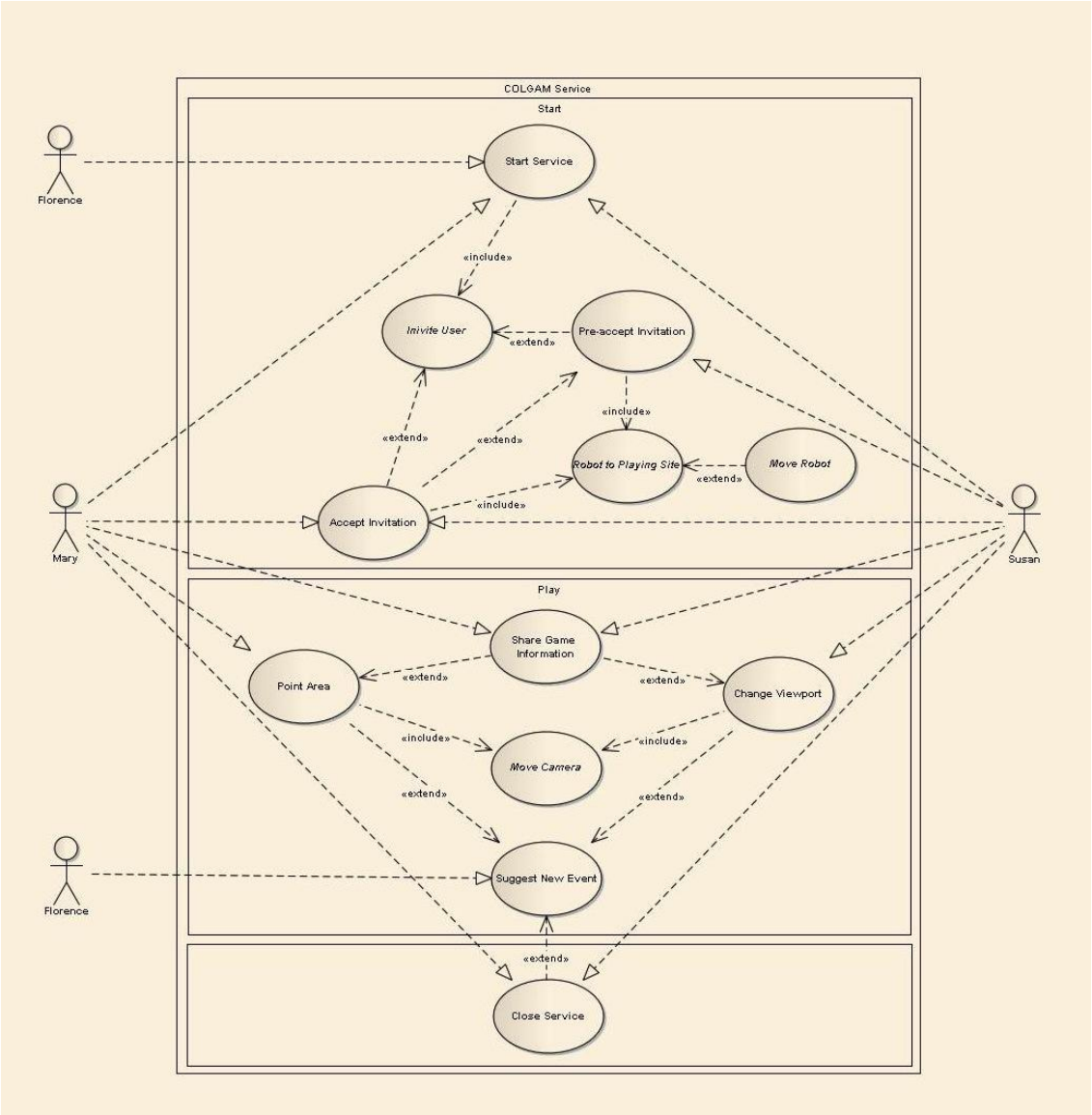

Table 31. COLGAM use case diagram

Element name	**Start service**
Use Case ID *	**COLGAM.0001**
Name *	Ask to take part in a collaborative activity
Version	2
Date	2010/12/02
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia leire.martinez@tecnalia.com)
Change history [Optional]	1. Mary asks to play with Susan 2. Mary asks to play with anyone associated with/linked to her
Due date	
Event identifier(s)	1. Mary informs Florence that she wants to start a collaborative activity. 2. Florence asks Mary which activity she wants to join. 3. Mary asks Florence for a puzzle 4. Florence asks Mary who she wants to play with

Element name	Start service
Use Case ID *	**COLGAM.0001**
	5. Mary asks Florence to play with Susan 6. Florence contacts Susan 7. Susan receives Mary's invitation (PC, phone) 8. Accept invitation (COLGAM.0003) or pre-accept the invitation (COLGAM.0002) use cases will be executed.
Description *	Florence system helps Mary to get in touch with Susan to start a collaborative gaming
Priority	1
Actors	Mary and Susan (the users) Florence
Stakeholders	Mary: asks Florence to start the service Susan: she receives Mary's invitation
Basic course of action (path) *	1. Mary requests to start a collaborative activity with Susan
Alternate courses of action (path) */2	1. Susan requests Florence website to ask Mary if she would like to start a collaborative activity. Florence gets in contact with Mary and proposes her the activity. Mary accepts Susan's invitation 2. Florence might let Mary, through a telephone connection, propose the activity to Susan. 3. Florence detects that Mary did not use this service for long, so Florence suggests Mary to start the service.
Preconditions *	Mary is not involved within another service Florence robot is not used by another service
Triggers	Mary asks Florence to join in a collaborative activity
Postconditions *	Florence proposed Susan to start a collaborative activity
