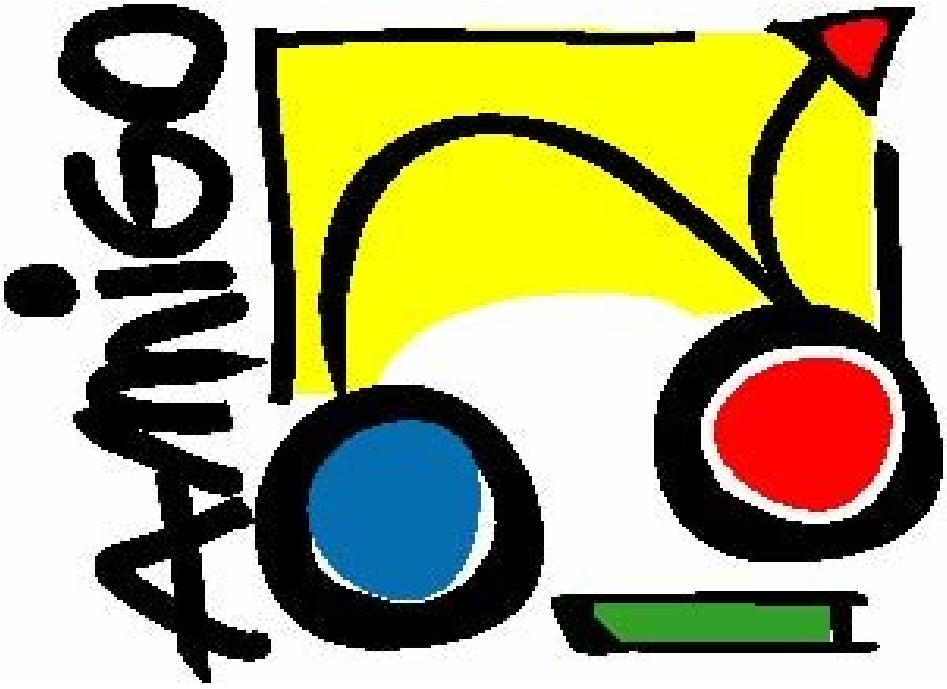

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Abstract

This document summarizes the user tests that have been done to verify the attractiveness of the applications and services developed in the project.

The last objective of user tests is to know the acceptance of the applications developed within Amigo, and to gather feedback about possible changes and improvements for them.

Given the time constraints of the WP8 and the prototype nature of the tested applications, the user tests results that we aim to obtain have been qualitative, rather than quantitative. The results should give us an idea how ambient intelligence systems are perceived.

User tests have been carried out with real demonstrators. The demonstrators have been installed in different labs from different companies to test each domain.

Keyword list

Ambient intelligence, networked home, application domain, home care and safety, home information and entertainment, extended home, testing lab, integrated demonstrator, user tests, warm-up, structured tryout, script, questionnaire, summarizing discussion.

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1 Introduction

The networked home, is a home in which several pieces of equipment are connected using an infrastructure, where the traditional separation of activities is no longer valid. This networked home environment leads to many new opportunities. The most important one is Ambient Intelligence, in which technology is completely integrated into our environment so people can freely and interactively use it. However, general user acceptance of home networking is not yet in place. To get broad user acceptance and fast market introduction two elements need to be resolved:

- Installation and use of the networked home system must be simple and user-friendly, that is the usability of the system must be high.
- Attractive applications and services must be present which clearly offer an advantage over what is offered by today's non-networked systems. Many of these applications will use new context and user information services in a way that is not possible in present non-networked systems.

In order to verify the attractiveness of the applications and services developed in the project, user tests will be carried out with real demonstrators.

This document describes briefly the labs where the demonstrator has been installed as well as the applications of each domain. Furthermore it describes how the user tests have been done.

Given the time constraints of the WP8 and the prototype nature of the tested applications, the user tests results that we aim to obtain will be qualitative, rather than quantitative. The results should give us an idea how Amigo-based ambient intelligence systems are perceived. Also they should help us to identify the most attractive applications. This information can than support exploitation of Amigo results.

2 User tests approach

2.1 Aim of user tests

The last objective of user tests is to know the acceptance of the applications developed within Amigo, and to gather feedback about possible changes and improvements for them.

2.2 Scope

The main purpose of these tests is to see if the applications showed in the demonstrators fit people's needs and daily behavioral patterns. This has been done paying special attention to the usefulness of the application and the ease of interaction.

Given the time constraints of the WP8 and the prototype nature of the tested applications, the user tests results obtained have been qualitative, rather than quantitative. The results should give us an idea how ambient intelligence systems are perceived.

The Demonstrators have been installed in five different labs from different companies. Each domain has been tested in one lab, except the Extended Home that has been tested in two. A description of the labs that have been used to do the verification and user tests, in each domain, can be found in the document "D8.1-Methodology and test plan".

2.3 Participants

A group of potential users has been formed trying to follow as much as possible the guidelines and profiles defined in WP1. This group has covered different ranges of age, civil states, life styles and work conditions.

The idea is to form a small user group for the testing session.

In every application domain particular criteria at the time of selecting people has been applied depending on the target users each application domain wanted to focus on. Also the number of users has been adapted to the criteria of each application domain. This is explained in the execution of the tests chapter.

3 General Procedure

In the original methodology the user tests were composed of four different parts, a “Warm-Up” to introduce the system to users, a “Structured Tryout” to show users which are the kind of things that can be done, a “Unstructured Tryout” to let the users command the system and a “Feedback Gathering” phase composed of a questionnaire and a summarizing discussion, to explicitly collect feedback.

In the following table it is shown how originally tests were structured:

Activity
Arrival, introduction and explanation
1. Warm up
2. Structured Tryout
3. Unstructured Tryout
Coffee Break
4. Questionnaire
5. Summarizing Discussion

Table1 - User testing procedure

However, this has been changed and adapted a bit to the needs of each application domain. It was not possible to make an unstructured tryout with users in a way that we were sure that the system will not stop working due to the prototype nature of the applications. As this may cause a negative reaction in users we have decided not to do this unstructured tryout.

The philosophy behind the user tests has been the one explained above but adapted to the needs of each testing site. An explanation will be included in the tests execution chapters.

4 User tests

A description of the user tests in each domain is enclosed below.

4.1 Home Care and Safety

To obtain feedback on demonstration and user testing on the Home Care and Safety domain, a demonstrator has been installed. This demonstrator is formed by a set of applications that have to be installed in DomoLab over the resources that maintain it.

DomoLab is a laboratory for experimenting with home automation and energy technologies in the home of the future located in the IKERLAN Technological Research Centre premises. The demonstrator has been installed in a room that simulates a home with a living room, a kitchen and a bathroom.

Figure 1 - Ikerlan Domolab: living room

Figure 2 - Ikerlan Domolab: kitchen

Figure 3 - Ikerlan Domolab: bathroom

A detailed description of the applications and its functioning can be found in the document "D5.4 - WP5 User Manual".

4.1.1 Personal Health Care Center

4.1.1.1 Brief application description

Personal Health Care Centre helps look after the health. The application collects health data from available (legacy) health devices, presents relevant information retrieved in the most suitable screen (the most suitable screen depends on the context and user preferences) and stores relevant health data in the user profile so that it can be used by other applications.

The Personal Health Care Centre allows user to change the health device configuration (time and date information).

The health devices are registered in the AMIGO System when they are turned on as devices offering health services.

The Personal Health Care Center application consists of the following components:

- weight scale
- blood pressure meter
- a PC/laptop in order to interact with the application
- a PC/laptop which serves as UPnP Proxy and hosts the application

4.1.1.2 Scenario

The test is carried out in the lounge, where the Tablet PC with which the user manages the application is located, together with the appliances making up the Personal Health Care Center (weight scale, blood pressure meter).

4.1.1.3 Scripts

Test 1

- Pablo gets home after basketball training. He always checks his blood pressure after taking exercise, as he likes to look after his heart.
- Pablo fits the blood pressure meter around his arm. He selects the different options on the Tablet PC: firstly he identifies himself by clicking on his photo, then he selects the blood pressure meter as a device, and then he takes the measurement. The blood pressure meter measures his blood pressure and sends the data item to the Amigo System, which registers it in Pablo's record. The PHCC automatically shows his blood pressure on the Tablet PC screen.
- Before Pablo has had time to read the measurement on the screen, the telephone rings. Pablo answers the call. When he sits back down in front of the Tablet PC, the information is no longer on the screen. Pablo selects the option for consulting the last measurement taken on the PHCC menu.

4.1.2 Health Management

4.1.2.1 Brief application description

The Health Management application is based on the home having a specific space dedicated to monitoring physiological values (bathroom). On that basis, it helps look after the health of those using it, by carrying out certain tasks involving information processing, trend checking and informing the users about any significant changes that need to be looked at by healthcare professionals.

Each user has an active RFID identifier which will enable the AMIGO middleware to know who is at home and the specific location of each person, so that the Health Management application knows who is using the physiological monitoring resources, thereby enabling the pick-up, storage, analysis and notification processes, if required, to be personalised.

The use of any of these systems will activate the Health Management application, which will store the data received in the historic records for the user and show the performance of the value measured using the AMIGO middleware interface resources: a mirror in the bathroom, a television set in the lounge and a Tablet PC.

If any problem is detected in the data analysis, especially any significant variation with regard to the trend for that value, the user will be informed or a notification will be send to a doctor.

The Health Management application enables configuration and follow-up of the health plan (which parameters it should control, how many times and how often) for each of the users.

The Health Management interacts with the user in two ways for presenting and requesting information or for giving messages: through voice messages and a display.

The user interacts with the Health Management using a remote control (PDA) or by voice command.

The Health Management application consists of the following components:

- weight scale
- blood pressure monitor
- ECG
- microx pulsoximeter
- a PC with communication resources for Power Line, WiFi and RF

4.1.2.2 Scenario

The user tests are carried out in two scenarios.

The first is the bathroom, where the Health Management application medical devices are located: weight scale, blood pressure monitor, ECG, microx pulsoximeter. It also has a mirror where information can be displayed.

The second scenario is the lounge, where there is a television set that can be used to display the health information the user wishes to consult, in addition to showing TV programmes. This information can also be displayed on a screen that is lowered when the projector installed on the lounge ceiling is switched on.

4.1.2.3 Scripts

Test 1

This test is performed in the bathroom.

- María goes into the bathroom to wash her hands before lunch. The HM identifies her.
- As María hasn't weighed herself for two weeks, the HM notifies her via a voice message that it would be a good idea to weigh herself.
- María decides to weigh herself, although she is a bit worried as she knows she has eaten too much over Christmas. She stands on the scales. The scales weigh her and send the data item to the AMIGO System. The AMIGO System records the data item in María's record.
- María's weight is displayed in the mirror. Luckily she has only put on one kilo!

Test 2

This test is performed in the bathroom.

- María calls Laura from the bathroom. Laura answers the call and goes into the bathroom. The HM recognises that both of them are in the bathroom.
- María wants to know if Laura has also put on weight over Christmas, and suggests Laura weighs herself while she, María, is washing her hands.
- Laura stands on the scales. The scales weigh her and send the data item to the AMIGO System.
- The HM recognises that the person being weighed is Laura and not María. The AMIGO System records the data item in Laura's record.
- Laura's weight is displayed in the mirror.

Test 3

This test is performed in the lounge.

- After a hard day at work, María is sitting comfortably in the lounge watching TV. An advertisement for a dietetic product comes on which suddenly makes her think of her daughter Laura.
- María is worried about her daughter's health. She decides to check how Laura's weight is going. She uses the PDA to select the option that will show her Laura's record.
- The TV programme is interrupted for a moment while the information María has requested appears on the screen.

4.1.3 Food Management

4.1.3.1 Brief application description

The Food Management application deals with food at home, the management of the goods in the fridge and the cupboards, the use-by date of the goods, a set of recipes.

It also deals with the profile of each family member related to food, ingredients liked/disliked, possible diseases, etc. Each family member sets his/her preferences and his/her height, weight and gender. Also, each family member specifies when she/he is going to have breakfast, lunch or dinner the following week.

Performing reasoning analysis on data related to each meal, Food Management suggests one suitable week menu for the whole family generating a shopping list by checking the household stock. If Food Management detects a product that needs to be used soon, the menu will be changed to include a recipe that uses that ingredient.

The Food Management as kitchen chef downloads recipes and cooking programs to the kitchen and displays them for easy food preparation, i.e., cooking along with the video. Moreover, the recipes always take the status of the provisions in the kitchen into account.

The Food Management maintains the overview of the food and household stock and generates shopping lists (fresh ingredients and non-perishable items) at predetermined time intervals. The shopping lists are personalized, but they take items that are on special offer, seasonal variations and nutritional balance into account.

The Food Management application consists of the following components:

- fridge with RFID infrastructure
- Tablet PC with WiFi
- a PC with communication resources for Power Line, WiFi and RF

4.1.3.2 Scenario

The tests are carried out in the kitchen.

The kitchen is equipped with all the usual domestic appliances: vitro-ceramic hob, oven, refrigerator, washing machine, etc. The refrigerator is equipped with a label reader to check the food items placed inside or taken out of it.

There is also a Tablet PC for user interaction with the FM application, and a wall screen displaying the information provided by the different applications.

4.1.3.3 Scripts

Test 1

- Jerry comes home after his yoga class as he usually does every Monday, and gets ready to go out to the supermarket to get his week's shopping. He uses the Tablet PC to request the shopping list from the FM.
- The FM automatically generates the shopping list, and two lists appear on the Tablet PC screen: one containing fresh products and the other containing non-perishable products.
- Jerry goes through the list and checks that tomatoes are on it. He remembers that he left a tray of tomatoes out of the fridge last week to ripen. He places the tomatoes in the fridge. The fridge label reader records this entry, and the FM immediately changes the list of fresh products, removing the tomatoes.

Test 2

- María is getting ready to make a meal. She consults the weekly menu generated by the FM on the Tablet PC to see what today meal is is. The FM suggests paella.
- However, the FM detects that the chicken in the fridge is due to reach its use-by date in two days' time. The FM modifies the menu to adapt it to the new requirements, swapping the paella for chicken curry.

  Note: a tray of chicken is placed inside the fridge to simulate this situation.
- When María opens the fridge to take out the paella ingredients, the FM informs her of the following with a voice message: "The chicken reaches its use-by date tomorrow. I've changed today's menu to include the chicken".
- María consults the menu again on the Tablet PC and checks that the FM is in fact suggesting chicken curry instead of paella.

Test 3

- Jerry is the only family member who has lunch at home, and so the FM always suggests a menu to suit Jerry's tastes and the low-salt diet he needs to follow. Today one of his favourite dishes is on the menu: stuffed aubergines.
- Pablo phones to tell his father that his classes at school have been called off that afternoon and that he will be coming home for lunch. Jerry quickly informs the FM that there will be one more diner, using the Tablet PC.
- The FM informs Jerry via a voice message that it would be a good idea to change the menu, as Pablo doesn't like aubergines.
- Taking the available food items and Jerry and Pablo's preferences into account, the FM modifies the menu anticipated for today and suggests a tasty, healthy Spanish omelette.

4.1.4 Appliances Management

4.1.4.1 Brief application description

The Appliances Management application manages the set of domestic appliances. The user has, regardless of where she/he is absolute control over their domestic appliances to switch them on, turn them off or know what their status is. If there is any problem with how they are working, the appliances will inform to technical service.

The user interacts with Appliances Management application using a remote control (PDA).

The Appliances Management application consists of the following components:

- washing-machine
- dishwasher
- oven
- boiler
- fridge
- induction hob
- a PC with communication resources for Power Line, WiFi and RF

4.1.4.2 Scenario

The user tests are carried out in two scenarios: the kitchen and the lounge.

The kitchen is equipped with the usual domestic appliances: vitro-ceramic hob, oven, refrigerator, washing machine, etc.

There is a PDA in the lounge.

4.1.4.3 Scripts

Test 1

This test should be carried out in the lounge, but the testing will actually be carried out in the kitchen, so that it is easier to check that the domestic appliance has started up.

- Pablo is stretched out on the sofa watching a football match. He suddenly remembers that his mother told him that she had left the washing machine ready and that he had to switch it on at around seven o'clock so that she would be able to hang the clothes out when she got home.
- Pablo doesn't want to get up off the sofa to switch on the washing machine, so he picks up the PDA and selects the washing machine on the AM menu, starting it up by remote control.
- In the kitchen, check that the washing machine has actually started up.

4.1.5 Entrance Manager

4.1.5.1 Brief application description

The Entrance Manager manages the front door events. The Entrance Manager is responsible for recognizing people at the front door of the house and opening the door for them depended on their authorization for such action.

Person is detected/identified by the face and voice recognition. If the person is known to the system a command is sent by Entrance Manager to the door to unlock and allow the person to enter.

If the person is a visitor, the person will be informed on non-availability of inhabitants, and will be asked to leave a message.

Special situations can affect the behaviour of the Entrance Manager, for example if AMIGO System has detected an emergency (like an elderly person has fallen and can't get up again), then the door should also be opened for e.g. ambulance personnel.

The Entrance Manager application consists of the following components:

- automatic door operator (lock and open/close)
- microphone and loudspeakers for speech input/output
- camera to be used by the face recognition

4.1.5.2 Scenario

The test is performed at the front door of the house.

There are two different detectors at the front door of the house for identifying the person standing at the door: a microphone for voice recognition, and a camera for face recognition.

When the front door is opened, the user enters the kitchen, where there is a wall display that shows the information provided by the different applications.

4.1.5.3 Scripts

Test 1

- Laura gets home after a tough day at school. The house has an intelligent door which recognises her family and friends. Laura looks at the camera on the front door and waits for the EM to let her in.
- The EM's face recognition and voice recognition system identifies Laura as someone who lives in the house and opens the door.
- When Laura enters the house, the EM greets her with a voice message: "Hello Laura. You're home early today!".
- On the kitchen wall display, the EM displays personalised information to Laura: she has received a call from a friend and she has three new e-mails.

4.1.6 Comfort System

4.1.6.1 Brief application description

The Comfort System application manages the environmental features of the home. The system should maintain the appropriate environmental conditions of the house (temperature, humidity, light, CO_2, etc.) adapting them to the user's preferences.

The home is divided in different zones; each room could be a zone. The environmental features of each zone can be managed individually. The Comfort System sets the environment of each zone depending on the preferences of the people that are present at the zone, or the people will be in the zone.

The user can set a temperature or profile for each zone, using the different interface available. A profile is a list of temperatures and timebands, so that a certain temperature can be programmed for a specific time of day, normally taking into account the times when there is no-one at home. These profiles can be different depending on whether the day is a holiday or a normal working day.

The Comfort System application consists of the following components:

- several temperature sensors with Bluetooth resources
- several actuators to activate and deactivate the electric heaters and the fans
- a lamp that lights up in different colours
- a PC with communication resources for Power Line, WiFi and RF

4.1.6.2 Scenario

The tests are carried out in two scenarios.

