

AAL Joint Program




Connected Vitality, the Personal Telepresence Network (CVN)



D7.1 A document with the results of the Spanish field test

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Document history

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Due to an official project extension provided by the AAL that concerned all project partners, the initial delivery for the pilot operation in Spain (month 26) was delayed following a later deployment of the pilot itself, so the results and analysis were done after the initial proposed date as described in this deliverable.

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1. Introduction

The following document deals with the results of the field studies that took place in Spain over a period of six weeks (end of May until beginning of July 2013). The central goal of the field study was to *evaluate the YoooM in a “natural” setting*, offering potential end users the opportunity to try out the device at their homes. According to the proposal, the central focus was on “Care”, thus we were interested in participants’ experiences when using the YoooM to be in contact with their formal and informal (family) care givers. In the following we will outline the central scope within the study, the setup and central results. This deliverable only provides an overview on the central results. More detailed information can be found within the internal report.

1.1. The Organization (EUOs)

ASSDA is a Non-profit organization stemming from the Andalusian Regional Government (Junta de Andalusia). ASSDA was founded in October 2000, and provides social and care services in Andalusia, including the application of new technologies to social services, the promotion and development of transnational initiatives, family support, prevention and training.

The Agency provides a wide range of social services and support actions to the Region of Andalusia, like the Andalusian Telecare Service, which currently has over 178,000 members. This is one of the biggest telecare services in Europe with two telecare centers located in Seville and Malaga, covering the Eastern Andalusia and Western Andalusia respectively.

The Agency counts with more than 1000 workers and as part of the ongoing research and improvement of services, it participates in different European projects and programmes for the improvement of the services delivered like in the case of the CVN project.

The profile of the people to whom ASSDA provides service to are distributed into different categories:

- **Persons aged over 65, who:**
 - Have an Andalusian government “sesentaycinco” Card.
 - Have the necessary psychological and physical conditions.
 - In the case of the requesting party, for those who suffer from Alzheimer’s disease or any other aged-related dementia, the possibility of use will refer to the person responsible for their care.

- Have at their disposition a land telephone line (not a mobile phone).
- **Persons with a disability who**
 - Are aged between 16 and 65.
 - Have a disability or handicap of 65% or over.
 - Are on the voting roll of any municipality in Andalusia.
 - Have at their disposition a land telephone line (not a mobile phone).
- **Persons in dependent situations**
 - The service is assigned through their Individual Attention Programme (PIA)

The most common way of the organization to interact with its users is by regular calls. Automatic calls are established, when clients press the panic button; in this case they are automatically connected with the call centre.

On the other hand, the Agency has regular contact with day and night care centers where elderly and dependent people go do activities and socialise.

Most of the calls received at the call center are due to people suffering from social isolation and loneliness, which rises a lot the concern for implementing new systems and devices that could improve their situation.

The Yoom device represents open new possibilities for the daily monitoring and contact of the users with family, relatives and carers, enhancing the presence feeling, and facilitating the interaction when mobility restrictions exist.

Thus, in the future, with better economic juncture, with a more modern prototype, lightweight and without failures, the YooM device could support participants to get in contact with their formal and informal care givers and thus support social inclusion or support care by e.g., allowing check ups with clients' doctors via the Yoom devices.

2. Study design

The YoooM system was evaluated on the basis of various values, defined in the concept of ViA [Fuchsberger et al. 2012] which is based on the theory of consumption values (TCV). The idea behind it is to focus on the user perspective, taking into account emotions and experiences, but also includes technological aspects such as the usability of the system. Thus, ViA covers a wide range of factors of Usability (U), User Experiences (UX) and User Acceptance (UA) within one concept. According to the TCV we focused on the investigation of the *interpersonal value* (social presence, social connectedness, reciprocity), the *functional value* (reliability, usability, sociability, ease of use, usefulness) and the *emotional value* (fun/enjoyment, computer anxiety of the YoooM system. Moreover, we gathered information about participants' *social context* (e.g., with whom they are in regular contact, to what extent they feel incorporated in their social network) (for a more detailed description of the study designs see D6.2).