Error conditions/Exceptions */2	1. Florence cannot contact Susan: tells Mary that Susan is not available, proposes to contact another person or to close the service.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	Invite User (internal)
Assumptions (Optional)	The collaborative activity has been started correctly

Element name	Pre-accept invitation by telephone
Use Case ID *	**COLGAM.0002**
Name *	Prepare all the components to start the playing activity, send the request to Susan by phone and Susan accepts the invitation by phone.
Version	1
Date	2010/12/02
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Florence system proposes Susan by phone to start the collaborative activity 2. Susan pre-accepts to start the activity 3. The Florence robot joins the playing site
Description *	Susan receives a phone call from Florence to invite her to start a collaborative activity. Mary and the Florence robot move to the playing site

Element name	Pre-accept invitation by telephone
Use Case ID *	**COLGAM.0002**
Priority	2
Actors	Susan (user)
Stakeholders	Susan: she receives a phone call from Florence and accepts the invitation Florence: moves to the playing site if it is needed
Basic course of action (path) *	1. Mary asks to Florence to make a puzzle and contact Susan 2. Florence contacts Susan by phone
Alternate courses of action (path) */2	None
Preconditions *	Complete use case COLGAM.0001
Triggers	
Postconditions *	Florence robot is at the playing site, as well as Mary
Error conditions/Exceptions */2	1. The Florence robot is not able to reach the playing site: Florence informs Mary, and asks her to direct the robot. 2. Mary is not reaching the playing site: check her position in the home. 3. The connection with Susan is not possible. Inform Mary.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	Invite user (internal)
Included use cases (Optional)	Robot to playing site (internal)
Assumptions (Optional)	Mary and Susan are ready to play