One scenario is all three rooms in the house: the kitchen, the lounge and the bathroom.

The second scenario is the lounge, where a temperature sensor, a fan and a lamp that can light up in different colours are installed. To simulate the CS application's performance the following have also been installed:

- a temperature sensor in the kitchen
- two lamps, one in the lounge and the other in the kitchen, so that the temperature variation in the room can easily be checked. The lamps change the colour of their light to reflect the temperature in the room (blue for cold, red for heat).

4.1.6.3 Scripts

Test 1

This test is carried out in all three rooms in the house.

- María is the first person to get home in the evening. The whole house is in darkness. When she enters the kitchen, the light comes on.
- She decides to have a shower to relax. But firstly she goes into the lounge to leave the post on the table. The lights come on in the room.
- When María goes into the bathroom, the lights come on too.

Test 2

This test is carried out in the lounge.

- Laura is quietly watching her favourite TV show on the television set in the lounge. After some time has elapsed, the CS changes the light in the lounge to blue (the colour assigned to Laura) to make the room more homely for her.
- John, Laura's grandfather, has decided to visit the family. He enters the house and sits down in the lounge to chat to Laura. After a while the CS starts to adapt the light conditions to the new situation, as it has detected that John is in the lounge. John's comfort profile takes priority over Laura's as he is older and more delicate, and so the CS changes the colour of the light from blue (Laura's colour) to green (the colour assigned to John).

Test 3

This test is carried out in the lounge.

- Jerry is enjoying watching an animal documentary on La2. The lighting in the lounge is soft, so that he can see the picture on the TV better.
- The documentary ends. Jerry switches off the TV and picks up the newspaper to have a read. He puts on his glasses and tells the CS "I need a reading atmosphere". The CS increases the brightness of the light in the room to make it easier for Jerry to read.

Test 4

This test is carried out in the lounge.

- It is summer and it is terribly hot outside. Pablo and Laura don't fancy going out as it's too hot: they prefer to stay in and watch a film. The CS detects that the temperature in the lounge is too high, as the sun has been beating down hard all day.

  Note: To get the temperature sensor to detect a sudden temperature increase, a person should move their hand close to the lounge sensor. To simulate a temperature increase in the lounge, the lounge lamp light goes from blue (cold) to red (heat).

- The CS starts up the fan in the lounge so that a more pleasant temperature is reached in this room, without changing the temperature of the other rooms.

  Note: To simulate a temperature drop in the lounge, the lounge lamp goes from red (heat) to blue (cold). Check that the temperature in the kitchen has not varied by checking that the lamp in this room has not changed its light colour.

4.1.7 Technical Alarms Management

4.1.7.1 Brief application description

The Technical Alarms Management application is able to detect any gas or water leakage. If any incidence is detected and, to avoid bigger disasters, the system automatically cuts down the supply of water or gas, depending on the leakage. The user is notified as soon as any leakage is detected.

The Technical Alarms Management application interacts with the user in several ways to send messages: voice message, display, and telephone call/SMS to the user.

The user interacts with the Technical Alarms Management application by voice command.

The Technical Alarms Management application consists of the following components:

- all the appliances connected to the Power Line
- sensors: water detectors, gas detectors
- actuators, valves
- a PC with communication resources for Power Line, WiFi and RF

4.1.7.2 Scenario

The user test is carried out in the kitchen, equipped with the usual domestic appliances (washing-machine, dishwasher, boiler, oven, etc.) and where the water and gas sensors and actuators are installed.

4.1.7.3 Scripts

Test 1

- While Jerry is watching TV in the lounge, a water leak occurs in the dishwasher. The TAM detects the leak. It cuts off the water supply to prevent flooding, switches off the dishwasher and issues the following voice message: “Alarm! There is a water leak from the dishwasher”.

  Note: During the test, the sink tap is left on so that the water supply situation can easily be checked.

  A contact is made manually in the detector to simulate the water leak. Check that the TAM has shut off the main water valve and that the tap is no longer running.

- Jerry goes into the kitchen to check the dishwasher installation. He realises that one of the pipes is a bit loose, so he secures it. He then cleans the water up off the floor so that it doesn’t drip through to the flat below, as he doesn’t want any problems with the neighbours.

  Note: The water detector contact is eliminated manually to simulate this situation.

- When the situation giving rise to the alarm has been resolved, Jerry asks the TAM to turn the water supply back on: “Everything’s fixed now, turn the water supply back on.”

- The TAM opens the valve again and starts up the dishwasher.

  Note: Check that the TAM has opened the main water valve by checking the tap is running again.

- Jerry goes back into the lounge and carries on watching the film, quickly forgetting about the incident with the dishwasher.

4.1.8 Questionnaire

The questionnaire is divided in two different sections: one gather general information from the user and another that will focus more on specific feedback from the different applications shown in each domain.

The questionnaire aims also to involve the users in expressing opinions about imperfections and possible foreseen improvements.

Questionnaire – Part 1: General Information

Name: ……

Surname: ……

Age: .....…….. ❑ Male ❑ Female

Civil state: ❑ Single ❑ Married

1. How many hours a day do you usually spend using electronic devices at work?
   - ❑ A. more than 4
   - ❑ B. from 2 to 4
   - ❑ C. less than 2

2. How many hours a day do you usually spend doing the household chores?
   - ❑ A. more than 4
   - ❑ B. from 2 to 4
   - ❑ C. less than 2

3. Are you worried about health control (weight, blood pressure, etc.)?
   - ❑ A. yes
   - ❑ B. no

Questionnaire – Part 2: Applications

1. Would you like to have this application in your home?

❑ A. yes

❑ B. no

Please, give a short explanation:

.....

.....

2. Do you feel at ease when your home “talks to you” or when you “talk” to your home?

❑ A. yes
❑ B. no

Please, give a short explanation:

.....

.....

3. Do you think that you have been in control of the application at all times?

❑ A. yes
❑ B. no

Please, give a short explanation:

.....

.....

4. Do you think the application maintains the security and privacy of your data?

❑ A. yes
❑ B. no

Please, give a short explanation:

.....

.....

5. Do you think that interaction with the application (voice, PDA, Tablet PC) is simple?

voice	❑ A. complicated	❑ B. relatively simple	❑ C. very simple
PDA	❑ A. complicated	❑ B. relatively simple	❑ C. very simple
TabletPC	❑ A. complicated	❑ B. relatively simple	❑ C. very simple

Please, give a short explanation:

.....

.....

6. Do you think sufficient information is provided by the application?

❑ A. insufficient
❑ B. some information is lacking

- ❑ C. sufficient

7. If you do not consider the information sufficient, what additional information would you like the application to provide?

.....

.....

8. From your point of view, what would you add/eliminate/change in order to improve the application?

.....

.....

.....

4.1.9 User tests methodology and execution

The user tests corresponding to the Health Care and Safety applications have been divided into three sets each of them has been performed in the related Domolab scenario. Therefore there were three test groups: bathroom tests, living room tests, kitchen tests. Each test set was conducted by a technician.

Figure 4 - Bathroom user test

Figure 5 - Living room user test

Figure 6 – Kitchen user test

To test Health Care and Security domain's application, six people have been selected.
The basic selection criteria for people were:

- three men and three women
- three young people and three middle age people

	men	women	TOTAL
young	2	1	**3**
middle age	1	2	**3**
TOTAL	**3**	**3**	**6**

We have worked with three user groups composed of two people:

- young man + middle age man
- young woman + middle age woman
- young man + middle age woman

The procedure carried out for the tests was the following:

- the three user groups took part alternately in the three test sets, consequently there were three test rounds.
- before carrying out each test set, a presentation for the participants of the latter test set was done. Each user group was located in a different room accompanied with the technician who performed the demonstrations.
- each user group moved into the assigned scenario (bathroom, living room, kitchen) for taking part into the corresponding test of this scenario.
- finally, once the tests of an specific scenario were completed, the users went back again to the room to fulfil the respective questionnaire.

Detailed information of user tests development can be found in Appendix Health Care and Safety-A.

The tests were conducted according to the following schedule:

Duration	Activity
5 min.	Arrival, introduction and explanation
5 min.	1.1. Warming up
15 min.	1.2. Bathroom scenario
10 min	1.3. Questionnaire
5 min.	2.1. Warming up
15 min.	2.2. Living room scenario
10 min	2.3. Questionnaire
15 min.	Coffee Break
5 min.	3.1. Warming up
15 min.	3.2. Kitchen scenario
10 min	3.3. Questionnaire
15 min	Summarizing Discussion

Table 2 - Schedule for conducting Health Care and Security tests user session

4.1.10 Conclusions and recommendations

The answers from the users were analyzed in a per scenario basis, paying special attention to two different aspects, the usefulness of the application and the ease of interaction. The summarizing discussion was also mainly focussing on these issues.

Kitchen scenario

Usefulness

In the kitchen scenario users liked most the food management application. They found it really useful because they said that deciding what to eat at every meal in a healthy and tasty way is not easy and this application will help. Furthermore it is a way of handling the shopping list, which users also appreciated. The possibility to configure it to your personal circumstances was also a highly ranked feature. However the way of introducing the profile was found quite tedious.

The entrance manager was seen as a good idea and an improvement over the current situation where you have to carry keys to enter your home. However, users were not very confident to rely on this system such an important task, because they were afraid of being hacked. There were comments in the direction that this system should be in the market for years without any incident before they will be confident to use one.

The application that had the worst acceptance was the appliance manager application. Users did not see the point on having such an application at home. Although young people told that controlling the appliances for the lounge while you are watching the tv might be interesting at some point, they find that commanding directly the appliances is much easier. Older user said that they will never use such a system at home. However, they suggested that this application can be of use to command the appliances when you are away from home, especially to turn on the central heating.

Ease of Interaction

Users found that touch screens for appliance manager and food management were good means of interface, they did not like to have a pen to touch it tough, they preferred to use the finger directly. The navigation system was not perceived as simple. Young people found quite intuitive, but they said that many interactions were needed to get something done what it made tedious. Older users found even sometimes difficult to navigate. For these two applications, the voice interface was seen as the best solution, even if some people stated that they were not very comfortable talking to a house. In this direction others pointed that day by day we are getting more used to talk to machines (normally on the phone) so why not to a house?.

For the entrance manager, they found very easy to say a pin code to enter the house.

Bathroom scenario

Usefulness

In the bathroom scenario both applications are seen as interesting. The technical alarms application gave people a good safety feeling. They like the water leakage detection but more the gas leakage, as this is dangerous.

The health management application is seen as a nice thing to have at home for young people but for older ones is perceived as a really helpful tool to control their health. Furthermore, they say that keeping a historic of some health parameters could also be helpful at the time of visiting the doctor. Here the main concern is about the privacy and ethical use of this data. They do not mind sending this information to a trusted doctor, but they will never share this information with anyone else.

Ease of Interaction

Here the same comments as in the kitchen scenario appear. Voice interaction is seen the best solution. Talking about touch screens, in the health application they will prefer the mirror were the information is displayed to be a touch screen and not to use another device to control the application. They said that the health management and food management have the same look and feel, so the navigation issues also apply for this application.

Lounge scenario

Usefulness

In the lounge scenario, the personal health care center is seen as quite redundant, differences with the health manager are not clearly appreciated. User said that does not make much sense to have them separated. They proposed to incorporate the extra features that the personal health care center offers to the heath manager or vice versa.

About the comfort systems application, they very much like the idea of having comfort profiles that will automatically control the comfort parameters. The idea of defining some scenes, like a watching a movie scene (controlling lights, blinds…) is very much appreciated between young people. However they say that defining these scenes should be very easy to do. Another concern is how the system will respond in the situation where people with different profiles enter the same room.

Ease of Interaction

Here the same recurrent comments as in the previous two scenarios appear. The only new comment is that using light colour to indicate the temperature in the room is seen as a fancy thing, especially between the young people.

4.2 Home Information and Entertainment

The Home Information and Entertainment demonstrator has been installed in the Telefónica I+D premises in the Walqa Technological Park in Huesca, Spain. It is a 5.3 x 5.45 m room that simulates a living room in a house where all the applications developed under this demonstrator have been integrated.

Figure 7 - View of the Home Information and Entertainment demonstrator

4.2.1 Home Agenda

4.2.1.1 Brief application description

Home Agenda, is the main application where the rest of applications in Home Information have been integrated. The main functionality is to manage the user's agenda data. This is done using an ontology based on the iCalendar standard that models these data. The model created is exported as a context source, so then other applications can benefit from the information stored in Home Agenda.

A very important part of this agenda is managing events. Each user can store and organize notes together with a description, activity, time, and people involved. The scheduler will synchronize each user's agendas after checking for the availability of the people involved and alert them of possible overlapping.

But there is not only note and description what an Amigo personal event comprises. The event may be just the execution of a determined service, provided any device or machine in the interconnected home environment, with certain parameters.

4.2.1.2 Scenario

The scenario in which the tests are carried out is anywhere inside the interconnected home environment. Each user has a PDA, previously configured for the owner. The users interact with Home Agenda & Monitor Manager with their PDA being able to manage their events.

4.2.1.3 Scripts

Test 1

- Marta created an event "Cycling" and selected whether it was a public or private event.

- The system exports that information as a context Source.
- The system shows the 'Cycling' event in My Agenda in today for the user Marta.

Test 2

- Marta clicks on 'My Accounts' to access information about the usage of services, for example, Marta can see the registers for every multimedia content purchased from an external server.

4.2.2 My News

4.2.2.1 Brief application description

My News offers a personalized recommendation of news to users based on the user preferences and categorization of news. The application shows several pieces of news matching the user preferences.

4.2.2.2 Scenario

The scenario in which the tests are carried out is anywhere inside the interconnected home environment. Each user has a PDA, previously configured for the owner. The users interact with My News with their PDA being able to read their personalized news. UMPS should be running in order to get the user's profiles and preferences.

4.2.2.3 Scripts

Test 1

- Marta access the 'Classic View by feeds' and selects a source.
- Marta edits the list of feeds.
- Marta access the 'Classic View by Topics'.
- Marta selects a topic to read news about that topic.

4.2.3 Monitor Manager

4.2.3.1 Brief application description

Monitor Manager, which goal is to monitor entities such as objects or children and then to notify Amigo users in a relevant way by using a particular entities' location. The demonstrator is coupled with a user agenda to anticipate users' needs, based on Agenda events and rules defined by the user.

Actual uses are quite various: ensuring that each entity is in the right place (namely to avoid stealing, home disorder or dangers to a child), locating objects, etc. Another use is preventing users from forgetting objects when going outside their home to attend a home agenda event.

4.2.3.2 Scenario

The scenario in which the tests are carried out is anywhere inside the interconnected home environment. Each user has a PDA, previously configured for the owner. The users interact with Monitor Manager with their PDA being able to manage their objects and create rules to monitor them. Any object that to be monitored will have an RFD sensor so that the monitoring manager knows where the object is at any time.

4.2.3.3 Scripts

Test 1

- Marta created an event “Cycling” and selected whether it was a public or private event.
- Marta created and Object and a rule for the Object, the ‘Bike’ rule.
- The system exports that information as a context Source.
- The system shows the ‘Cycling’ event in My Agenda in today for the user Marta.
- Marta goes out of the room without the bike and the application Monitoring Manager checks the rules for Marta and notifies Marta’s PDA that she has forgotten the Bike.

4.2.4 Media Manager Core

4.2.4.1 Brief application description

Media Manger Core is the main application that hosts the rest of applications in Home Entertainment. MMC takes the responsibility for browsing the content desired by the users depending on their profiles and context, and for adapting and later serving and playing the content on the most suitable renderer, such as a TV or a PDA. Hence, the application manages all activities related to content, browsing, description, repository and playback options like play, forward or pause following user preferences and profile and context information. The application directly interacts with the voice and gesture support shared services as well as background applications like Context-Dependent Personalization of Multimedia, Parental Control and Privacy Enforcement, which will be running at the same time the content is about to be rendered. It may indirectly interact with any other application requiring playback of content.

4.2.4.2 Scenario

The scenario in which the tests are carried out is anywhere inside the interconnected home environment. Each user has a PDA, previously configured for the owner. The users interact with Multimedia Manager Core with their PDA and with gestures, being able to browse contents, renderers and start multimedia sessions, as well as to manage the sessions.

4.2.4.3 Scripts

Test 1: Basic – Multimedia Sessions

- In the TV go to My Videos and mouse over through the movies. Play any movie in PHI.
- In the iPod go to My Music and play any song in the Noxon.
- In the TV go to My Sessions and see the previous active session with the movie and the song playing.
- Pause the movie in PHI.

Test 2: Guest Devices + Shared Content

- The guest takes a picture with his phone and…
- The guest makes the mobile phone available in the network.
- The application will discover the phone automatically.
- Its multimedia content will be available in the multimedia library there was already in the home.

- Go to My Pictures and play the new picture taken from the phone in the TV of the living room.

Test 3: Shared Content

- Check Nokia N93 status.
- Go to Browse Devices and share multimedia content on the phone.
- Go to My Pictures.

Test 4: Gestures

- With the Soap Server draw a “V” for My Videos.
- The most common movements available with this service are: Search, Play, Stop and Pause.
- Select any movie.
- Draw a “triangle” to play the movie in the TV of the living room.
- Draw a “Square” to stop it.

Test 5: Purchasing Contents from external servers

- Go to ‘My External Servers’.
- The System will show the available external servers.
- Select one.
- Click on Search to see the available multimedia content in the server, and click in ‘Buy’ in the desired content to purchase.
- The system generates a record that can be using for billing; the user can consult them in My Accounts in the Home Agenda.
- The purchased content can be accessed locally now.

4.2.5 Privacy Enforcement

4.2.5.1 Brief application description

Privacy Enforcement application is in charge of applying user privacy rules whenever the presence of another person is detected in the same area.

Privacy Enforcement is introduced to ensure privacy aware personalized content provisioning. When an Amigo user views content and does not want others to be aware that he/she is being provided with the specific content under the current circumstances, the system is able to configure this content view based on the user context. Thus, the system detects the presence of other humans in the area where the content delivery service is used and adjusts the view of the provided content accordingly. When the user is alone, the selected devices simply display the content requested. Whenever the presence of another person is detected in the same area, the system applies the privacy rules specified by the user turning the devices to stand-by mode for example. This way, the Amigo user keeps the usage of the specified content delivery private.

4.2.5.2 Scenario

The scenario in which the tests are carried out is anywhere inside the interconnected home environment. Each user has a PDA, previously configured for the owner. The users interact with Privacy Enforcement firstly defining the privacy rules for their contents. And then the

system will take them in account and every time there's a context change the rules will be checked.

4.2.5.3 Scripts

Test 1

- The user access 'My Videos'.
- The user plays the movie 'Transformers'.
- Marta enters the room.
- The system stops the movie applying the privacy enforcement rules.