2.1. Research Questions (PLUS)

According to the values, and the main focus “care”, the following central research questions were defined:

Interpersonal value

RQ1: To what extent do participants experience *social presence* when communicating via the YoooM device with their family and care giver(s)?

RQ1.1: To what extent does participants' social presence change over time?

RQ2: To what extent do participants experience *social connectedness* when communicating via the YoooM device with their family and care giver(s)?

RQ3: What characterizes the communication in terms of reciprocity?

Functional Value

RQ4: How do participants evaluate the *usability* of the YoooM system (effectiveness, efficiency, satisfaction)?

RQ5: To what extent do participants experience the YoooM as *easy to use*?

RQ6: How do participants estimate the *usefulness* of the system in order to be in contact with their care giver?

RQ6.1: To what extent do participants experience to be supported in terms of care?

RQ6.2: Which different areas of home care are conducted via the YoooM system?

Emotional Value

RQ7: To what extent does the Yooom evoke *fun/enjoyment*?

RQ8: What did participants like/dislike when using the Meet format in order to be in contact with their family and care giver(s)?

RQ9: To what extent does the Yooom evoke *computer anxiety*?

Social Context

RQ10: What characterizes participants' social network in general?

RQ11: How does the communication with the care giver look like?

RQ11.1: To what extent are participants satisfied with the communication with their care giver?

2.2. Methodological Approach (PLUS; EUOs)

Within the field trial a variety of different methods were applied, e.g., interviews, a diary and workshops. The following paragraph provides a brief overview on the approach. A detailed methodological description can be found in the internal concept for the field trials as well as in D6.2.

At the beginning of the study, Assda carried out *workshops* in order to introduce participants to the procedure, e.g., what kind of materials they were asked to use, whom they can turn to in case they have questions. Although the participants were informed about the activities they could carry out via the Yooom they were *not* introduced in detail about the handling and how the device worked. The usage of the Yooom should be self-exploratory, and participants should independently get going with the device. Thus, we did not intervene in this process. At the workshops, appointments were made for the *installation of the units* and the *pre-interview* at the older adults' homes. The pre-interviews aimed at gathering information about participants' social background and their needs in terms of care.

After all units had been installed, participants started at the same time with the *six-week-field trial*. To gain information during the six weeks, participants were asked to *use a diary* to write down their experiences when using the device. The diary included open questions and structured questionnaires in order to assess users' experiences with respect to e.g., social presence or usability. All questionnaires were self-reporting questionnaires, consisting of items to be rated on a five-point-scale and participants were asked to indicate to what extent they agreed to the given statements. In order to gain a better overview on the findings, we

only report if participants agreed, disagreed to the given statements or chose the category neither nor.

Additionally to the diary participants got a calendar where they could write down their appointments via the YooM (e.g., when they would meet in the Classroom or in the Club in order to play some games). It included also some notes that should remind them to carry out certain activities or to fill out a questionnaire in the diary. During the field trial, participants of the study were in regular contact with their home service provider.

At the end of the trial, the units were de-installed and a *short interview* was carried out in order to discuss the materials that were used during the study and to gain information about participants' experiences.

Recruitment of participants (EUOs)

ASSDA contacted older adults from the Day Center (Perchel Day Center), and selected those who were interested to participate in the CVN project pilot. Moreover, it was necessary that a relative participated in the pilot. ASSDA recruited two users from the day care center with their respective informal carers who were willing to contribute and participate in the pilot.

The other two older adults and their relatives were obtained from a selection made in the Telecare Service. These are users who have participated in other European projects pilots.

Description of participants

The participants were already familiar with New Technologies and able to interact with devices similar to YooM, understanding the basics of its functioning.

All of the older users were over 65 years of age while the informal carers were ranging from 28 to 40 years of age.