Element name	Accept invitation
Use Case ID *	**COLGAM.0003**
Name *	Prepare all the components to start the playing activity: accept the invitation through Florence or using the Florence remote website, then choose the puzzle *(any activity could be described)*To accept the invitation the users should previously move to the playing site (to the computer or to next to the Florence robot)
Version	2
Date	2010/12/02
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Florence system proposes Mary to reach the playing site. 2. The Florence robot joins the playing site 3. Susan connects to the Florence Website, confirming acceptance to join in the collaborative activity. 4. The Florence robot launches the videoconferencing with Susan 5. Mary chooses a physical puzzle 6. Florence robot asks Mary to show the drawing 7. Florence robot camera detects it and keeps the corresponding image in memory 8. Florence Website presents the image to Susan
Description *	Mary and the Florence robot move to the playing site, and Susan connect to the Florence Website. While the

Element name	Accept invitation
Use Case ID *	**COLGAM.0003**
	videoconference connection with Susan is done, Mary chooses the puzzle she wants to make. The Florence robot remembers the view of the drawing in order to present it to Susan when needed.
Priority	2
Actors	Mary and Susan (the users)
Stakeholders	Mary: she chooses a puzzle and shows it to Florence robot. Susan: she is able to visualize the image of the drawing to be done Florence: moves to the playing site if it is needed
Basic course of action (path) *	1. Mary ask to Florence for making a puzzle and contact Susan 2. Florence contacts Susan 3. Florence proposes to Susan for making a puzzle by phone 4. Susan pre-accept the invitation by phone 5. Susan accept the invitation connecting to the Florence Website 6. Florence proposes to Mary to choose a puzzle 7. Florence moves to the playing site
Alternate courses of action (path) */2	1. Make a Sudoku, Cross-words, … Florence robot sends to Susan a view of the paper onto which is locate the game. 2. Play Chess or Dame: show the location of the game 3. Play domino or cards: Florence robot provides to Susan a view of the game place (to be defined, and surely changed), as well as a view of her cards/ tiles.
Preconditions *	Complete use case COLGAM.0001 Susan and Mary accepted to play together
Triggers	
Postconditions *	Florence has memorized the drawing of the puzzle
Error conditions/Exceptions */2	1. The Florence robot is not able to reach the playing site: inform Mary, and ask her to direct it. 2. Mary is not reaching the playing site: check her position in the home. 3. The connection with Susan is not possible or Susan didn't accept the invitation even if she pre accepted. Inform Mary. 4. Florence cannot see properly the drawing: ask Mary to show him the drawing again 5. Florence cannot transmit the image of the puzzle to Susan. Inform Mary of the communication problem, and try to phone her. If error is persistent, quit game and notify it to the user, or try to contact another player, if Mary agrees on it.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0002 – Pre-accept invitation by phone Invite user (internal)
Included use cases (Optional)	Robot to playing site (internal)
Assumptions (Optional)	Mary and Susan are ready to play

Element name	**Change viewpoint**
Use Case ID *	**COLGAM.0004**
Name *	Change remotely the viewpoint of the robot. Before moving the viewpoint the robot should memorize the current viewpoint.
Version	2
Date	2010/12/02
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Susan wants to see an area that is currently out of the camera's scope 2. Susan requests Florence robot to move its camera 3. Florence Website memorizes the current camera position 4. Florence Robot moves its camera 5. Florence waits for more instructions
Description *	Susan wants to see a different area of the table to have a different view.
Priority	4
Actors	Susan (the user) Camera of Florence robot
Stakeholders	Susan: she gives the instructions to Florence to change the viewpoint Florence robot: it moves its camera
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence 2. Susan wants to change its field of view
Alternate courses of action (path) */2	1. In other collaborative activities: Susan needs to see something that is out of the field of view of Florence robot camera 2. Move the camera or the robot to a previously memorized location. 3. Susan may click on the image to define the area to move to.
Preconditions *	Susan and Mary are playing together. In the case that Florence has to move to a previous position this needs to be memorized beforehand.
Triggers	Susan requests to change the viewpoint of Florence robot camera
Postconditions *	The Florence camera is showing a different part of the table set.
Error conditions/Exceptions */2	1. The Florence robot can not realize the specified motion: it informs Susan that this movement is not possible 2. There's no position that has been previously recorded: informs Susan and proposes here either to store the current position, or to manually move the camera.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0007 – Suggest new event
Included use cases (Optional)	Move camera (internal)
Assumptions (Optional)	Florence robot's camera is showing the part of the table that Susan wanted