4.2.6 Parental Control

4.2.6.1 Brief application description

Parental Control is responsible for checking whether an Amigo User is authorized to access media that is available only under parental permission. Parental control over content delivery services focuses on restricting a (usually juvenile) user's access to inappropriate content. This task is achieved by consulting the parents of the child on this matter. If the parents allow their child to access the specific content, then the Amigo system proceeds with the service delivery. Thus, the Amigo system initially retrieves information about the user (child) who wishes to access the specific content as well as information about the specific content. Content rating is modelled semantically with the content ontology. Rating is inferred with Parental Control rules and the movie genre present in the ontology.

If no rules have been established for the specific user and content or no explicit parental permission to access the content is in place, then the Amigo System attempts to reach one of his parents. Thus, it selects the device to be used in order to communicate with the parent and uses the selected device to send him/her a message requesting permission to deliver the specified content to the child. When the parent notices the message he/she replies to the system (they can approve or reject the playback from the PDA) which processes the reply and either starts the content delivery through the Media Manager Core or informs the Amigo User about not being authorized to access the specific content.

4.2.6.2 Scenario

The scenario in which the tests are carried out is anywhere inside the interconnected home environment. Each user has a PDA, previously configured for the owner. The users interact with Parental Control with their PDA being able to define rules to display contents. A user, that may be a child, attempts to start a multimedia session and the parental control triggers the necessary actions. Parental Control allows the user to go on with the multimedia session or will halt it, depending on the parents' response. The process includes the interaction between the child and the system and between the parents and the system.

4.2.6.3 Scripts

Test 1

- Show parental rules for the user 'father'.
- Another user, the 'child' tries to watch an inappropriate movie.
- The system sends a notification to the father's PDA.
- The father accepts or rejects the request to continue with the multimedia session.

4.2.7 Context Dependent Personalization of Multimedia

4.2.7.1 Brief application description

Context Dependent Personalization of Multimedia shows personalized selection of multimedia and/or home media based on user context. Suggestions about what to watch are personalized by using user profile information and user context information. Several users are recognized by the application for suggestions based on a combined context.

For example: selection of photos and videos which people watch depends on whom with they watch the video and what are they currently interested in.

Ability of Amigo system to present personalized suggestions to the users depends on:

- Available user context
- Multimedia preferences from the user profiles stored in UMPS
- Home Agenda Context Source.

Recommendations change when the context changes, which is for example when a new user enters the room.
For example, if Amigo system is not capable to recognize some context type which affects user's interests (e.g., if Amigo system can not recognize which people are going to watch photos or videos together), it might provide wrong suggestions, e.g., to ignore somebody's interests.

Apart from ability to recognize users' contexts, Amigo system should be able to learn user preferences from the history of multimedia retrieval cases. This is a challenging task because users are not willing to explicitly rank the videos, that is, to express how did they like the actors, the video plot, how suitable they consider the video for watching together with children or with guests and so on. Thus, Amigo system should not only acquire user's preferences explicitly, but also infer them from indirect clues. For example, if users never watch some video together with children, or even switch off the playback when the children enter a room, this means that they consider this particular video as unsuitable for children.

The demonstrator will be aiming to show how an intelligent home system can personalize suggestions to the users, based on the available contextual information and on application history.

4.2.7.2 Scenario

The scenario in which the tests are carried out is anywhere inside the interconnected home environment, normally in front of the TV for groups, or with any mobile device.

4.2.7.3 Scripts

Test 1

- Marta goes to users to see the multimedia preferences stored in UMPS.
- Marta goes to My Agenda and observes the event 'Egypt'.
- The system recommends a movie to Marta.
- Marta modifies her agenda.
- The system recommends a different movie to Marta.

4.2.8 Board Game

4.2.8.1 Brief application description

Board Game consists of a traditional, physical board game that uses ambient intelligence methods for enhancing the game experience. The board game can be controlled via physical figures, gestures, and speech and adapts the ambient atmosphere in the room (light, music, eventually wall displays) to the state of the game. The demonstrator uses and greatly simplifies the game mechanics of typical fantasy tabletop/role playing games. Figures representing fantasy creatures such as knights, ghosts, orcs etc. are placed on a physical game board and engage in a fierce battle. The goal of the game is to overcome the other players' figures and thus earn a higher score than the other figures that have lost. Figures are moved turnwise and perform actions such as casting magic spells, attacking other figures, or using enchanted artifacts.

Figures can be moved on the physical game board or on a graphical user interface as in a traditional video game. Gesture control is used for "magic wand" functionality, i.e. casting spells. The more powerful the magic spell is, the more complex becomes the gesture to perform. Therefore, it requires a bit of training with the gestures in order to use them most effectively.

The application integrates with the Media Manager Core (MMC) from which it can be started and terminated.

4.2.8.2 Scenario

The scenario in which the tests are carried out is anywhere inside the interconnected home environment, where the board game is installed. Each user has a PDA, previously configured for the owner. The users interact with Board Game with their PDA and with gestures.

4.2.8.3 Scripts

Test 1

- Users start a game, each user has a PDA.
- The PDA shows the private information about their character.
- The User performs an action.
- The system updates his context and the game's motor engine will know about the actions and or movements.
- The user repeats the action now with a gestures (i.e. moving forward or casting a spell)
- The system updates his context in the same way.

4.2.9 Questionnaire

1. Would you like to have the Home Information and Home Entertainment applications in your home?
   - ❑ A. yes
   - ❑ B. no

2. Do you find it easy to interact with the application?

Gestures	❑ A. complicated	❑ B. relatively simple	❑ C. very simple
Mobile Devices	❑ A. complicated	❑ B. relatively simple	❑ C. very simple
TV	❑ A. complicated	❑ B. relatively simple	❑ C. very simple

.....

.....

3. Which part of the application surprised you greatly most and why?

.....

.....

4. What could be improved in your opinion? Have you missed anything?

.....

.....

5. Do you consider the system is intelligent or on the contrary you think it just performs automatic tasks?

.....

.....

6. Do you feel you have control over the data, information and the system when you please?
   - ❑ A. yes
   - ❑ B. no

7. Do you feel the system is intrusive?
   - ❑ A. yes
   - ❑ B. no

8. You think the application provides...
   - ❑ A. insufficient information
   - ❑ B. enough information
   - ❑ C. sufficient information
   - ❑ D. too much information.

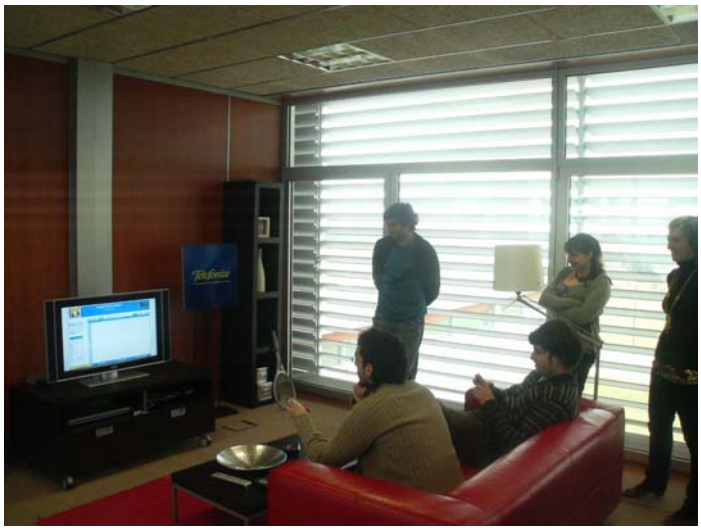
9. Do you find the number of devices needed to use the application excessive? If so, could you concrete in which part of the application gave you that impression?

.....

.....

4.2.10 User tests methodology and execution

The user tests corresponding to the applications have been performed in a living room scenario.



To test Home Information and Entertainment domain's application, sixteen people have been selected.

	men	women	TOTAL
young	5	4	**9**
middle age	3	4	**7**
TOTAL	**8**	**8**	**16**

The procedure carried out for the tests was the following:

- Before carrying out each test, a technician explains to the different users the main features of the Home Information and Entertainment. The technician performs de demonstrations of each subapplication and the users give their feedback about them to the technician.
- Finally, once all the tests of the applications included in Home Information and Entertainment were completed, the users fulfil the questionnaire.

The tests were conducted according to the following schedule:

Duration	Activity
5 min.	Arrival, introduction and explanation
5 min.	1.1. Warming up
20 min.	1.2. Home Information
10 min	1.3. Questionnaire
5 min.	2.1. Warming up
20 min.	2.2. Home Entertainment
10 min	2.3. Questionnaire
15 min	Summarizing Discussion

Table 3 - Schedule for conducting Home Information and Entertainment tests user session

4.2.11 Conclusions and recommendations

One of the goals of completing the users' test was to get a feedback to conclude the pros and cons of the Home Information Entertainment from the user point of view. Once the users' answers were analyzed we can state that:

Most users thought that, in general, the set of applications within Home Information and Entertainment were worth it. Moreover, the users were specially amazed by the interaction with the system, in special the ability to access to their multimedia content from any device in the house regardless of where the contents were physically located.

Automatic discovery of multimedia contents from guest devices was also among the most positively rated features by the users.

The use of the agenda as an integrated reminder with the users' objects was seen as something very useful and users were greatly surprised with it.

In general users were highly satisfied with the system in every aspect related to life's organization, which would include the Home Agenda, the Calendar and the Personalized News: they agree that these applications are time-saving. Moreover, they had a similar position with regard to Media Manager Core's recommendations based on the users' preferences.

On the other hand, the criticism of users will help us to improve the Application, for example now we are aware that the profile filling up interface is not as user-friendly as it should and that the system doesn't learn from the users' actions. Also while the users find the system useful for scheduling or reminding, which require the system to learn from their actions, a few users do not like the idea of being monitorized so much, so an agreement between these two policies or an opt-out option should lead to an improvement for users' experience

4.3 Extended Home

WP7 developed applications that lavarege Amigo middleware to offer communication means that support a shared feeling of presence between remote persons. The aim was to extend the home environment for both *interpersonal communication* and *shared activities*.

The WP7 demonstrator is composed of a number of interoperable applications that have been deployed in different laboratories for test and demonstration purposes. User-tests were performed in two of the labs. The testing procedures and the results are reported below.

A detailed description of the applications and its functioning can be found in the deliverable "D7.4 - Implementation of the Extended Home Environment Prototype".

4.3.1 Activity Sharing

4.3.1.1 Brief application description

Activity Sharing is a set of applications designed to run on a TV. They allow remote users to share photo albums and play arcade games while maintaining an audio-visual communication link.

4.3.1.2 Background

A major aim of the Amigo project is to provide individuals with services that enable them to easily and enjoyably share activities and experiences from the comfort of their own homes. In order for Amigo to succeed at defining, developing, and delivering useful services for the networked home environment, it is of the upmost importance to involve potential users of the system throughout the development process. Thus, this user test was conducted in order to obtain user reactions to one Amigo system prototype—specifically, the Extended Home Environment (EHE).

4.3.1.3 Goals

The three main goals of the user test were:

- Evaluate interconnectivity between devices within the home network environment
- Evaluate interconnectivity between separate households
- Evaluate the users' experiences while they communicate, share pictures, and play games

Specifically, a user test was conducted to examine the above two aspects of connectivity, that is, between devices within the home, and between independent households. In this test, two households were connected over a network using the Amigo interface. In addition, within the test "home," three devices were connected together: a television set, an iCat, and an Atmosphere Lamp. These devices were used during a picture sharing activity and while playing games (i.e., Four-in-a-Row, poker, and a quiz game). A final goal of the test was to evaluate the users' experience while engaging in the picture sharing activity and game play.

The next section of this report covers the user testing procedure employed; it is followed by the results of the test. Finally, the report ends with an interpretation of the analyses, and recommendations for improving the EHE user interface.

4.3.1.4 Scenario

Tests were conducted in actual households over a period of two days. Three flats in a student housing building located on the TU/e campus were used during the test (a schematic overview

of the flats appears in Figure 1.) Each flat served a different purpose during the test: (1) Flat 1 was used as a testing room; (2) Flat 2 was converted into an observation room; and, (3) Flat 3 was used as a response room. In the test room, pairs of users interacted with a pair of team members working from the response room. Different interoperable devices were placed within the test room; these included a television, an iCat, and an Atmosphere Lamp.

Four observers located in a separate room recorded the responses of the users during the test (i.e., two observers per user). Two additional observers recorded system failures and the length of time that it took for users to complete tasks. An overview of the specified use and contents of each of the three flats follows:

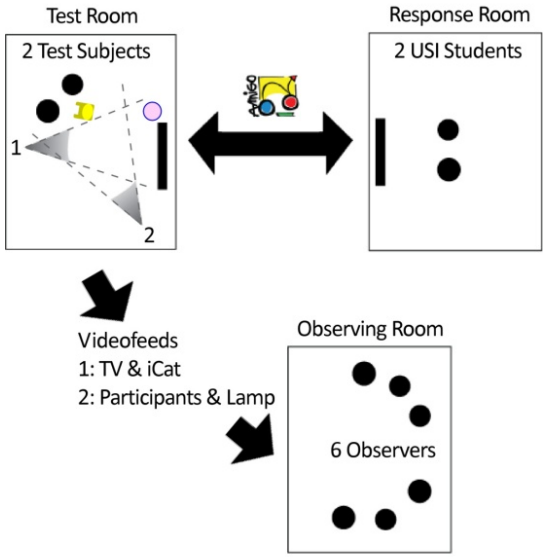


Figure 8 - Schematic overview of rooms

Flat 1: The testing room

Equipped with the following devices, which were used to test the EHE: an IP television; an iCat; one Philips digital photo frame; one Atmospheric lamp; a microphone; and a webcam.

In addition, two streaming-video cameras were used: one focused on the television screen, and the other camera focused on users' behaviors; the streaming video from these cameras was displayed in the Observation Room.

Users were tested in pairs and could be assisted by a technician; otherwise, the users performed the tests while being observed from a remote location (via streaming video).

Flat 2: The response room

Two confederates acted as respondents for the three scenarios while using an IPTV, microphone, and web-cam.

Flat 3: The observation room

Four observers (two per user) tracked the verbal and non-verbal behaviors of users while they performed task scenarios, and collect data.

4.3.1.5 User tests methodology and execution

4.3.1.5.1 Information-gathering interviews

Prior to conducting the user tests, interviews were scheduled with three Philip's representatives, i.e. W. Steenbergen (Business Manager Consumer Electronics), J. Moonen

(IPTV), and P. Vink (Technical Consultant of the Amigo project). The main purpose of the interviews was to discern the information that Philips sought to gain from the user tests.

A brief summary of some of the major themes that emerged from those interviews follows.

Importantly, all three the interviewees mentioned that one major goal of the Amigo project is to shift a number of online activities (such a video conferencing and sharing content) from the platform of the desktop personal computer to the living room television. However, this goal was stated with the caveat that generally, people are less tolerable of errors in the home living room environment. The supposed reason for this intolerance is that people are accustomed to operating devices in the living room, such as the standard television or DVD player, that work without notable failure the majority of the time. Therefore, another stated goal of the project is to create a system that works seamlessly and produces few, if any, errors. Moreover, the Amigo system has been developed to hide the overall complexity of its underlying operations in such a way that its users principally interact with a simplified and intuitive interface. Thus, this interface should be simple enough that even those who do not work regularly with computers should be able to operate the system with relative ease. NB, this system is not intended to replace desktop computing.

Two additional concerns voiced regarding the user test included questions regarding: (1) the kinds of experiences or interactions (e.g., communications with users in a remote location) with the system desired by potential users; and, (2) applications of the system that potential users might desire. It was also expressed during the interviews, that Philips is interested in people's opinions regarding the possibility of sharing content and information with other people at a remote location, via the television as a communication device, rather than a PC. A final relevant piece of information that stakeholders said they would like to gain from the testing regards the various possible methods that would enable users to interact with the television (e.g. remote control, virtual keyboard, etc.), and which of these is most preferred, and why.

4.3.1.5.2 Protocol

Briefly, the user test protocol included the following steps (relevant documentation of these steps can be found in Appendices Activity Sharing-A-C):

- Obtaining informed consent from the user.
- Completion of a pre-questionnaire.
- Brief instructions and demonstration of the television.
- User test of three scenarios.
- Post-test interview.

4.3.1.5.3 Detailed description of protocol

Users filled out a pre-questionnaire, listened to a brief description and watched a short demonstration of the EHE system, and then were asked to complete three test scenarios. The purpose of the scenarios was to test various aspects of the three goals stated in the Introduction. During Scenario 1, users uploaded, shared, and discussed pictures with a friend, "Nina," who was located in another household. In Scenario 2, users re-established a connection to Nina and played a game of Four-in-a-Row (Connect Four). Finally, in Scenario 3, users got a brief glance at the poker game before waiting for Nina to invite them to a quiz game match. During the quiz game, users interacted with the iCat and the Atmosphere Lamp. After the test was completed, users were interviewed regarding the tasks and the system.

4.3.1.5.4 Pre-test questionnaire

The questionnaire can be found in Appendix Activity Sharing-A.

4.3.1.5.5 Behavioral coding

During the test, user's behaviors were observed from a remote location via the use of streaming audio and video.

4.3.1.5.6 Post-test interview

Because of functional and technical limitations of the prototype used during the test (for example, the system would encounter a fatal error and require rebooting at least 3 times during each session), it was necessary to focus principally on conceptual aspects of the EHE, rather than the actual user interface in the interview. Thus, many of the questions in post-test interview addressed the users' opinions of the EHE concept. Specifically, users were asked questions regarding the concept of communicating with and sharing content via the television, as well as their response to the concept of interconnectivity of in-home devices. The questions used during the interview can be found in Appendix Activity Sharing-C.

4.3.1.6 Discussion

4.3.1.6.1 Considerations and limitations of the user test

Some limitations to this user test must be considered. Firstly, the version of the tested prototype was not robust. In other words, several errors occurred during the user test sessions. Therefore, multiple interventions by technicians were necessary during each test session to reboot the system. It is likely that these interventions have unfavorably skewed the results of this test, potentially causing users to react to various aspects of the system more poorly than they might have had the operation of the system been smoother. Secondly, although conducted in a real home environment, the test was a simulation. Users might behave differently in their own homes, while in front of their own televisions.

Thirdly, the number of participants in this test was relatively small (14) and the majority were university students (12). Therefore, the results of this test may not be valid for families, older professionals, or children. Finally, user interactions with the system were limited to 30 minutes and conducted during a single session. It is thus difficult to determine if users might have interacted differently with the system had they been given more time and/or practice.

4.3.1.6.2 Positive aspects of the system

- Users liked the opportunity to interact with others who were at a remote location.
- The interactivity feature reminded users of other platforms for communicating such as MSN or Skype, but they liked the fact that this system could be used from the television, without turning on a PC.
- All users had a positive reaction to the iCat when it turned on.
- Users like the concept of picture sharing, specifically, sharing pictures over the television and discussing them with others who were not present appealed to users.
- Users liked having the system in a living room setting.