Element name	Point area to focus on
Use Case ID *	**COLGAM.0005**
Name *	Make zoom with the camera in a specific area the user pointed at.
Version	2
Date	2010/12/02
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Mary points a location on the table 2. Florence's robot detects this pointing action 3. Florence robot zooms with its camera on that location 4. Florence robot waits for new instructions
Description *	Mary indicates (with her hand) a region of interest and the Florence robot provides to Susan the functionality to automatically adapt the camera position and zooming in order to better observe this area.
Priority	5
Actors	Mary (the user) Susan (the user) Florence robot's camera
Stakeholders	Mary: she points an area in the game Susan: authorize the robot to zoom on the proposed location Florence: detects the pointing, and focus its camera onto that area
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence 2. Mary wants to specify a specific area to Susan
Alternate courses of action (path) */2	None
Preconditions *	Susan and Mary are playing together.
Triggers	Mary points a location in the table
Postconditions *	The Florence camera is showing a different part of the table set-
Error conditions/Exceptions */2	1. Florence has not realized that Mary is pointing: no solution
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0007 – Suggest new event
Included use cases (Optional)	Move camera (internal)
Assumptions (Optional)	The Florence camera is focused on the location that Mary pointed

Element name	Share game information
Use Case ID *	**COLGAM.0006**
Name *	Share information about the collaborative activity
Version	2
Date	2010/12/02
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	

Element name	Share game information
Use Case ID *	**COLGAM.0006**
Due date	
Event identifier(s)	1. Susan asks Florence Website to send her current view to Mary 2. Florence proposes Susan to add some graphical element (points, circle, rectangle) 3. Susan adds graphical information and validates 4. Florence shows Mary the tagged image onto the Robot Touch screen 5. Florence points the area that Susan indicated using a laser 6. Florence waits for new instructions
Description *	Susan wants to indicate a specific area to Mary. Florence transmits to Mary this information through the delivery of an image
Priority	6
Actors	Susan and Mary (the users) Florence: camera, screen, laser pointer
Stakeholders	Susan: she selects an area Florence: Website sends the tagged image, the robot touchscreen displays this image, and the laser pointer focuses in the table area
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence 2. Susan wants to focus in a specific area
Alternate courses of action (path) */2	1. Susan defines an area of interest to Mary 2. In a Sudoku, Crossword, … Susan can propose a solution for this area. This would add the following event: a. Susan proposes a solution b. Florence tells Mary the solution for the given area c. Mary uses the solution
Preconditions *	Susan and Mary are playing together.
Triggers	Susan points remotely an area on the table
Postconditions *	Florence robot displays the image in its touchscreen and points the area in the table using a laser
Error conditions/Exceptions */2	1. Susan does not validate the image to send: remind it to Susan and propose to cancel the action.
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0004 – Change viewpoint COLGAM.0005 – Point area to focus
Included use cases (Optional)	
Assumptions (Optional)	Florence displays the image in its touch screen and points the area in the table using its laser

Element name	Suggest new event
Use Case ID *	**COLGAM.0007**
Name *	Florence proposes the users to continue collaborating
Version	2
Date	2010/12/02
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	

Element name	Suggest new event
Use Case ID *	**COLGAM.0007**
Event identifier(s)	1. Mary and Susan did not collaborate for a long time 2. Florence detects it 3. Florence proposes Mary and Susan to continue playing 4. Mary or Susan make a change in the game 5. Florence is aware of the change 6. Florence starts counting time (to know how long is from one event to next one) 7. Florence waits for new instructions
Description *	Dynamizing the game
Priority	7
Actors	Florence
Stakeholders	Florence: is aware than no changes took place for a long time and suggests to continue playing Mary/Susan: make a change in the game
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence 2. There are no changes in the game since a long time
Alternate courses of action (path) */2	1. Susan or Mary have problems to continue the game: Florence should detect that they cannot continue by themselves and has to help them. Then go to step 2.
Preconditions *	Susan and Mary are playing a collaborative game using Florence, but there have been no changes since a long time
Triggers	Florence understands that the game is continuing
Postconditions *	Florence detects changes in the game from Mary or Susan
Error conditions/Exceptions */2	1. Florence does not receive any answer or change from Susan or Mary for a while: try it again (go to step 1) 2. Florence does not receive any answer or change from Susan or Mary for three times: stop the service (go to COLGAM.0008)
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	Mary or Susan make changes in the game

Element name	Close service
Use Case ID *	**COLGAM.0008**
Name *	Finish the game
Version	2
Date	2010/12/02
Author(s)	Ainara Garzo (Tecnalia, ainara.garzo@tecnalia.com) Leire Martínez (Tecnalia, leire.martinez@tecnalia.com)
Change history [Optional]	
Due date	
Event identifier(s)	1. Mary tells Florence that she wants to quit the game 2. Florence tells Susan that Mary wants to quit the game 3. Susan acknowledges it onto Florence website. 4. Florence stops the videoconference connection

Element name	Close service
Use Case ID *	**COLGAM.0008**
	5. Florence stops the service
Description *	The game is finished
Priority	3
Actors	Mary and Susan (the users)
Stakeholders	Mary: she asks to quit the service Florence: closes the videoconference connection, and then finishes the service
Basic course of action (path) *	1. Susan and Mary are playing a collaborative game through Florence
Alternate courses of action (path) */2	1. Susan wants to finish the game: Florence informs Mary about this, Mary agrees and then Florence goes to step 4 2. Susan wants to finish the game: Florence informs Mary about this, Mary would like to continue, so Florence tries to suggest other people Mary can collaborate with.
Preconditions *	Susan and Mary are playing a collaborative game using Florence
Triggers	Mary wants to finish the game
Postconditions *	Florence informs both users and the connection and the service are stopped
Error conditions/Exceptions */2	1. Florence cannot inform Susan: inform Mary about it and send the message to Susan later 2. Susan does not answer to Florence for a while: inform Mary about it and send the message to Susan later
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	COLGAM.0007 – Suggest new event
Included use cases (Optional)	
Assumptions (Optional)	The connection and the service are stopped

10.8 LOGSYS: After focus groups feedback (Version A)

This figure shows the use cases for the LOGSYS scenario. Most of the use cases are quite similar, they all deal with viewing, requesting or checking user related data.