4.3.1.6.3 Problem areas

- Feedback
    - Users wanted more feedback while sharing pictures because they did not know which pictures they were sharing at any given moment.
    - Feedback regarding system response and user actions (e.g., the programs don't include comprehensive system status messages or toggling buttons).
- Users did not understand the manner in which devices were connected, specifically, almost none of the users did not understand the function of the light.

- Users found the structure of the sharing pictures program difficult to use.
- Menu and navigational structures are inconsistent and confusing, e.g., games are not all located under the same menu option.
- Users found the use of the iCat to be confusing during game play with the other team.
- Users did not find the use of this system through a television to be an improvement over currently available systems (e.g., Microsoft XBOX and Sony Playstation).

4.3.2 Conclusions and recommendations

Based on the results of the user test, we would respectfully like to make the following recommendations.

4.3.2.1.1 General System

The menus and navigational structure could be revised to make them more intuitive, clear, and consistent. All games, for example, should be accessible from the games menu.

More feedback could be implemented into the system regarding

- system status (e.g. implement hourglass icons, more loading bars, etc)
- user actions (e.g., toggling buttons)
- which files/applications are being shared at any given time

Simultaneous information from different processes could be made multimodal or discontinued. For example, audio feedback from the iCat should not occur simultaneously as other aural cues.

Privacy issues should be considered priority items. For example, users should be given the choice whether to display their online status when logging in.

4.3.2.1.2 User Interface

The green button on the remote could always correspond with an affirmative (enabling) action and red could always correspond with a negative (inhibiting) action.

The interface could be customizable. Users could be able to change the appearance with a skinning feature or custom colors. A “favorite commands” function could help users adapt the interface to their individual usage patterns.

There could be an omnipresent “Help" button that provides information on the current screen/function.

Video chat could also be a stand-alone program.

An escape hatch could be implemented to enable users to explore more freely. This could take the form of an omnipresent “Home” button.

Simple animation or navigational breadcrumbs could be implemented to make the “movement” between submenus more clear to users.

4.3.2.1.3 Device Interaction

To avoid confusion, the iCat’s appendages could be given colors, so that they can be referenced as the (for example) “green paw” and “blue paw,” instead of left and right.

Perhaps the iCat could repeat its last output on command.

It would be useful if the iCat could respond to voice commands.

An optional pointing device could also augment the remote. Furthermore, a scrolling bar or wheel could make menu navigation easier and faster. In addition, the OK button should function consistently across all applications.

4.3.2.1.4 Privacy

A user should be able to toggle the broadcasting of her online status at any time. Furthermore, users should be able to permanently or temporarily block other users' ability to contact them. Many are already familiar with such functionality in existing chat applications and will expect the same from Amigo.

4.3.2.1.5 Conclusion

In conclusion, it is important to underscore that the dual concepts of interconnectivity between devices within the home, and between independent households, were well-received by users. Moreover, our recommendations deal principally with minor aspects of the operability of the system (e.g., increasing the consistency of the menu structures and the incorporation of more feedback to the user) and, as such, we believe can be readily resolved.

4.3.3 Feeling@

4.3.3.1 Brief application description

The aim of the Feeling@ application is to enable ambient communication and content sharing between two different locations. Places involved include the Home, considered as a single location for the whole family, the Office as a generic workplace, the Privacy Bubble intended as an ambient location with privacy enhancements and the Study as a sub-location of the Home inherently characterized by work enabled devices.

The Privacy Bubble, in particular, can be considered as a room inside the workplace defined as an extended home environment in office, a specific space dedicated to employees' private communication, having a feeling of being at home. In the same manner but in the opposite way, the Study is defined as an extended office environment inside the Home location. Just as the Privacy Bubble, the Study is a specific space dedicated to work activities that gives the feeling of being at the office.

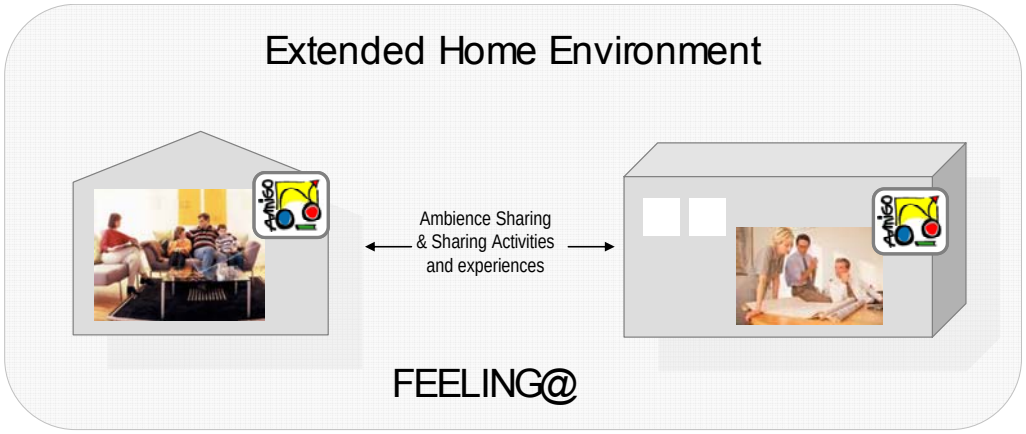


Figure 6 - Feeling@ application

The interaction between the specified locations happens in different ways and modalities involving communication between parties, usage of a variety of devices and sharing of content.

Direct communication is implemented as bidirectional audio-video conference between Home location (including the Study) and the Office (including the Privacy Bubble). Indirect communication is addressed by user messaging through SMS or email technology. All communication is mediated by presence and availability concepts. Content sharing, again, can be subdivided in direct user-conscious sending and receiving of data and indirect user-unaware synchronization of common information. The former is addressed by media content sharing (images basically) displayed on video screens, while the latter involves work activity scheduling, shared and updated between different locations.

The Feeling@ application is composed by the following building blocks:

- The RFID Reader;
- The User Notification Messenger;
- The Ambience Sharing;
- The Sketch Presentation;
- The Shared Organizer.

Furthermore, Feeling@ application is integrated with the following modules from WP4, WP6 and WP7:

- WP4: Context Management Service, User Modelling and Profiling Service; User Interface Service;
- WP6: Home Agenda;
- WP7: Palantir.

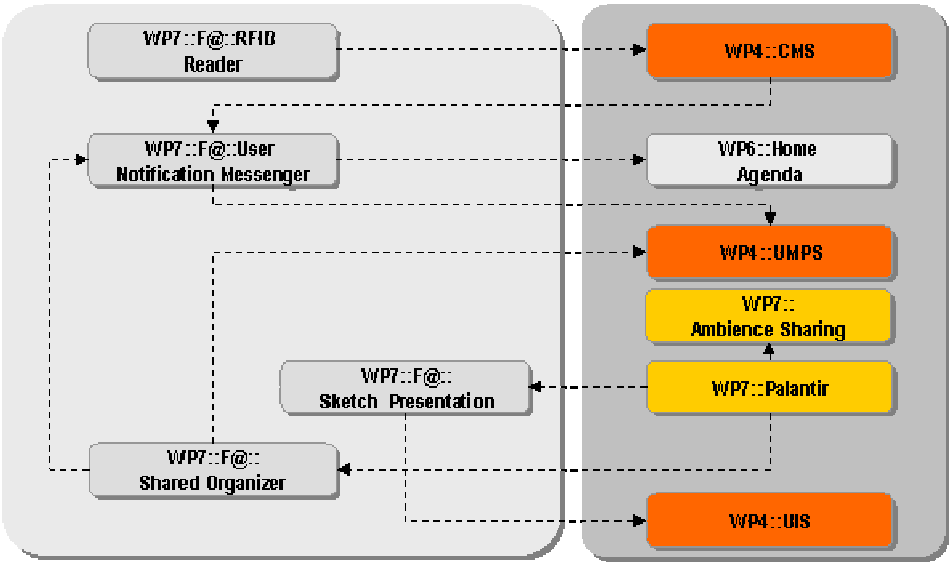


Figure 7 - Feeling@ Architecture

4.3.3.2 Scenario

The scenarios, for Feeling@ application, are two as the application involves two different domains: the Office and the Home. These domains will be simulated in two labs: Lab1, for the Office and Lab2 for the Home. Users will experience the Feeling@ functionalities and see the counterpart of the scenario by means of audio video communication.

Following, the map of the two labs.

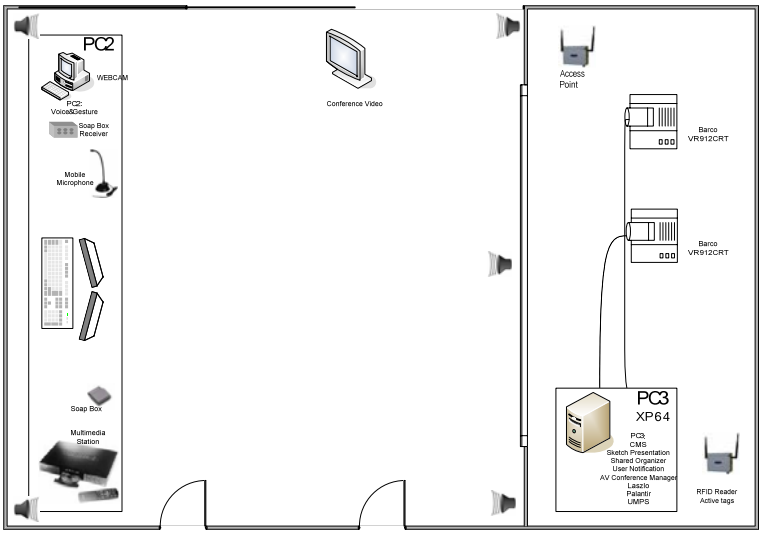


Figure 8 - IDG Lab1 (Office) map

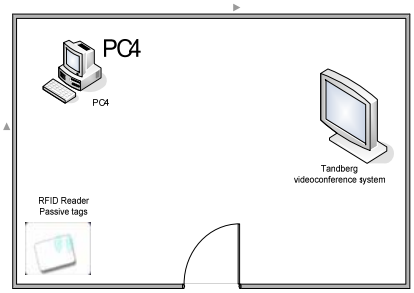


Fig. 9 - IDG Privacy Bubble - (Office) map

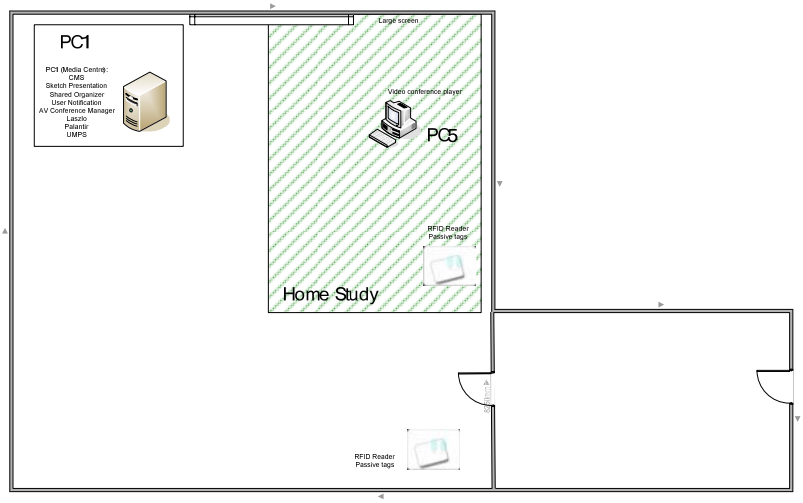


Figure 10 - IDG Lab2 - (Home) map

As for devices involved, Feeling@ provides location sensor support using RFID technology, audio-video conferencing deploying best-of-breed off the shelf products, large screen displays with touch screen options, wearable microphones for voice recognition and gesture interaction supporting VTT's SoapBox solution. All devices are integrated in the Amigo software stack and are offered to the user in an easy and intuitive way.

4.3.3.3 Scripts

Four different scenarios were shown to users by AmigoGuy1 and AmigoGuy2 (ITAL people directly involved in the Amigo project).

During testing sessions users were taken in the Lab1 which represents the Office domain by AmigoGuy1, who gave them a brief explanation of Feeling@ functionalities and goals.

The correspondent part of the application (home) was shown through video communication from Lab2, where AmigoGuy2 interacted with the application.

Test 1: Notification system

Feeling@ provides the possibility of having an unobtrusive notification system, able to propose the user all the information he/she wants to be constantly notified of from the home when he is away, for example at work. In the scenario, the foreseen situation is the unobtrusive notification of an unexpected event happening at home.

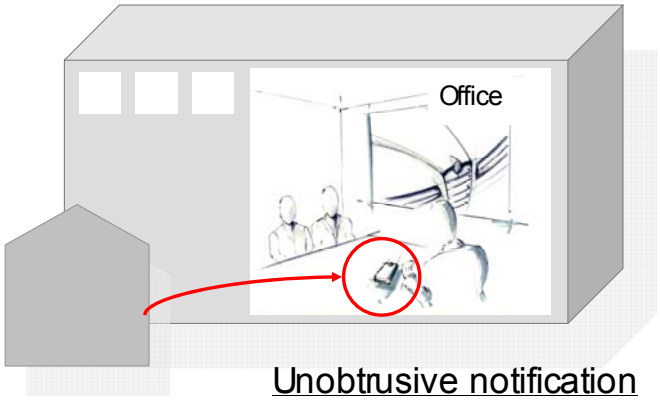


Figure 1 - Feeling@: Notification system

In the display, users see AmigoGuy2 entering home (Lab2): AmigoGuy1 receives an sms notification in the same time.

To sum up:

- Jerry is working with John and Paul on an important presentation;
- Meanwhile, Jerry's son, Roberto, comes back home before expected;
- Home RFID system recognizes Roberto. As Roberto is not expected to be at home at that time, the Amigo system sends a notification to Jerry;
- Jerry receives an SMS about the unexpected homecoming of his son Roberto;
- He moves to the company's "Privacy Bubble" to get in contact with Roberto at home.

Users see what is happening in the Lab2 thanks to an audio-video connection.

After having received a notification of an unexpected event happening at home, the users are asked to follow AmigoGuy1 in the Privacy Bubble, the space within the workplace specifically dedicated to privacy, in order to get in contact with the home.

Test 2: the Privacy Bubble

The Privacy Bubble automatically recognizes AmigoGuy1 and presents him his preferred settings: in the scenario proposed to the users, the Privacy Bubble allows an ambient audio-video communication with the home. The user starts the communication by touching the screen and the video communication with Lab2 starts.

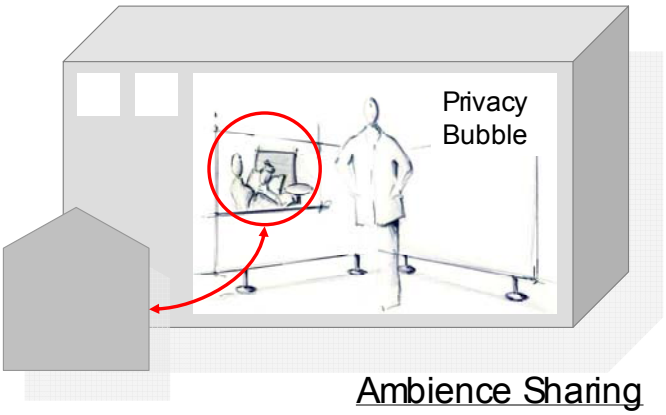


Figure 2- Feeling@: Privacy Bubble

To sum up:

- Jerry enters the Privacy Bubble and the RFID system recognizes him;
- The Amigo system proposes Jerry a communication with home;
- Jerry accepts the proposed communication by simply touching the screen;
- The communication starts: Jerry can see and talk with his son Roberto who is at home;
- After the conversation has finished, Jerry ends the communication by simply touching the screen.

After closing the communication with home, users are asked to follow AmigoGuy1 back to the Office.

Test 3: the Shared Organizer

Users are explained the possibility of using Amigo for being notified of activity status from distant locations and for sharing activities and contents between different places.

AmigoGuy1 notifies AmigoGuy2 about an activity completion. Users will see through a display what is happening in the Lab2. AmigoGuy2, having been informed of the activity completion, enters the Home Study (a specific area of Lab2), is recognised by the system and proposed a video communication with Lab1 (the office).

When he accepts the communication, the Sketch Presentation demonstration starts at Lab1.

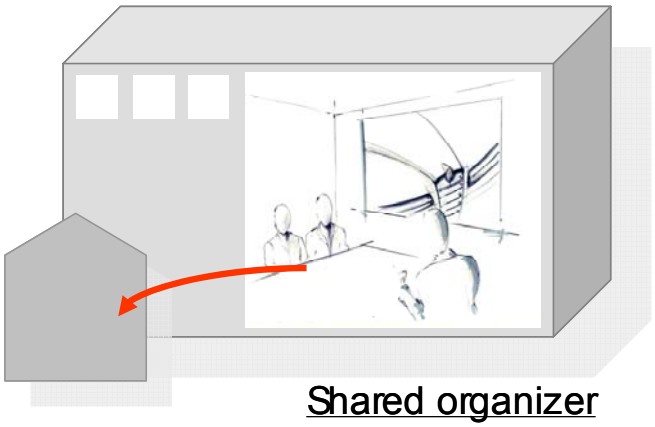


Figure 3 - Feeling@: the Shared Organizer

- To sum up:
- Jerry decides to leave the Office and goes back home;
- Meanwhile, John and Paul keep working on their presentation. When they finished the presentation they were preparing, they changed this activity status on the Shared Organizer GUI;
- The Amigo system notifies Jerry, who is at home, about the activity completion;
- Jerry receives a notification and moves to the Home Study;
- The Home Study RFID system recognizes Jerry and the Palantir GUI shows the presence status of his contacts;
- Jerry decides to start a communication with Paul so he chooses the Ambience Sharing application and selects his colleague picture;
- Paul, who is in the Office, accepts to communicate with Jerry by selecting Jerry's blinking picture;
- The communication between Jerry, who is in the Home Study and Paul, who is in the Office starts. At the same time, also the Sketch Presentation starts for both.

Test 4: the Sketch presentation

The Sketch Presentation is an application which allows users to share, modify and compare contents from different locations in an easy and intuitive way. In particular, the interaction with the system is guaranteed by the voice and gesture recognition. Users interact with the system by means of voice and gesture, sharing pictures and comparing them. Meanwhile, they see in a display what is happening at Lab2 (home) and they talk collaboratively with AmigoGuy2.

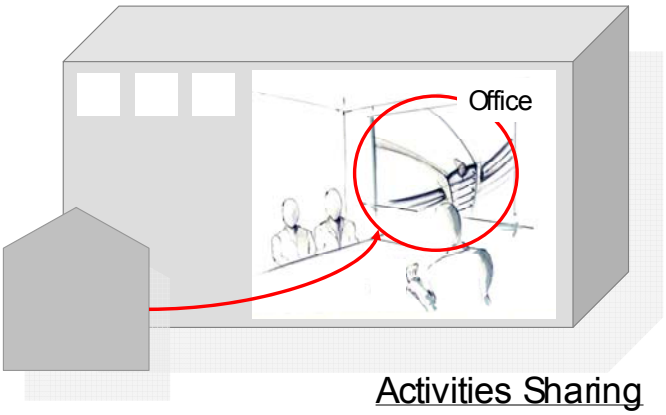


Figure 4 – Feeling@: Sketch Presentation

To sum up:

- In the Office, Paul moves through sketches by means of voice and gesture;
- Paul compares different pictures by voice and gesture commands;
- Jerry, who is at home, is satisfied with the work done, but asks to change an image.
- He compares this image with one of his own;
- He asks his colleagues to modify the sketch taking as a starting point the picture he has just proposed.

The session ends.

4.3.3.4 Questionnaire

Feeling@ application and uses were tested by a pencil-and-paper questionnaire. The questionnaire is divided in two different sections: one investigating general information about the users (to measure their technical background level), the other about Feeling@ scenarios, attractiveness and usability.

The questionnaires were filled out just after the interactive demonstration session with the users, when they were invited to see and experience the application functionalities, to ask questions and express opinions. The users filled the questionnaire out in about half an hour.

The questionnaire investigates both Feeling@ scenarios and general concepts. It aims also to involve the users in expressing opinions about imperfections and possible foreseen improvements.

The goal of the questionnaire is to test Feeling@ application attractiveness and usability in everyday life, both in a domestic and working environment.

Questionnaire results are a reliable measure of Feeling@ concepts and development, because a pen-and-pencil questionnaire gives the user time to reflect and weigh up his answers. The possibility of asking questions and receiving answers about interesting topics will give the user the possibility to interact and solve all the possible misunderstandings.

Questionnaire – Part 1: General Information

Name: ……

Surname: ……

Age: .....…….. Male □ Female □

Department: ……..…..

Position: ……

1. How many hours per day do you usually spend using electronic devices at work?
   - ❑ A. More than 4
   - ❑ B. From 2 to 4
   - ❑ C. Less than 2

2. What is the rate of information shared at work?
   - ❑ A. Very High
   - ❑ B. High
   - ❑ C. Low
   - ❑ D. Very Low

3. What are the most used tools to share information ?
   - ❑ A. e-mail
   - ❑ B. File exchanged
   - ❑ C. Common repositories
   - ❑ D. Other (specify): ……. ……

Questionnaire – Part 2: Feeling@ scenarios

1. What do you think of the possibility of having an unobtrusive **notification system**, able to propose the user all the information he/she wants to be constantly notified of (for example, information from home)? What would be the usefulness of such a tool?

- ❑ A. Very high
- ❑ B. High
- ❑ C. Low
- ❑ D. Very Low

Please, give a short explanation:

.....

.....

2. What do you think of having a specific area dedicated to private communication (**Privacy Bubble**) within the Workplace, to be accessed during working breaks? What would be the usefulness of having such an area, in a working context?

- ❑ A. Very high
- ❑ B. High
- ❑ C. Low
- ❑ D. Very Low

Please, give a short explanation:

.....

.....

3. What do you think of the having a specific application (**Shared Organizer**) for managing both your working and personal activities, able to notify you when an activity status changes?

- ❑ A. Very high
- ❑ B. High
- ❑ C. Low
- ❑ D. Very low

Please, give a short explanation:

……

…….

4. Did you find it difficult to interpret the presence status of remote contacts when showed as a patchwork of photos (**Palantir**)?

- ❑ A. Very easy
- ❑ B. Easy
- ❑ C. Difficult
- ❑ D. Very Difficult

Please, give a short explanation:

……

…….

5. Did you find it easy to start a communication by touching a picture of the interlocutor (**Palantir**)?

- ❑ A. Very easy
- ❑ B. Easy
- ❑ C. Difficult
- ❑ D. Very Difficult

Please, give a short explanation:

……

…….

6. What do you think of having a specific application aiming at sharing and comparing pictures between remote locations (**Sketch Presentation**)? What do you think of the possibility of interacting with such an application in an innovative way, that is, by means of voice and gestures? What would be the usefulness of having such an application in your daily activities?

- ❑ A. Very high
- ❑ B. High
- ❑ C. Low
- ❑ D. Very Low

Please, give a short explanation:

.....

.....

7. What do you think of Feeling@ application impact in every day activities? Do you think it would improve your working activities?

- ❑ A. Always
- ❑ B. Most
- ❑ C. Little
- ❑ D. Not at all

Please, give a short explanation:

.....

.....

8. What do you think of Feeling@ application impact in every day life? Do you think it could improve your spare time activities when you are at home?

- ❑ A. Always
- ❑ B. Most
- ❑ C. Little
- ❑ D. Not at all

Please, give a short explanation:

.....

.....

9. How do you think Feeling@ functionalities should be improved? Can you imagine other scenarios/activities Feeling@ application would be useful for?

Please, give some examples:

.....

.....

4.3.3.5 User tests methodology and execution

The test was meant to measure the attractiveness and applicability of the Feeling@ concept in every day life. The users were expected to appreciate the possibility of sharing presence feeling and activities between the home and other distant environments such as the workplace; in particular they were expected to welcome the feeling of being in touch with home and relatives during their working activities.

To test Feeling@ application, six people have been involved.

The tests were conducted according to the following schedule:

Duration	Activity
5 min.	Arrival, introduction and explanation
20 min.	1. Warming up
15 min.	2. Notification system
15 min.	3. Privacy Bubble interaction
15 min.	*Coffee Break*
30 min.	4. Shared Organizer
30 min.	5. Sketch Presentation
15 min.	*Coffee Break*
30 min.	6. Questions&Opinions
10 min.	*Lunch Break*
45 min.	7. Questionnaires
10 min.	*Unwinding; cooling down, debriefing*

Figure 5 - Schedule for conducting Feeling@ evaluation sessions

4.3.4 Conclusions and recommendations

Users' feedback was analyzed according to these four major issues: usefulness of ambient communication, ambient notification, context awareness and sharing information.

Following, the results of the questionnaires' analysis.

Unobtrusive notification system

Feeling@ application provides an unobtrusive notification system that allows people to be constantly notified of information they want to be informed. In the scenario proposed, users at

work are notified of unexpected events happening at home; on the other way, users at home are notified of working activities status change.

All test people stated that this kind of notification system is of high or very high interest to them. Users particularly appreciated the feeling of safety brought by such an application, that extended for future scenarios, would also give them the possibility of immediately react in emergency cases.

However, they stated that it will be of major importance to be able to easily select which kind of information shall be forwarded in order to avoid of being interrupted by 'useless' notification messages.

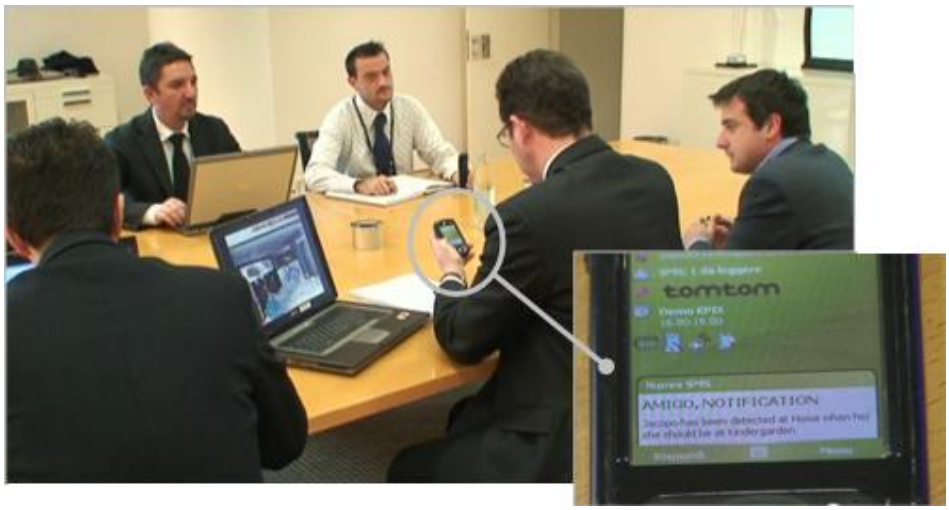


Figure 6 - Notification of unexpected events happening at home

Ambient Communication - Privacy Bubble interaction

The test persons were asked their opinion on having a specific area dedicated to private communication (the Privacy Bubble) within the Workplace, to be accessed during working breaks.

The testers were very interested in the ambient communication feature. They appreciated the recognition system of the Privacy Bubble, and they particularly appreciated the possibility of easily getting in touch with the home and relatives, even if they expressed strong concerns about privacy issues.

Some users also suggested to extend the target purpose of the Privacy Bubble also to other places like airports, train stations, etc.

Figure 7 - Privacy Bubble interaction

Sharing Activities – Shared Organizer

Testers used Shared Organizer for creating and updating common activities. They appreciated the interface, which is nice and easy to use, and also the mailing system which notifies users when an activity status changes.

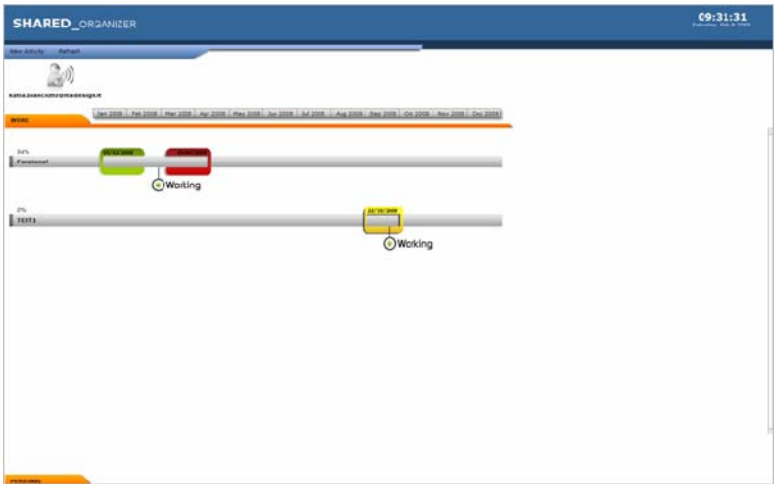


Figure 8 - Shared Organizer

Palantir – (France Telecom – tests performed in ITAL)

Due to technical problems in integrating the Palantir service with the Sketch presentation, the Palantir was tested only by five Ital Design employees that were familiar with the Amigo project. In general, users found that the Palantir GUI is easy and intuitive to use. Users were shown the Palantir GUI recognizing the user by the RFID system and displaying his contacts; they changed their presence status and started both video communication and Sketch Presentation through the Palantir GUI.
Users said that the GUI of Palantir could be graphically improved to be more appealing. However they had no difficulties in identifying available contacts and managed to select an application (Ambience Sharing, Sketch Presentation) and start it from the Palantir. Note that in

deliverable D8.2, functional verification revealed that users might complain about the rigidity of the interaction sequence necessary to start an application.

Figure 9 - Palantir GUI

Sharing Activities – Sketch Presentation

Testers used Sketch Presentation for moving and comparing sketches. To work with it, they used both gesture and voice recognition.

Sketch Presentation is particularly appreciated by users as sharing content between different locations is very important in employees' everyday work. Sketch Presentation is easy and intuitive to use, and testers appreciated the gesture and voice interaction.

Figure 10 - Sketch Presentation

To sum up the questionnaires results, strengths, weaknesses, opportunities, and threats involved in Feeling@ application concepts have been identified, according to the SWOT analysis principles, as shown in the following figure.

5 Appendices Home Care and Safety

5.1 Appendix A: Guide for the user test execution

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6. CUESTIONARIO 69

1. INTRODUCCIÓN

Se han diseñado 14 test de usuario correspondientes a las siguientes aplicaciones:

- Personal Health Care Center (PHCC) 1 test
- Entrance Manager (EM) 1 test
- Food Management (FM) 3 test
- Health Management 3 test
- Appliances Management 1 test

- Comfort System 4 test
- Technical Alarms Management 1 test

Los test de usuario se realizarán en la sala de demostración de Ikerlan. La sala está dividida en 3 escenarios: cuarto de baño, salón y cocina (incluyendo entrada al recinto).

Los test de usuario correspondientes a las siete aplicaciones se dividen en tres conjuntos, cada de los cuales se realizarán en uno de los escenarios antes mencionados. Por tanto hay tres grupos de test: pruebas en el cuarto de baño, pruebas en el salón, pruebas en la cocina. Cada conjunto de test será conducido por un técnico.

Se seleccionarán 6 personas para los test de usuario:

	hombre	**mujer**	**TOTAL**
joven	1	2	**3**
maduro	2	1	**3**
TOTAL	**3**	**3**	**6**

Se trabajará con 3 grupos de usuarios formados por 2 personas:

- hombre joven + hombre maduro
- mujer joven + mujer madura
- mujer joven + hombre maduro

El procedimiento que debe seguirse para la realización de los test es el siguiente:

- los tres grupos de usuarios realizarán alternativamente los tres conjuntos de test; por tanto se harán tres rondas de pruebas.
- previamente a la realización de cada conjunto de test, se hará una presentación para los usuarios que vayan a participar en esos test. Cada grupo de usuarios estará en un sala diferente acompañado por el técnico que realizará las pruebas.
- a continuación cada grupo de usuarios pasa al escenario asignado (cuarto de baño, salón, cocina) para participar en los test correspondientes a ese escenario.
- por último un vez finalizados los test de un escenario, los usuarios se dirigen nuevamente a la sala para contestar el cuestionario correspondiente a ese escenario.

El resto del documento describe detalladamente este procedimiento. Primero se resumen ciertas consideraciones y aspectos que hay preparar que hacer antes de comenzar los test (datos en AMIGO System, estado de los aparatos y electrodomésticos, identificaciones...).

En los capítulos siguientes, para cada conjunto de test, se describe el escenario dónde se van a realizar, la definición de los test que componen el conjunto y el guión que debe seguir el técnico.

También se añade un último capítulo con las preguntas del cuestionario, similar para todas las aplicaciones.

2. PREPARACIÓN DE LOS TEST

Antes de realizar cada una de las tres rondas de test, es necesario preparar tanto los distintos escenarios como las aplicaciones.

2.1 Tags de identificación

Únicamente es necesario utilizar tags de identificación en los test correspondientes a los escenarios *salón* y *cuarto de baño*.

Se dispone de 3 tags de identificación divididos en dos tipos:

- 2 tags (TAG-T) asignados a los técnicos que conducen los test del escenario *salón* y los test del escenario *cuarto de baño*.
- 1 tag (TAG-TA) asignado al técnico auxiliar que colabora en la realización de algunos test.

2.2 Orden de realización de los test

Conviene realizar los test en un orden determinado debido a las características de algunos de ellos.

Los test en los que el usuario interacciona con la aplicación mediante voz (TAM-Test1, CS-Test3) deben realizarse en un entorno de silencio para que el ruido ambiental no distorsione el mensaje. Por tanto es conveniente que, cuando vayan a realizarse, sólo esté presente dentro de la casa de demostración el grupo implicado.

El test CS-Test1 debe realizarse en primer lugar para que las luces de la casa de demostración estén apagadas.

Hay que tener cuidado para que la ejecución de los test en los que se necesita un segundo tag de identificación (CS-Test2, HM-Test2) no coincidan ya que sólo existen 3 tags.

El orden establecido para la realización de los test es el siguiente:

1. El grupo del **escenario *cuarto de baño*** entra en la casa, la puerta debe estar abierta y la casa a oscuras.

   Primero se realiza el CS-Test1 pasando por la cocina, por el salón y por el cuarto de baño.

   Dentro del cuarto de baño primero se realiza el TAM-Test1 (voz) cuando todavía no hayan entrado los otros dos grupos de usuarios en el recinto. El HM-Test2 (tag adicional) debe realizarse el último para que el tag adicional esté disponible.

2. El grupo del **escenario *salón*** no entra en la casa hasta que no haya finalizado el TAM-Test1.

   El grupo entra en la casa (la puerta debe estar abierta) y se sitúa en el salón.

   Dentro del salón se realiza el CS-Test2 (tag adicional) en segundo lugar para que el tag adicional esté disponible cuando se realice el HM-Test2 en el cuarto de baño. El CS-Test3 (voz) debe realizarse el último, cuando ya hayan salido los otros dos grupos de usuarios del recinto.

3. El grupo del **escenario *cocina*** antes de entrar en el recinto realiza el EM-test1 en la entrada, la puerta debe estar cerrada.

El grupo entra en la casa y se sitúa en la cocina dónde realizan los demás test.

2.3 Amigo System

PREPARACIÓN	TAG ASOCIADO	APLIC.	TEST
Definir un perfil de confort (color azul) sin preferencia. Técnico	TAG-T	CS	test2
Registrar un histórico de salud. Técnico	TAG-T	HM	test3
Registrar en el histórico de salud los datos de peso que permiten identificar a la persona. Técnico	TAG-T	HM	test2
Autorizar al usuario para anular alarma. Técnico	TAG-T	HM	test1
Definir un perfil de confort (color verde) con preferencia. Técnico Auxiliar	TAG-TA	CS	test2
Registrar en el histórico de salud los datos de peso que permiten identificar a la persona. Técnico Auxiliar	TAG-TA	HM	test2
Registrar la cara y el patrón de voz del técnico. Técnico	-	EM	test1
Definir un entorno de ambiente: entorno de lectura.	-	CS	test3
Registrar un menú semanal con una receta que incluya tomates.	-	FM	test1
Registrar un menú semanal que no incluya pollo como ingrediente.	-	FM	test2
Registrar un receta que incluya pollo como ingrediente.	-	FM	test2
Registrar un receta que incluya berenjenas como ingrediente.	-	FM	test3
Registrar la receta de la tortilla de patatas.	-	FM	test3
Registrar un perfil de comida: le gustan las berenjenas y la tortilla de patatas. Usuario1	-	FM	test3
Registrar un perfil de comida: no le gustan las berenjenas pero le gusta la tortilla de patatas. Usuario2	-	FM	test3
Registrar una agenda semanal: sólo come en casa al mediodía. Usuario1	-	FM	test3
Registrar una agenda semanal: sólo come en casa por la noche. Usuario2	-	FM	test3
Introducir la foto que identifica al técnico. Técnico	-	PCHH	test1

2.4 Otras consideraciones

PREPARACIÓN	ESCENARIO	APLIC.	TEST
Bandeja de tomates etiquetada sobre la encimera.	cocina	FM	test1
Bandeja de pollo etiquetada sobre la encimera. ¡Ojo! con la fecha de caducidad.	cocina	FM	test2
Lavadora apagada.	cocina	AM	test1
Ventilador apagado.	salón	CS	test4
Televisor encendido.	salón	HM	test3
Tag TAG-TA situado sobre la encimera de la cocina.	salón cuarto baño	CS HM	test2 test2
Detector de agua inicializado (sin contacto)	cuarto baño	TAM	test1
La casa a oscuras (luces apagadas y persiana bajada).	casa	CS	test1

3. ESCENARIO CUARTO DE BAÑO

3.1 Escenario

El cuarto de baño es el escenario dónde se van a realizar test correspondientes a las siguientes aplicaciones: Comfort System, Technical Alarms Management y Health Management.