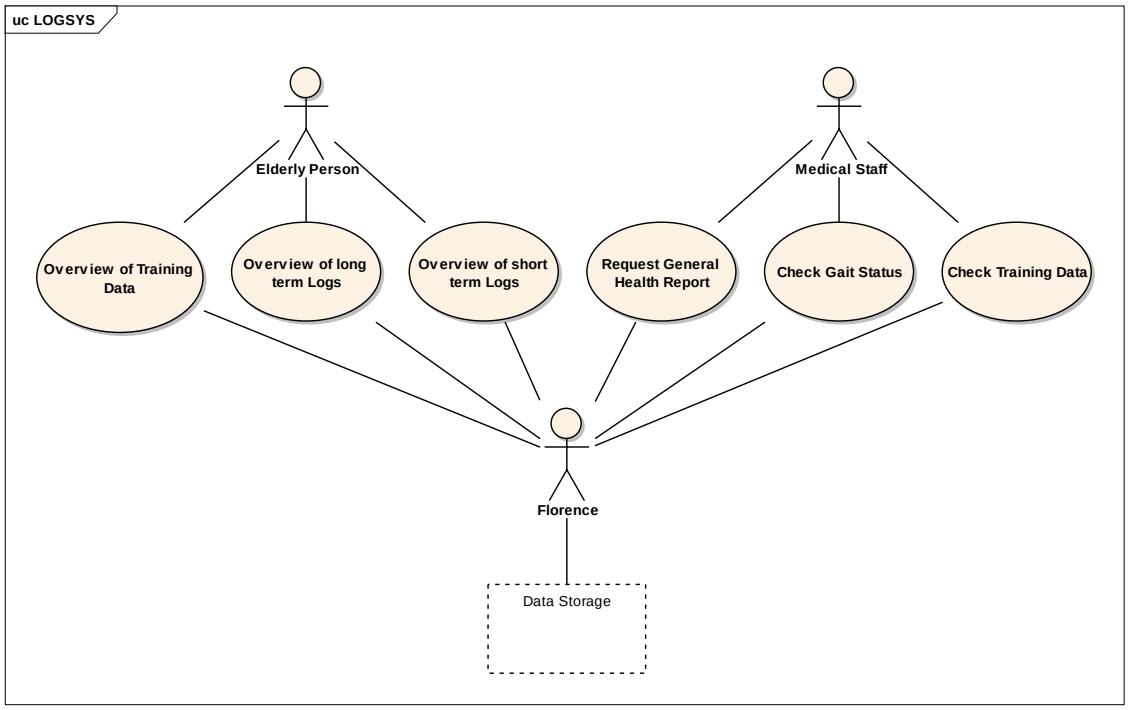

Table 32. LOGSYS use case diagram

Element name	**See logged data**
Use Case ID *	**LOGSYS.0001**
Name *	User wants to view logged data
Version	1
Date	2010-11-12
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The user wants to check the status of his training progress, health data or monitoring data.
Priority	normal
Actors	Elderly person Florence Robot
Stakeholders	Elderly person
Basic course of action (path) *	1. The user approaches the robot, instructs to show the training data
Alternate courses of action (path) */2	
Preconditions *	Robot service is available (no alarms present etc.)
Triggers	User chooses application from the robot software
Postconditions *	Data is displayed
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	Only few number of people have access to this data, not everyone that approaches the robot

Element name	**See loged data remotely**
Use Case ID *	**LOGSYS.0002**
Name *	External user wants to view logged data
Version	1
Date	2010-11-12
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	An external user wants to check the status of the training progress, health data or monitoring data.
Priority	normal
Actors	External person (Doctor etc.) Florence Robot
Stakeholders	External person (Doctor etc.)
Basic course of action (path) *	1. The user connects to the robot via remote interface
Alternate courses of action (path) */2	
Preconditions *	Robot service is available, Robot connected to internet gateway
Triggers	User chooses application from the robot software
Postconditions *	Connection is established
Error conditions/Exceptions */2	No connection possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	Only few people have access to this data, not everyone that approaches the robot, the doctor should have access and maybe also someone from family

Element name	**Check training data**
Use Case ID *	**LOGSYS.0003**
Name *	Overview of training Data
Version	1
Date	2010-11-11
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The user wants to check the status of his training progress; the robot has logged the training and provides results.
Priority	Normal
Actors	User Florence Robot
Stakeholders	User
Basic course of action (path) *	1. The robot checks database for available training data 2. The data will be rendered to visualize training progress and is presented to the user
Alternate courses of action (path) */2	

Element name	Check training data
Use Case ID *	**LOGSYS.0003**
Preconditions *	Some training data has to be logged before
Triggers	User chooses application from the robot software
Postconditions *	User closes application software
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Check long term status
Use Case ID *	**LOGSYS.0004**
Name *	Overview of long term Logs
Version	1
Date	2010-11-11
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	The user wants to check the status of his overall health and training status, the robot provides long term trends of data changes
Priority	normal
Actors	User Florence Robot
Stakeholders	User
Basic course of action (path) *	1. The robot checks database for available data 2. The data will be rendered to visualize long term trends and progress and presents this to the user 3. The user can deduce e.g. the need of change in lifestyle
Alternate courses of action (path) */2	
Preconditions *	Some data has to be logged before
Triggers	User chooses application from the robot software
Postconditions *	User closes application software
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Check short term status
Use Case ID *	**LOGSYS.0005**
Name *	Overview of short term Logs
Version	1
Date	2010-11-11
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	