El cuarto de baño está equipado para poder realizar los test de usuario correspondientes a las aplicaciones:

1. Technical Alarms Management (TAM)

   Se han instalado sensores y actuadores de agua.

2. Health Management (HM)

   Se han colocado los dispositivos médicos: báscula, tensiómetro, electrocardiograma, pulsómetro. Además dispone de un espejo que permite visualizar información.

El test correspondiente a la aplicación Comfort System se hace realizando un recorrido por las tres estancias de la casa (cocina, salón y cuarto de baño).

3.2 Test de usuario

3.2.1 Comfort System

Test 1

Este test se realiza recorriendo las tres estancias de la casa.

- María es la primera en llegar a casa por la noche. Toda la casa está a oscuras. Al entrar en la cocina se enciende la luz.

- Decide tomarse una ducha para relajarse. Pero antes se dirige al salón para dejar el correo, la estancia se ilumina.
- Cuando María entra en el cuarto de baño, también se encienden las luces.

3.2.2 Technical Alarms Management

Test 1

- Mientras Jerry está viendo la televisión en el salón, se produce una fuga de agua en el lavavajillas. El TAM detecta la fuga y corta el suministro de agua para evitar una inundación, apaga el electrodoméstico y avisa mediante un mensaje de voz: "¡Alarma! Se ha producido una fuga de agua en el lavavajillas".

  Nota. Durante el test se mantiene abierto el grifo del fregadero para comprobar fácilmente el estado del suministro de agua.

  Se provoca manualmente un contacto en el detector de agua para simular la fuga de agua. Se comprueba que el TAM ha cerrado la válvula principal del agua porque deja de salir agua por el grifo.
- Jerry se dirige a la cocina para revisar la instalación del lavavajillas. Se da cuenta que un tubo está un poco suelto, así que lo sujeta. A continuación, recoge el agua del suelo para que no aparezcan goteras, no quiere tener problemas con los vecinos.

  Nota. Se anula manualmente el contacto en el detector de agua para simular esta situación.
- Cuando la situación que ha provocado la alarma está controlada, Jerry solicita al TAM que restituya el suministro de agua: "Todo arreglado, restituye el suministro de agua".
- El TAM vuelve a abrir la válvula y pone en funcionamiento el lavavajillas.

  Nota. Se comprueba que el TAM ha abierto la válvula principal del agua porque vuelve a salir agua por el grifo.
- Jerry vuelve al salón y continúa viendo la película olvidando rápidamente el incidente ocurrido.

3.2.3 Health Management

Test 1

- Antes de comer, María entra en el cuarto de baño para lavarse las manos. El HM identifica a María.
- Como María lleva dos semanas sin pesarse, el HM mediante un mensaje de voz le indica que sería conveniente que se pesara ahora.
- María decide pesarse, aunque con cierto miedo porque ha comido demasiado turrón en Navidad, y se coloca sobre la báscula. La báscula mide su peso y envía el dato a AMIGO System. AMIGO System registra el dato en el histórico de María.
- El peso de María aparece en el espejo. Afortunadamente ¡solo ha engordado un kilo!.

Test 2

- María llama a Laura desde el cuarto de baño. Laura acude a la llamada y entra en el cuarto de baño. El HM reconoce que ambas están en el cuarto de baño.

- María quiere saber si Laura también ha engordado en Navidad y le sugiere que se pese mientras ella se lava las manos.
- Laura se coloca sobre la báscula. La báscula mide el peso de Laura y envía el dato a AMIGO System.
- El HM reconoce que la persona que se pesa es Laura y no María. AMIGO System registra el dato en el histórico de Laura.
- El peso de Laura aparece en el espejo.

3.3 Guión del test de usuario

APL		GUIÓN	TÉCNICO	TIEMPO
Comfort System test1	1.1	María es la primera en llegar a casa por la noche. Toda la casa está a oscuras. Al entrar en la cocina se enciende la luz.	**Conduce** al grupo a la cocina. **Explica** que el CS al detectar la presencia de una persona en la cocina enciende la luz.	
	1.2	Decide tomarse una ducha para relajarse. Pero antes se dirige al salón para dejar el correo, la estancia se ilumina.	**Conduce** al grupo al salón. **Explica** que el CS al detectar la presencia de una persona en el salón enciende la luz.	
	1.3	Cuando María entra en el cuarto de baño, también se encienden las luces.	**Conduce** al grupo al cuarto de baño. **Explica** que el CS al detectar la presencia de una persona en el cuarto de baño enciende la luz.	
Technical Alarms Management test1	2.1	Mientras Jerry está viendo la televisión en el salón, se produce una fuga de agua en el lavavajillas. El TAM detecta la fuga y corta el suministro de agua para evitar una inundación, apaga el electrodoméstico y avisa mediante un mensaje de voz: "¡Alarma! Se ha producido una fuga de agua en el lavavajillas". Se provoca manualmente un contacto en el detector de agua para simular la fuga de agua. Se comprueba que el TAM ha cerrado la válvula principal del agua porque deja de salir agua por el grifo.	(El grupo ya está situado en el cuarto de baño) **Describe** el escenario al grupo. **Abre** el grifo del lavabo. **Provoca** manualmente un contacto en el detector de agua para simular la fuga de agua. **Explica** que el TAM al detectar la fuga de agua informa de la situación al usuario y cierra la válvula general de paso del agua. Se comprueba porque deja de salir agua por el grifo.	
	2.2	Jerry se dirige a la cocina para revisar la instalación del lavavajillas. Se da cuenta que un tubo está un poco suelto, así que lo sujeta. A continuación, recoge el agua del suelo para que no aparezcan goteras, no quiere tener problemas con los vecinos.	**Anula** manualmente el contacto en el detector de agua para simular que ya no hay fuga de agua.	
	2.3	Cuando la situación que ha provocado la alarma está controlada, Jerry solicita al TAM que restituya el suministro de agua: "Todo arreglado, restituye el suministro de agua". El TAM vuelve a abrir la válvula y pone en funcionamiento el lavavajillas. Jerry vuelve al salón y continúa viendo la película olvidando rápidamente el incidente ocurrido.	**Solicita** en voz alta: "Restituye el suministro de agua". **Explica** que cuando el TAM detecta que ha desaparecido la causa que provocó la alarma y un usuario da autorización, abre la válvula general de paso del agua. Se comprueba porque vuelve a salir agua por el grifo.	

Health Management test1	3.1	Antes de comer, María entra en el cuarto de baño para lavarse las manos. El HM identifica a María. Como María lleva dos semanas sin pesarse, el HM mediante un mensaje de voz le indica que sería conveniente que se pesara ahora.	**Explica** que el HM al reconocer al técnico le recuerda mediante un mensaje voz que debe cumplir su plan de salud.	
	3.2	María decide pesarse, aunque con cierto miedo porque ha comido demasiado turrón en Navidad, y se coloca sobre la báscula. La báscula mide su peso y envía el dato a AMIGO System. AMIGO System registra el dato en el histórico de María.	**Se** coloca sobre la báscula para pesarse.	
	3.3	El peso de María aparece en el espejo. Afortunadamente ¡solo ha engordado un kilo!.	**Explica** que el valor que aparece en el espejo corresponde a la última medida tomada, es decir, al peso.	
Health Management test2	4.1	María llama a Laura desde el cuarto de baño. Laura acude a la llamada y entra en el cuarto de baño. El HM reconoce que ambas están en el cuarto de baño. María quiere saber si Laura también ha engordado en Navidad y le sugiere que se pese mientras ella se lava las manos.	**Pide** al técnico auxiliar que recoja el tag de identificación que está en la cocina y que vuelva al cuarto de baño. **Explica** que el HM reconoce también al técnico auxiliar.	
	4.2	Laura se coloca sobre la báscula. La báscula mide el peso de Laura y envía el dato a AMIGO System. El HM reconoce que la persona que se pesa es Laura y no María. AMIGO System registra el dato en el histórico de Laura.	**Indica** al técnico auxiliar que se coloque sobre la báscula para pesarse. **Explica** que el HM reconoce que la persona que se pesa es el técnico auxiliar y no el técnico porque compara el rango de peso.	
	4.3	El peso de Laura aparece en el espejo.	**Explica** que el valor que aparece en el espejo corresponde a la última medida tomada, es decir, al peso del técnico auxiliar.	

4. ESCENARIO SALÓN

4.1 Escenario

El salón es el escenario dónde se van a realizar test correspondientes a las siguientes aplicaciones: Comfort System, Personal Health Care Center y Health Management.

El salón se ha equipado para poder realizar test de usuario correspondientes a esas tres aplicaciones:

1. Comfort System (CS)

   Se ha instalado un sensor de temperatura, un ventilador y una lámpara que puede emitir luz de diferentes colores. Para simular el comportamiento de la aplicación CS además se necesita:

   - un sensor de temperatura en la cocina
   - dos lámparas, una en el salón y otra en la cocina, para comprobar de forma sencilla como varía la temperatura de la habitación. Las lámparas cambian el color de la luz que emiten para reflejar el nivel de temperatura de la estancia (azul para frío, rojo para calor).

2. Personal Health Care Center (PHCC)

   Aunque el escenario más apropiado para esta aplicación sería el dormitorio, como la casa de demostración no dispone de esta estancia, el test de usuario se realiza en el salón. Se han colocado los dispositivos médicos que componen el PHCC (báscula y tensiómetro) y un tablet-PC para manejar la aplicación.

3. Health Management (HM)

   Dispone de un televisor dónde, además de ver la programación televisiva, se puede visualizar la información de salud. Esa información también se puede visualizar sobre una pantalla que desciende al encender el proyector instalado en el techo de la estancia.

   Se dispone de una PDA para que el usuario pueda interactuar con la aplicación HM.

4.2 Test de usuario

4.2.1 Comfort System

Test 2

- Laura está viendo tranquilamente su serie favorita en el televisor del salón. Transcurrido un tiempo, el CS modifica en el salón la luz a azul (color asignado a Laura) para que la estancia resulte más acogedora para Laura.
- John, el abuelo de Laura, ha decidido visitar a su familia. Entra en casa y se sienta en el salón para conversar con Laura. Al cabo de un rato el CS, como detecta que John permanece en el salón, trata de adecuar las condiciones de luz a la nueva situación. El perfil de confort de John prevalece sobre el de Laura por ser una persona mayor y más delicada, por tanto el CS cambia el color de la luz pasando de azul (color asignado a Laura) a verde (color asignado a John).

Test 3

- Jerry está disfrutando del documental de animales de La2. La iluminación del salón es suave para ver mejor las imágenes del televisor.
- El documental acaba. Jerry apaga el televisor y coge el periódico para echarle un vistazo. Se pone las gafas y pide al CS: “Necesito ambiente de lectura”. El CS aumenta la intensidad de luz de la estancia para que Jerry pueda leer sin dificultad.

Test 4

- Es verano y en la calle hace un calor infernal. A Pablo y a Laura no les apetece pasar calor en la calle y prefieren quedarse en casa viendo una película. El CS detecta que la temperatura del salón es elevada, ya que el sol ha pegado todo el día con gran intensidad.

  Nota. Para conseguir que el sensor de temperatura detecte una subida rápida de temperatura, una persona aproximará su mano al sensor del salón. Para simular el aumento de temperatura en el salón, la luz de la lámpara del salón pasa de azul (frío) a rojo (calor).
- El CS pone en funcionamiento el ventilador del salón para conseguir una temperatura más agradable en esa habitación sin modificar la temperatura de las restantes estancias.

Nota. Para simular la disminución de temperatura en el salón, la lámpara del salón pasa de rojo (calor) a azul (frío). Se comprueba que la temperatura de la cocina no varía ya que la lámpara de esa estancia no modifica el color de la luz que emite.

4.2.2 Personal Health Care Center

Test 1

- Pablo vuelve a casa después del entrenamiento de baloncesto. Después de hacer ejercicio, siempre controla su tensión arterial porque no quiere tener sustos con el corazón.
- Pablo se coloca el tensiómetro en el brazo. En el tablet-PC, va seleccionando las distintas opciones: se identifica pinchando sobre su foto, selecciona como dispositivo el tensiómetro y realiza la medición. El tensiómetro mide la tensión y envía el dato a Amigo System que lo registra en el histórico de Pablo. El PHCC automáticamente muestra la tensión en la pantalla del tablet-PC.
- Antes de que Pablo tenga tiempo para leer el valor en la pantalla, suena el teléfono. Pablo contesta la llamada. Cuando vuelve a colocarse frente al tablet-PC, la información ya ha desaparecido de la pantalla. Pablo selecciona, en el menú del PHCC, la opción para consultar la última medida tomada.

4.2.3 Health Management

Test 3

- Después de un duro día de trabajo, María está sentada cómodamente en el salón viendo la televisión. Aparece un anuncio de un producto dietético que le hace pensar en su hija Laura.
- María está preocupada por la salud de su hija. Decide consultar la evolución del peso de Laura. Mediante la PDA selecciona la opción que le mostrará el histórico de Laura.
- La programación de la televisión se interrumpe momentáneamente para presentar la información que ha consultado María.

4.3 Guión del test de usuario

APL		GUIÓN	TÉCNICO	TIEMPO
	0		**Conduce** al grupo hasta el salón y les describe el escenario.	
Comfort System test2	1.1	Laura está viendo tranquilamente su serie favorita en el salón. Transcurrido un tiempo, el CS cambia en el salón la luz a azul (color asignado a Laura) para que la estancia resulte más acogedora para Laura.	**Indica** que cada usuario tiene asignado un color de luz: azul para el técnico y verde técnico auxiliar. **Sale** de la estancia hacia la cocina y vuelve a entrar en el salón. **Explica** que el CS al detectar la presencia del técnico cambia la luz neutra a azul, color asignado al técnico.	

	1.2	John, el abuelo de Laura, ha decidido visitar a su familia. Entra en casa y se sienta en el salón para conversar con Laura. Al cabo de un rato el CS, como detecta que John permanece en el salón, trata de adecuar las condiciones de luz a la nueva situación. El perfil de confort de John prevalece sobre el de Laura por ser una persona mayor y más delicada, por tanto el CS cambia el color de la luz pasando de azul (color asignado a Laura) a verde (color asignado a John).	**Pide** al técnico auxiliar que recoja el tag de identificación que está en la cocina y que vuelva al salón. **Explica** que el CS al detectar también la presencia del técnico auxiliar cambia la luz de azul (color de técnico) a verde (color de técnico auxiliar) porque el perfil de confort de técnico auxiliar prevalece sobre el del técnico.	
Comfort System test4	2.1	Es verano y en la calle hace un calor infernal. A Pablo y a Laura no les apetece pasar calor en la calle y prefieren quedarse en casa viendo una película. El CS detecta que la temperatura del salón es elevada, ya que el sol ha pegado todo el día con gran intensidad.	**Aproxima** su mano al sensor de temperatura del salón (para conseguir detecte rápidamente un aumento de temperatura) hasta llegar a 30ºC. **Explica** que para simular el aumento de temperatura en el salón, la luz de la lámpara del salón pasa de azul (frío) a rojo (calor).	
	2.2	El CS pone en funcionamiento el ventilador del salón para conseguir una temperatura más agradable en esa habitación sin modificar la temperatura de las restantes estancias.	**Explica** que el CS, al detectar que en el salón hace calor, pone en marcha el ventilador hasta obtener una temperatura adecuada. **Explica** que para simular la disminución de temperatura en el salón, la lámpara pasa de rojo (calor) a azul (frío). **Explica** que el CS no varía la temperatura de la cocina y que se puede comprobar porque la luz de lámpara de la cocina no cambia de color.	
Personal Health Care Center test1	3.1	Pablo vuelve a casa después del entrenamiento de baloncesto. Después de hacer ejercicio, siempre controla su tensión arterial porque no quiere tener sustos con el corazón. Pablo se coloca el tensiómetro en el brazo. En el tablet-PC, va seleccionando las distintas opciones: se identifica pinchando sobre su foto, selecciona como dispositivo el tensiómetro y realiza la medición. El tensiómetro mide la tensión y envía el dato a Amigo System que lo registra en histórico de Pablo. El PHCC automáticamente muestra la tensión en la pantalla del tablet-PC.	**Se** dirige hacia el PHCC. **Se** coloca sobre la báscula. En el tablet-PC: - **Se** identifica pinchando sobre su foto. - **Selecciona** como dispositivo la báscula. - **Selecciona** la opción *Take data.* **Se** pesa. **Explica** que el valor que aparece en la pantalla del tablet-PC es el peso que el PHCC ha registrado en histórico de salud del usuario.	
	3.2	Antes de que Pablo tenga tiempo para leer el valor en la pantalla, suena el teléfono. Pablo contesta la llamada. Cuando vuelve a colocarse frente al tablet-PC, la información ya ha desaparecido de la pantalla. Pablo selecciona, en el menú del PHCC, la opción para consultar la última medida tomada.	En el tablet-PC: - **Selecciona** la opción *Show data*. **Explica** que el valor que aparece en la pantalla del tablet-PC corresponde a la última medida tomada, es decir, al peso.	

Health Management test3	4.1	Después de un duro día de trabajo, María está sentada cómodamente en el salón viendo la televisión. Aparece un anuncio de un producto dietético que le hace pensar en su hija Laura. María está preocupada por la salud de su hija. Decide consultar la evolución del peso de Laura. Mediante la PDA selecciona la opción que le mostrará el histórico de Laura. La programación de la televisión se interrumpe para presentar la información que ha consultado María.	**Se** dirige hacia el televisor. En la PDA : - **Selecciona** la aplicación HM. - **Selecciona** las opciones para mostrar el histórico de salud del técnico. **Explica** que la consulta realizada aparece en el televisor.	
Comfort System test3	5.1	Jerry está disfrutando del documental de animales de La2. La iluminación del salón es suave para ver mejor las imágenes del televisor. El documental acaba. Jerry apaga el televisor y coge el periódico para echarle un vistazo. Se pone las gafas y pide al CS: "Necesito ambiente de lectura". El CS aumenta la intensidad de luz de la estancia para que Jerry pueda leer sin dificultad.	**Solicita** en voz alta: "Necesito ambiente de lectura". **Explica** que el CS aumenta la intensidad de luz de la estancia para que se pueda leer sin dificultad.	

5. ESCENARIO COCINA

5.1 Escenario

La entrada de casa y la cocina son los escenarios dónde se van a realizar test correspondientes a las siguientes aplicaciones: Entrance Manager, Appliances Management y Food Management.

La entrada de casa está equipada para poder realizar el test de usuario correspondiente a la aplicación Entrance Manager:

- Se han instalado dos detectores diferentes para identificar a la persona situada en el exterior de la puerta: identificador de voz con micrófono y reconocedor de cara con cámara.

La cocina se ha equipado para poder realizar test de usuario correspondientes a las aplicaciones:

1. Appliances Management

   Está equipada con los electrodomésticos habituales: vitrocerámica, horno, frigorífico, lavadora, lavavajillas, caldera.

   Se dispone de una PDA para que el usuario pueda interactuar con la aplicación AM.

2. Food Management

   El frigorífico está provisto de un lector de etiquetas para controlar los alimentos que se introducen o se extraen de su interior.

   Además existe un tablet-PC para que el usuario pueda interactuar con la aplicación FM y una pantalla situada en la pared para visualizar la información dada por las distintas aplicaciones.

5.2 Test de usuario

5.2.1 Entrance Manager

Test 1

- Laura llega a su casa tras un duro día de colegio. La casa tiene una puerta inteligente que reconoce a la familia y a sus amigos. Laura mira hacia la cámara situada en la entrada de la casa y espera a que el EM le permita el paso.
- El reconocedor de cara y voz del EM identifica a Laura como habitante de la casa y abre la puerta.
- Al entrar en casa, el EM saluda a Laura mediante un mensaje de voz: “Hola Laura. ¡Qué pronto vuelves a casa hoy!”.
- En la pantalla situada en la cocina, el EM presenta a Laura información personalizada: ha tenido una llamada de su amiga y tiene tres nuevos correos electrónicos.

5.2.2 Food Management

Test 1

- Jerry, como todos los lunes al volver a casa después de su clase de yoga, se dispone a ir al supermercado para realizar la compra semanal. Solicita la lista de la compra al FM mediante el tablet-PC.
- El FM genera automáticamente la lista de la compra y muestra en la pantalla del tablet-PC dos listas, una de productos frescos y otra de productos no perecederos.
- Al repasar la lista, Jerry comprueba que aparecen tomates. Jerry recuerda que la semana pasada dejó una bandeja de tomates fuera del frigorífico para que se maduraran. Entonces introduce los tomates en el frigorífico. El lector de etiquetas del frigorífico registra esta entrada y el FM modifica inmediatamente la lista de productos frescos eliminando los tomates.

Test 2

- María se dispone a hacer la comida y consulta en el tablet-PC el menú semanal confeccionado por el FM qué hay previsto para hoy. El FM sugiere paella.
- Pero el FM detecta que el pollo del frigorífico caducará en dos días. El FM modifica el menú para adaptarlo a las nuevas necesidades cambiando la paella por pollo al curry.

  Nota. Se introduce una bandeja de pollo en el frigorífico para simular esta situación.
- Cuando María abre el frigorífico para sacar los ingredientes de la paella, el FM informa a María mediante un mensaje de voz: “El pollo caduca mañana. He modificado el menú previsto para hoy para incluir el pollo”.
- María consulta nuevamente el menú en el tablet-PC y comprueba que efectivamente el FM ahora sugiere pollo al curry en lugar de paella.

Test 3

- Jerry es el único miembro de la familia que come en casa al mediodía, por tanto el FM siempre propone un menú adecuado a los gustos de Jerry y a la dieta baja en sal que debe seguir. Hoy toca uno de sus platos favoritos: berenjenas rellenas.

- Pablo llama por teléfono para decirle a su padre que esta tarde han suspendido las clases en el colegio y que va a comer en casa. Inmediatamente, Jerry informa al FM mediante el tablet-PC que hay un nuevo comensal.
- El FM informa a Jerry mediante un mensaje de voz que, como a Pablo no le gustan las berenjenas, conviene cambiar el menú.
- Teniendo en cuenta los alimentos disponibles y las preferencias de Jerry y Pablo, el FM modifica el menú previsto para hoy sugiriendo una rica y sana tortilla de patatas.

5.2.3 Appliances Management

Test 1

Aunque este test debería realizarse en el salón, la prueba real se realizará en la cocina para que sea más sencillo comprobar que el electrodoméstico se pone en funcionamiento.

- Pablo está viendo el partido de fútbol tumbado en el sofá del salón. De repente recuerda que su madre le dijo que dejaba la lavadora preparada y que la pusiera en marcha sobre las siete para que cuando ella volviese a casa pudiese tender la ropa.
- A Pablo no le apetece levantarse del sofá para encender la lavadora, coge la PDA y en el menú del AM selecciona la lavadora y la pone en marcha remotamente.
- En la cocina, comprobar que efectivamente la lavadora ha comenzado a funcionar.

5.3 Guión del test de usuario

APL		GUIÓN	TÉCNICO	TIEMPO
Entrnace Manager test1	1.0		**Conduce** al grupo hasta la entrada de la casa y les describe el escenario.	
	1.1	Laura llega a su casa tras un duro día de colegio. La casa tiene una puerta inteligente que reconoce a la familia y a sus amigos. Laura mira hacia la cámara situada en la entrada de la casa y espera a que el EM le permita el paso. El reconocedor de cara y voz del EM identifica a Laura como habitante de la casa y abre la puerta.	**Se** sitúa delante de la cámara para que le reconozca. **Repite** en voz alta el patrón de voz. **Explica** que el EM al reconocer al técnico abre la puerta.	
	1.2	Al entrar en casa, el EM saluda a Laura mediante un mensaje de voz: "Hola Laura. ¡Qué pronto vuelves a casa hoy!".	**Conduce** al grupo al interior de la casa . **Explica** que el EM al reconocer al técnico le saluda de forma personalizada.	
	1.3	En la pantalla situada en la cocina, el EM presenta a Laura información personalizada: ha tenido una llamada de su amiga y tiene tres nuevos correos electrónicos.	**Explica** que el EM al reconocer al técnico visualiza información de forma personalizada.	
Food Management	2.0		**Conduce** al grupo hasta la cocina y les describe el escenario.	
	2.1	Jerry, como todos los lunes al volver a casa después de su clase de yoga, se dispone a ir al supermercado para realizar la compra semanal. Solicita la lista de la compra al FM mediante el tablet-PC.	En el tablet-PC: - **Selecciona** las opciones para generar la lista de compra.	

	2.2	El FM genera automáticamente la lista de la compra y muestra en la pantalla del tablet-PC dos listas, una de productos frescos y otra de productos no perecederos.	**Explica** que el FM genera automáticamente la lista de la compra (una de productos frescos y otra de productos no perecederos) en función del menú semanal y de los alimentos disponibles en casa.	
	2.3	Al repasar la lista, Jerry comprueba que aparecen tomates. Jerry recuerda que la semana pasada dejó una bandeja de tomates fuera del frigorífico para que se maduraran. Entonces introduce los tomates en el frigorífico. El lector de etiquetas del frigorífico registra esta entrada y el FM modifica inmediatamente la lista de productos frescos eliminando los tomates.	**Muestra** al grupo la lista de la compra en la pantalla del tablet-PC, recalcando que incluye tomates. **Introduce** en el frigorífico la bandeja de tomates situada sobre la encimera. **Explica** que el lector de etiquetas del frigorífico registra la entrada de los tomates y el FM modifica inmediatamente la lista de productos frescos eliminando los tomates. **Vuelve** a mostrar al grupo la lista de la compra en la pantalla del tablet-PC, recalcando que ha eliminado los tomates.	
Food Management test3	3.1	Jerry es el único miembro de la familia que come en casa al mediodía, por tanto el FM siempre propone un menú adecuado a los gustos de Jerry y a la dieta baja en sal que debe seguir. Hoy toca uno de sus platos favoritos: berenjenas rellenas.	En el tablet-PC: - **Selecciona** las opciones para consultar el menú semanal. - **Muestra** el menú de hoy recalcando que la receta prevista es berenjenas rellenas. **Explica** que el FM confecciona un menú adecuado para toda la familia para cada día de la semana. Para realizar el menú tiene en cuenta las preferencias (gustos, alergias...) y la agenda (días que come en casa) de cada miembro de la familia. Como al mediodía sólo hay un comensal, únicamente tiene en cuenta sus preferencias.	
	3.2	Pablo llama por teléfono para decirle a su padre que esta tarde han suspendido las clases en el colegio y que va a comer en casa. Rápidamente, Jerry informa al FM mediante el tablet-PC que hay un nuevo comensal.	En el tablet-PC: - **Selecciona** las opciones para consultar el perfil del técnico (no le gustan las berenjanas). - **Muestra** el perfil del técnico recalcando que no le gustan las berenjenas. - **Selecciona** las opciones para indicar que hay un nuevo comensal.	
	3.3	El FM informa a Jerry mediante un mensaje de voz que, como a Pablo no le gustan las berenjenas, conviene cambiar el menú. Teniendo en cuenta los alimentos disponibles y las preferencias de Jerry y Pablo, el FM modifica el menú previsto para hoy sugiriendo una rica y sana tortilla de patatas.	**Explica** que el FM primero verifica si el menú previsto para hoy tiene en cuenta las restricciones (gustos, alergias...) de los comensales. Al comprobar que a uno de ellos no le gustan las berenjenas, cambia el menú teniendo en cuenta los alimentos disponibles y las preferencias de los comensales e informa al usuario. En el tablet-PC: - **Selecciona** las opciones para consultar el menú semanal. - **Vuelve** a mostrar el menú de hoy recalcando que ha sustituido las berenjenas por tortilla de patatas que les gusta a ambos.	

Food Management test2	4.1	María se dispone a hacer la comida y consulta en el tablet-PC el menú semanal confeccionado por el FM qué hay previsto para hoy. El FM sugiere paella.	En el tablet-PC: - **Selecciona** las opciones para consultar el menú semanal. - **Muestra** el menú de hoy. **Explica** que el FM confecciona un menú adecuado para toda la familia para cada día de la semana. Para realizar el menú tiene en cuenta las preferencias (gustos, alergias...) y la agenda (días que come en casa) de cada miembro de la familia.	
	4.2	Pero el FM detecta que el pollo del frigorífico caducará en dos días. El FM modifica el menú para adaptarlo a las nuevas necesidades cambiando la paella por pollo al curry.	**Introduce** en el frigorífico la bandeja de pollo situada sobre la encimera. **Cierra** el frigorífico.	
	4.3	Cuando María abre el frigorífico para sacar los ingredientes de la paella, el FM informa a María mediante un mensaje de voz: "El pollo caduca mañana. He modificado el menú previsto para hoy para incluir el pollo".	**Abre** nuevamente el frigorífico. **Explica** que el FM, al detectar un producto que debe ser consumido porque caduca, cambia el menú para incluir una receta que utilice ese producto.	
	4.4	María consulta nuevamente el menú en el tablet-PC y comprueba que efectivamente el FM ahora sugiere pollo al curry en lugar de paella.	**Vuelve** a mostrar al grupo el menú de hoy en la pantalla del tablet-PC, recalcando que el FM ha modificado el menú incluyendo una receta con pollo.	
Appliances Management test1	5.1	Pablo está viendo el partido de fútbol tumbado en el sofá del salón. De repente recuerda que su madre le dijo que dejaba la lavadora preparada y que la pusiera en marcha sobre las siete para que cuando ella volviese a casa pudiese tender la ropa. A Pablo no le apetece levantarse del sofá para encender la lavadora, coge la PDA y en el menú del AM selecciona la lavadora y la pone en marcha remotamente.	**Explica** que aunque este test debería realizarse en el salón, se realiza en la cocina para que sea más sencillo comprobar que el electrodoméstico se enciende. En la PDA: - **Selecciona** la opción de poner en marcha la lavadora. **Muestra** que la lavadora se pone en marcha.	

6. CUESTIONARIO

Cuestionario - Parte 1: Datos personales

1. ❑ Hombre ❑ Mujer

2. Edad: .....

3. Estado civil

   ❑ soltero/a ❑ casado/a

4. Usualmente ¿durante cuántas horas al día utiliza dispositivos electrónicos en el trabajo?

   ❑ más de 4

- ❑ entre 2 y 4
- ❑ menos de 2

5. ¿Está preocupado/a por llevar un control de su salud (peso, tensión arterial, etc.)?

   ❑ no ❑ si

6. Usualmente ¿cuántas horas al día dedica a realizar las labores del hogar?

   - ❑ más de 4
   - ❑ entre 2 y 4
   - ❑ menos de 2

Cuestionario - Parte 2: Aplicaciones

1. ¿Le gustaría tener esta aplicación en su hogar?

   ❑ no ❑ si

   Por favor incluya una breve explicación:

   .....

   .....

   .....

2. ¿Se encuentra cómodo cuando su casa “le habla” o cuando usted “habla” con su casa?

   ❑ no ❑ si

   Por favor incluya una breve explicación:

   .....

   .....

   .....

3. ¿Opina que en todo momento ha tenido el control sobre la aplicación?

   ❑ no ❑ si

   Por favor incluya una breve explicación:

   .....

   .....

   .....

4. ¿Considera que la aplicación mantiene la seguridad y privacidad de los datos?

   ❑ no ❑ si

   Por favor incluya una breve explicación:

   .....

   .....

.....

5. ¿Piensa que la interacción con la aplicación (voz, PDA, tablet-PC) resulta sencilla?

VOZ	❑	complicado	❑	relativamente sencillo	❑	muy sencillo
PDA	❑	complicado	❑	relativamente sencillo	❑	muy sencillo
TABLET-PC	❑	complicado	❑	relativamente sencillo	❑	muy sencillo

Por favor incluya una breve explicación:

.....

.....

.....

6. ¿Cree que la información que proporciona la aplicación es suficiente?

❑ insuficiente ❑ falta información ❑ suficiente

7. Si considera que la información no es suficiente ¿qué información adicional le gustaría que proporcionara la aplicación?

.....

.....

.....

8. Desde su punto de vista, para mejorar la aplicación ¿qué añadiría/eliminaría/ modificaría?

.....

.....

.....

6 Appendices Activity Sharing

6.1 Appendix A: Pre-Test Questionnaire

Demographic Information

1. What is your gender? M / F

2. What is your age?

3. What is your nationality?

4. Living arrangements: (circle one)

    a. Live alone

    b. Live with a roommate or significant other

5. Do you have any children living in your home? If so, how many, and what are their ages?

6. What is your occupation?

Technological Use

1. Do you ever watch TV programs together with other members of your family? Yes / No (if no, then go to Question 8)
2. With whom do you watch these programs?
3. And, approximately how many hours per day do you spend in this activity together?
4. Which of these applications do you use? Please be specific (circle all that apply.)
    a. None
    b. MSN
    c. MSN video chat
    d. GoogleTalk
    e. Skype
    f. ICQ
    g. Other (please specify): _____
5. Do you belong any of the following social online communities (circle all that apply.)
    a. MSN
    b. Facebook
    c. MySpace
    d. Hyves
    e. Other (please specify): _____
6. If you have a digital camera, do you upload pictures to your computer with the intent of sharing them with friends or family? Yes / No
7. If yes, what applications or websites do you use for sharing pictures ?
    a. Email
    b. Flickr
    c. Kodak Gallery
    d. Shutterfly.com
    e. Picasa
    f. Other (please specify): _____

8. Do you ever play games with others online (i.e., over a network)?

   Yes / No

9. If yes, how often?
   a. Yearly
   b. Monthly
   c. Weekly
   d. Daily

10. Do you use a mobile phone to do things other than simply make calls, such as (Circle all that apply):
    a. I only use my mobile phone for calls
    b. SMS
    c. Taking photos
    d. Recording video
    e. Online games
    f. Other (please specify): _____

Pre-Interview

1.Please tell what kind of devices you used in your home environment last week and for how long?

For instance, TV, mobile phone, computer, webcam, digital camera, game console.

Did you experience any problems with these devices?

6.2 Appendix B: Data collection sheet

		Needing/ Asking for Help	Positive Behaviors	Negative Behaviors	Failure(s)	Success(es) (Was the task completed successfully?)
Task 1 Upload Pix	Verbal					
	Non-Verbal					
Task 1 -Comments						
Task 2 Connect to Friend	Verbal					
	Non-Verbal					
Task 2 -Comments						
Task 3 Share Album	Verbal					
	Non-Verbal					
Task 3 -Comments						

		Needing/ Asking for Help	Positive Behaviors	Negative Behaviors	Failure(s)	Success(es) (Was the task completed successfully?)
Task 4 Receive Invite	Verbal					
	Non-Verbal					
Task 4 -Comments						
Task 5 Play Quiz Game	Verbal					
	Non-Verbal					
Task 5 -Comments						

6.3 Appendix C: Post-test interview rubric

Structured conversation:

1. What did you like most about the system, and why?
2. What did you like least about the system, and why?
3. Probes: What problems did you come across while interacting with the system? Which steps in the tasks did you find most difficult?
4. Follow-up questions to probes: Why do you think that these problems arose?
5. Probes: What did you find easy to use about the system?
6. What is your opinion of the sharing pictures feature?
7. What is your opinion of doing activities such as playing games and sharing pictures on the television?
8. Did you enjoy interacting with someone in a remote location during the game?
9. What do you think of a system that automatically senses your presence and adapts dynamically to your preferences?
10. How does this system compare to the way that you usually communicate with others, and what is the main difference, from your viewpoint?
11. Do you think that this system provides an improvement over your current means of communicating with others?
12. Do you think that the external devices (Icat, light etc.) added to the experience of playing the game? Why or why not?
13. Would you like to be able to connect the different devices together in your own home (similar to the way in which they were integrated in the test)? If so, for what purpose?
14. Did you enjoy using the remote control as an input device? Why or why not? Could you think of another devices
15. Are there things you would like to change about the interface? If so, what would you change and why?
16. Would you like to have such a system connection devices in your own living room?
18. What would you tell about this experience to your best friend.