Element name	Check short term status
Use Case ID *	LOGSYS.0005
Event identifier(s)	
Description *	The user wants to check the status of his current health and training status, the robot provides short term monitoring results
Priority	normal
Actors	User Florence Robot
Stakeholders	User
Basic course of action (path) *	1. The robot checks database for available data 2. The data will be rendered to visualize short term monitoring results and presents this to the user 3. Warnings in case of sudden value changes can be given to the user
Alternate courses of action (path) */2	
Preconditions *	Some data has to be logged before
Triggers	User chooses application from the robot software
Postconditions *	User closes application software
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	

Element name	Request general Health Report
Use Case ID *	LOGSYS.0006
Name *	Request general Health Report
Version	1
Date	2010-11-11
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	Medical personnel wants to check the status of the overall health and training status without moving to the users home or get the user to the office.
Priority	normal
Actors	External user (Doctor etc.) Florence Robot
Stakeholders	External user (Doctor etc.)
Basic course of action (path) *	1. The robot checks if the person has permission to get requested data 2. The robot checks database for available data 3. The data will be rendered to visualize long term trends and progress and presents this to the user 4. In case of critical values, the elderly person can be ordered to visit a doctor or to reduce / increase training efforts
Alternate courses of action (path) */2	

Element name	Request general Health Report
Use Case ID *	LOGSYS.0006
Preconditions *	Some data has to be logged before
Triggers	User chooses application from the robot software
Postconditions *	User closes application software
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	INCLUDE LOGSYS.0002
Assumptions (Optional)	

Element name	Check Gait status
Use Case ID *	LOGSYS.0007
Name *	Check Gait status
Version	1
Date	2010-11-11
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	Medical personnel want to check the gait velocity status of the elderly to deduce the fall risk of the person.
Priority	normal
Actors	External user (Doctor etc.) Florence Robot
Stakeholders	External user (Doctor etc.)
Basic course of action (path) *	1. The robot checks if the person has permission to get requested data 2. The robot checks database for available data 3. The data will be rendered to visualize long and short term trends and presents this to the user 4. In case of critical values, a care giver could be send to the home to check for or remove dangerous obstacles to reduce the risk of falls
Alternate courses of action (path) */2	
Preconditions *	Some data has to be logged before, remote user needs valid user account
Triggers	User chooses application from the robot software (can also be from remote side)
Postconditions *	User closes application software
Error conditions/Exceptions */2	If no data is present, the software should indicate that no analysis is possible
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	INCLUDE LOGSYS.0002
Assumptions (Optional)	

Element name	Disconnect from Service
Use Case ID *	LOGSYS.0008
Name *	Disconnect from Service
Version	1

Element name	**Disconnect from Service**
Use Case ID *	**LOGSYS.0008**
Date	2010-11-12
Author(s)	Melvin Isken, melvin.isken@offis.de
Change history [Optional]	
Due date	
Event identifier(s)	
Description *	External user has checked desired data and closes the connection
Priority	normal
Actors	External user (Doctor etc.) Florence Robot
Stakeholders	External user (Doctor etc.)
Basic course of action (path) *	1. The user disconnects from the Robot
Alternate courses of action (path) */2	
Preconditions *	User was logged in
Triggers	User chooses option within the robot software
Postconditions *	Connection disconnected
Error conditions/Exceptions */2	
Status	~~Draft | Pending bug fix | Stable |~~ Final
Frequency (Optional)	
Extended use case (Optional)	
Included use cases (Optional)	
Assumptions (Optional)	