6.4 Appendix D: Pre-test interview results

Results of pre-test interview

Demographic information						Watching TV		
Gender	Age	Nationality	Living	Children	Occupation	Watch TV	with hom?	How many hours?
F-7/14	26	NL-12/14	ALONE-3/14	No-13/14	STUDENT-8/14	No-2/14	FAMILY-12/13	AVERAGE-0.85hours
M-7/14		Turkish-2/14	TOGETHER-11/14	Yes-1/14	EMPLOYEE-6/14	Yes-10/14	ALONE-1/13	NO-0

Use of applications							Social online communities				
None	MSN	MSN Video chat	GoogleTalk	Skype	ICQ	Other	MSN	Facebook	MySpace	Hyves	Other
0	12/12	1/12	2/12	6/12	0	1/12	6/12	2/12	0	9/12	1/12

Sharing pictures							Online gaming				
Share pictures	Email	Flickr	Kodak Gallery	Shutterfly	Picasa	Other	Gaming	yearly	monthly	weekly	daily
Yes-10/10	10/12	3/12	0	0	0	3/14	Yes-3/14	0	2/14	2/14	0
							No-11/14				

Use of mobile phone						Devices used in home environment last week	Any problems with devices
only calls	sms	taking photos	recording video	online games	other		
0	14/14	4/14	2/14	0	EMAIL-1/14	TV-12/14-about 9hours OTHER(computer, mobile)-2/14-about 11hours	NO-8/14 Yes-TV 2,computer 2,mobile 3, remote control 1

Data from pre-test interview

			Demographic information						Watching TV		
Test	ID	Name	Gender	Age	Nationality	Living	Children	Occupation	Watch TV	with hom?	How many hours?
1	1	Erik	M	19	NL	Together	No	Student	Yes	Mother	1
	2	Olga	F	21	NL	Together	No	Student	Yes	Roommates	Max 1
2	3	Maurice	M	27	NL	alone	No	Phd-Student	No	x	x
	4	Mark	M	27	NL	alone	No	Phd-Student	Yes	Family	once a week

3	5	Lieke	F	24	NL	Together	No	Phd-Student	Yes	Friends & family	0.5
	6	Sandra	F	25	NL	Together	No	Phd-Student	Yes	Boyfriend	0.5
4	7	Mia	F	34	NL	Together	No	Manager	Yes	Partner	0.5
	8	Lucille	F	39	NL	Together	Yes (1, 5y)	Secretary	Yes	Child	0.5
5	9	Sibrecht	F	24	NL	Together	No	Student	Yes	Friends & family	1
	10	Stijn	M	23	NL	Together	No	Student	Yes	Roommates	1
6	11	Jannekе	F	23	NL	Together (studenthouse)	No	Student	Yes	Friends & family	0.5
	12	Adriaan	M	23	NL	Together (studenthouse)	No	Student	Yes	Friends & family	1
7	13	Murat	M	23	Turkish	Together	No	Student	Yes	little brother	0.5
	14	Odnar	M	23	Turkish	alone	No	Student	No		

	Use of applications							Social online communities				
ID	None	MSN	MSN Video chat	GoogleTalk	Skype	ICQ	Other	MSN	Facebook	MySpace	Hyves	Other
1												Party block
2							Hyves					
3	??	?	?	?	?	?	?	??	??	?	?	?
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14	?	?	?	?	?	?	?	?	?	?	?	?

	Sharing pictures							Online gaming				
ID	Share pictures	Email	Flickr	Kodak Gallery	Shutterfly	Picasa	Other	Gaming	yearly	monthly	weekly	daily
1	Yes						Hyves Chat (MSN)	Yes				
2	Yes							No				
3	?	?	?	?	?	?	?	No				
4	Yes							No				
5	Yes,							No				

	sometimes											
6	No							No				
7	Yes						Facebook	No				
8	Yes							No				
9	Yes							No				
10	Yes							Yes				
11	Yes							No				
12	Yes							No				
13							Deviant	Yes				
14	?	?	?	?	?	?	?	Yes				

Use of mobile phone						
ID	only calls	sms	taking photos	recording video	online games	other
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						e-mail
14						

ID	**Devices used in home environment last week**
1	TV for 8 hours, mobile phone 2000 sms and if going out take pictures with it, computer more than 6 hours a day,
2	TV for 2 hours, mobile phone 4 hours, Computer: 40 hours
3	TV for 4 hours, mobile phone 5 hours, computer 5 hours
4	TV for 5 hours, moble phone 2 hours, computer 30 hours
5	TV for 7 hours, mobile phone 40 min, computer 2 hours
6	TV for 5 hours, mobile phone 1 hour
7	TV for 6 hours, mobile phone 1 hours, laptop 3 hours, digital camera 10 min
8	TV for 10 hours, mobile phone 1.5 hour, computer 10 hours, radio 1 hour
9	TV: 10 hours DVD, cable 1 hour, tv on internet 2 hours, webcam 30 min., mobile phone 3 hours, digital camera 1 hour
10	TV for 15 hours, mobile phone for 2 hours, computer for 10 hours
11	TV for 10 hours, mobile phone for 2 hours
12	TV for 10 hours, mobile phone for 1 hour, computer 30 hours, digital camera for 0.5 hour
13	Computer, Xbox360, digicam, webccam
14	Mobile phone 30 min, computer 30 hours, webcam 2 hours

ID	**Any problems with devices**
1	I want a tv with a better sound system. My mobile phone is slow (Nokia N80)
2	Computer: Internet did not work, mobile phone: network provider kicked me off
3	No

4	No
5	Yes, the remote control broke down
6	No
7	No
8	No
9	Computer crash, bad phone reception
10	low battery (mobile phone)
11	No
12	No
13	Sometimes with my computer
14	Everything is smooth...Let's see what you have

6.5 Appendix E: Post-test interview results

1. What did you like most about the system, and why?

Description	Participant ID
Love games	1, 2, 12
Like the idea behind it	1
Quiz is funny	1
Likes to operation with these kind of system	1
Picture sharing	1, 8
Many options → Lots of possibilities	2
You own friends	2
Cool to interact with other people	3, 7, 8, 11, 12,13
Liked the iCat the most because: funny, real physical interaction with the cat and impossible to hear what he says	4
iCat	5, 8
That you could connect with other people to do various things	6
Had a lot of fun	7
Feels intuitive	7
It is an "all in one" system for different digital activities, and that is cool	9
Inviting and interacting with someone somewhere else while watching tv is a nice feature	10

2. What did you like least about the system, and why?

Description	Participant ID
The need of the operation	1
Not clear about how the system operate	1
Do not see added value of system	1
Do not like the visuals	1
Doubts about usability for elderly	1
Unclear navigation	2, 9
Not good color, yellow is sometimes more orange.	2
Really slow reaction time of the navigation through the menu	3,4
Frustrated at crashes	5
Remote control: had to press too slowly for it to work and sometimes it was not clear which button to press	6

The bugs in the system, system does not function really good	7, 13
Bad audio while interacting with others	7
Prototype	8
No feedback about what the other teem sees and hears	9
The structure of the menu	10
red, green, blue buttons not convenient to look at	10
iCat (left-right)	11, 12
Difficult to know what is in which menu	11

3. Probes: What problems did you come across while interacting with the system? Which steps in the tasks did you find most difficult?

Description	**Participant ID**
Was impatient, because sometimes it took long	1, 8
No visual/verbal feedback of output of the system, is there a connection?	1, 7
Unclear categories in system Example: game	1,12
Misses the link between left and right side of screen	1
The system crashes many times	2, 3, 7
Adding a help button or options in the system user interface	2
Poker game is not in the game category	2
Pictures are not in the shared folder yet	2
In beginning it was difficult to share pictures because it was not clear; out of sync the picture snow & what he was doing	3
What do the others see? Ambiguous interface	4, 9
Quiz: which question for which team and how to react on the questions?	4
Finding Nina	4
Remote control: improper indication of button affordances	5, 6
No tasks were difficult	6
Remote control: was not always working, slow response	8, 9
Difficulties with stopping the poker game	9
Navigation, lost track of where she was in the system	9
iCat, left-right was difficult to understand	11, 12
Sharing pictures: what does the other group see?	11
In the picture folder no possiblity to go to share	13
Mix right button and OK	13

4. Follow-up questions to probes: Why do you think that these problems arose?

Description	**Participant ID**
Can be a result of the order of the scenarios	1
slow response time of the system operation (no immediate response)	1,9
Not optimal yet	2

You have to get used to the interface	4
Need a good and clear guide for how to use it	4
First prototype	7,8
Lots of bugs	7
Has NOTHING to do with usability	7
Descriptions of categories are not always clear, misses a main menu	9
Not intuitive	9
Not every option is clear and visible	9
mismatch between viewpoint of engineer and end-user	12

5. Probes: What did you find easy to use about the system?

Description	**Participant ID**
Colors (Yellow, red, green, blue), good mapping of color on remote control	1, 8, 9, 11
Up, down, left, right are clear for navigation, but a long list to scroll	1, 2, 8, 11
Generally easy to figure out menu structure, intuitive	3,6
Logging in was really intuitive	4
Uploading the pictures via USB (system reacts automatically)	4
Navigation in picture menu	7
Lack of consistency in navigation (first to game, then to friend. While this order was different with the picture sharing	7
Participant did not remember	9
Interface felt intuitive	12
working with the remote control	12
You can use the regular remote you do not need another one	13

6. What is your opinion of the sharing pictures feature?

Description	**Participant ID**
Funny, I really like that	1, 2
Unclear how to make it operate	1, 3
Loves the idea of talking about the picture	1
Would like to see the immediately reaction of others	1
Little bit difficult: not able to see what the other team sees	1,3, 4
Better than msn	5
Not something I would do, but it was easy	6
Great! really fun to do it over the television, real-time communication is fantastic	7
Nice, it is not necessary to start up a pc	8
Is really fun (uses this a lot in skype)	9
Enjoyed that you could share pictures but it was poorly structured. It was a bit confusing because you did not know what you could see, did you look at the same picture?	10
good idea	11

Has no added value, is more fun when you are physically together (in the same room)	12
Confusing, better to send the whole album so that they can browse themselves	13

7. What is your opinion of doing activities such as playing games and sharing pictures on the television?

Description	**Participant ID**
Has doubts between the system or a normal pc	1
A lot of features need to be added: - Watching television need to be easy and quick - Gallery creating for pictures, music - Checking email is an really good idea	1
Luxury, I can not do with my laptop	2
It is okay, depends on the game. But because you can do this also via the internet it is not an advantage	3
This will be the future	4
Why doing it on the tv?	5
If a tv can do the same things as a computer it would be okay	6
I does not like playing games, but the setting in a living room is more relaxed and feels more natural	7
Picture sharing is nice, gaming not really relevant for me but maybe if someone invites me	8
Good idea: pc is more professional, but living room setting is more relaxed	9
It was fine but the use of a remote control is too constraining	10
sharing picture = nice playing game = low threshold	11
For games it is a good idea, has doubts about picture sharing	12
I prefer Xbox, but for family this is better	13

8. Did you enjoy interacting with someone in a remote location during the game?

Description	**Participant ID**
Missed the options of seeing the others during the game	1
Did not notice the cards on the photo frame during game	1
Really difficult to have a good idea of what the others see and hear	1
Nice to do it with your own friends	2
Yes! Liked the feed of the webcam	4
More fun than a simple phonecall	4
Audio was good	4
It was strangers for me. It would maybe nicer if you knew them	5
It is a nice feature, but might not use it herself	6
It is really funny and exciting, I would love to have such a kind of system	7
Nice to look for new friends	8
Yes, but is more fun with people I really know	9

Yes	10
Sometimes it is not clear if there is a connection or not, I would use it only for people I would know	11
Nice concept, looks like skype, it has to be easy and accessible, it has added value	12
I really like, only people we know	13

9. What do you think of a system that automatically senses your presence and adapts dynamically to your preferences?

Description	**Participant ID**
Love the idea	1
Love these kind of system and gadgets	1
Must not get intimidating	1
You must not notice it all the time; it has to be there and has to function property	1
Have doubts about privacy, you should have a choice. No automatically log in as being online	1, 3, 4, 7, 8, 9, 2, 10
When it starts automatically you keep on playing with it	2
For simple things like tuning on lights it is okay.	3
Good concept	4
Wants to be in control of the system	4, 9,12
Wants to have the possibility to give some hind of command to activate a certain adaptation	4
Could be nice, must have manual	5
No, she thinks it is a bit strange, sounds like for the future	6
Adaptation to preferences sounds great	7
Nice, connect light and heating if your enter the room	8
Who gets priority if there are two persons in the room?	10
I do not like, sent invitations by myself	11
Good idea, would like to have it. Makes life more easy	12
Very good idea, race recognition (maybe better than RFID)	13

10. How does this system compare to the way that you usually communicate with others, and what is the main difference, from your viewpoint?

Description	**Participant ID**
This does not use text (there has to be a keyboard then)	1
Speech input also difficult; other people will not probably like it when you are talking to the system all the time	1
Quite similar, but nice put in the living room	2
It is quite the same to msn because you can make a phone conversation and play games. But the advantage of this system is that everything is integrated	3
This system can replace all other applications: it is an all in one product	4, 7
Large difference, normally just telephone & direct contact	5
Quite similar to MSN	6

Seems much more easy than using different applications	7
Saves time because of the all in one concept	7
Immediate accessible	8
More extensive	8
Easy use of remote control (did no text-input)	8
This system could replace the telephone	9
Can take over a part of the entertainment which I normally use on my PC	9
Video/audio communication over internet is not really natural.. chat programs	10
It is more personal and more accessible	11
This is an all in one system that can be used in the living room	12
It is needed that everybody has it	13

11. Do you think that this system provides an improvement over your current means of communicating with others?

Description	**Participant ID**
Currently a laptop or pc is more easy and more fast	1
Living room idea seems more relaxing	1, 9
If you add "internet", you will have a real PC	2
Integration of all devices	3
Yes, because it is an all in one system	1, 4, 9
She would only use it when she is bored. Probably use it sporadically, not every day	5
No, except that there is a lot of integration with different devices	6
Yes, it is now only ONE system you have to turn on. Saves time	7
/	8
Not really, it is not different enough but it is nice that you do not have to sit behind your computer to communicate	10
Differs for the situations: - neighbours, I would use it instead of real contact (negative) - friends/familiy who are far away (positive)	11
Yes, integrating is a good idea	12
If you can integrate more devices in the house that would be very nice	13

12. Do you think that the external devices (iCat, light etc.) added to the experience of playing the game? Why or why not?

Description	**Participant ID**
Do not like the iCat that much	1
iCat is not stylish, and way too big	1
Depends on interaction style	1
Can be fun and make me happy	1
Can in a way be extracting when it is too much	1
Yes, especially for children.	2

I expected to see the pictures one by one on the photo frame uploading	2
Did not notice the light and the photoframe. The Icat was funny (but left vs right problem) does not need make game more fun thing	3
No, no added value (only funny)	4
It is funny but it was not much for the quiz game. Did not understand what the lamp was for.	5
No did not do much for her	6
These devices have only added value for gaming	7
The iCat is disturbing because it talks and makes a lot of noise	7
iCat is funny, but the iCat and other group were talking at the same time therefore difficult to understand both	8
Loves the iCat, would like that she can see what he says to the other team	9
Lamp is cool because it can emphasize the atmosphere during a game	9
Did not see the connection between the light and the tv.	10
Switching between the devices is difficult	10
iCat is funny but not necessary	11
The light is more functional, you can see immediately if friends are online	11
No, likes only things to focus on. Other things can be distracting and annoying	12
ambilight, not really a big added value	13

13. Would you like to be able to connect the different devices together in your own home (similar to the way in which they were integrated in the test)? If so, for what purpose?

Description	**Participant ID**
Yes, but has to be easy to implement and wireless	1
Yes, cooker, and use the light to indicate that you do not forget the cooker while watching TV	2
No, because it is not necessary	3
If it protects my privacy and I can control it myself, Yes	4
Needs to be wireless	4, 9
With practical appliances, only to make things easier	5
No, you would not want to use it in the near future	6
Yes, primarily for the network possibilities and the interaction possibilities with friends, maybe also useful for business activities	7
Yes, for heating, curtains, lights, cooking devices, coffee machine	8
Yes, perhaps. But the problem is that all things must connect to the system. The question is: Is FULL interconnection between devices possible	10
music, functional devices (lights, curtains, heating) all controllable by one TV	11
Yes the all in one concept, the integration is good	12
lamps, heating, curtains, garage	13

14. Did you enjoy using the remote control as an input device? Why or why not? Could you think of another devices

Description	Participant ID
Fits using the television	1
Doubt about mouse (fit to PC)and keyboard	1
Doubt about game controller (Do not fit the setting)	1
You used to use a mouse as pointing device -Small - Easy to type text	2
Yes, because you are already familiar with it. For improvement: maybe touch screen because intuitive	3
Yes, it is intuitive	4
Maybe voice, touchpad/-screen, wireless mouse, or something like the Xbox 360 controller	4
Yes; but mouse/keyboard is better	5
No, it had missing buttons	6
Easy and natural, everybody is familiar with the remote	7
Easy, only use of few buttons	8
For navigation the menu it is okay, but for playing games it would be difficult than the remote has to be "all in one".	9, 10
Clear and useful (arrow keys and multitab)	11
Works fine, but games need to be simple for this kind of device.	
You could use a iPod kind of remote(scrolling wheel)	12
No good feedback (vibration, light)	13
Not good buttons	13
4 color buttons (color blind)	13

15. Are there things you would like to change about the interface? If so, what would you change and why?

Description	Participant ID
Left and right	1
Categories	1
Colors are not the same each time	1
Maybe pointing device	2
Scroll bar	2
You do not use “ok” button	2
Go back… go through all the menus ->Missing ”Home” button	2
Help button	2
Large size “webcam”	2
No	3
No	4
Make it clear what the user should do – whose turn?	5
The remote control, but the graphics are okay	6
Consistency is really important	7
Loves the idea of personalization (choosing themes, colors, and options for example).	7

Make webcam screen adaptable in size and place it somewhere else	8
More feedback when navigating	9
Slides between left menu and right menu is really unclear (maybe use transition)	9
Personalizable could be fun	9, 10
Would prefer more a pc interface than a dvd interface,	10
Sober design	11
One pop-up window showed behind a picture	11
Maybe more breadscrumbs for navigation	12
The interface looks clean and simple which is good, use of basic colors is good	12
Similar to X-box	13
Better organize	13

16. Would you like to have such a system connection devices in your own living room?

Description	**Participant ID**
/	1
Nice, I want to have it private	2
No, because it is not necessary	3
Yes, but wants to be able to fully control the system	4
ONLY if everybody has it	5
No	6
/	7
Yes, IF other friends and family use such a system	8
/	9
Perhaps, but does not like having to buy everything from one brand	10
Depends on the price and more people have to have it already (so that always someone is online)	11
/	12
If the price difference with a normal TV is not too big	13

17. What would you tell about this experience to your best friend.

Description	**ID**
Saw a television that can do a lot more the only watching TV and deliver more interaction	1
Funny, nice concept with a lot of possibilities	2
I did experiment a remote control, television, played games and shared photos	3
The iCat, because he is really funny	4
The iCat was cool, but the prototype MUST be improved	5
It was funny to do, but maybe not your thing	6
Communicating with friends via a television is fun. Working together with Lucille was also fun.	7
Laughed a lot. Participating in a user's test: sharing gaming and being videotaped	8
The living room experience	9

Gives you a DVD experience but with more. Like watching a DVD with more options	10
System that you can communicate. Very easily sharing pictures and the iCat was very funny	11
the iCat, but in a negative way	12
They are building a X-box live which is more simple but it is still primitive	13