Among the entire groups of participants, only two of them know each other while the other ones are interested in the possibility to increase contact within their family circle.

2.3. Technical Support (BME, Presence)

The general organizational plan for the field test is presented in [1]. As mentioned here, in the field test environment PRE, as the first level help desk made the major changes in the system when needed. It needs to be mentioned that at the start of the field test at ASSDA the project was having several improvements based on the experiences from SENSIRE and ARVIKA. To solve the additional problems because of the environmental change (new internet providers, new users), the second help desk was used and for ASSDA, BME was organizing it. To ensure the proper connection and fine-tuning of the devices and system, a remote access application was needed to be installed on the Yooms, to get a platform, which makes it possible to repair the clients directly.

The Technical support was organized through the ASSDA technical team and PRE. If problems occurred as a first step the technical experts from ASSDA (most of the problems were solved by this step) tried to solve the problems by themselves. If something could not be solved locally, then PRE, as the first helpdesk was called, who processed the problem and translated it to the technical contact at BME.

Technical support results

In the following section we provide the results of the field test related to the technical support. First, we provide a general overview of the technical conditions of ASSDA. Then, we present the technical problems observed during the field test at ASSDA and the way they were tackled. The description of the problems and solutions are organized in three subsections: Solved issues, Instabilities, Open issues, and Suggestions. Finally, we present the conclusions derived from the field test from a technical perspective.

General overview

ASSDA is located in the area of Malaga. This city is at the southeastern of Spain. In general the infrastructure and Internet connections are good for testing the system. As we mentioned before, this field test was the last in the row of the field tests (after SENSIRE and ARVIKA).

The results and improvements from the previous experiences were all included in the system and shipped to ASSDA, Spain.

For the field test, it was a challenge for EUOs to find end-users who fit the profile of the Persona “Anna” (see D1.1) and match the network requirements defined by the technical partners. The download speed at the registered users was over 5 Mbps (which fits the CVN

requirements and it is also the average in Spain). The average upload speed of the network connection is small but enough for the sound and video streaming communication needed for CVN network. During the field test a fine-tuning of the system operation was needed to provide a usable sound and video quality.

In Table 1 we present the Internet speed of the end-users in the field test as well as the user-machine association and the location of the units.

Yoom Unit	YoomUser	Location	DL Speed (Mbps)	UL Speed (Mbps)
Y2	autotest2a	end-user: Ana M.	19,03	0,91
Y4	autotest8a	end-user: Salva D.	12,33	1,09
Y5	autotest3a	end-user: Mayka	11,40	0,90
Y6	autotest4a	end-user: Manuel M.	6,56	0,67
Y8	autotest6a	end-user: Nuria V.	8,56	0,70
Y9	autotest7a	end-user: Manuel L.	5,65	0,81
Y10	autotest7	end-user: Maruja R	19,06	0,92
Y12	autotest1a	end-user: Francisco R.	6,88	0,42
Y17	autotest9a	ASSDA HQ: Fernando R.	6,20	0,42

Table 1 User-machine association and Internet speed at ASSDA field test

Observed problems

In Appendix I., we have included all the results of the issues and details of the field tests. In the following sub-section we present a summary of the results.

Solved issues

- Club activities:
 - **Problem:** The messages from the Club activities were overloading the server application. The messages were late from the clients to each other. There were some differences between the messages of the games and news and excursion.
 - § **Solution:** For the optimal processing of the Club messages we had to divide the server process into two parts. The news and excursion server were improved with movement flow tracking function. In the server application was always stored the actual status of the system.

- Video and sound problems:
 - **Problem:** The sound was lagging and faltering during the game and Club activities. The game starting was instable.
 1. **Solutions:** A delay of a few seconds was included between the Club activity loading and the video streaming. The problem is solved.
 - **Problem:** The sound was lagging and chopping during teach and club activities.
 2. **Solution:** This issue was caused by two reasons. One of them was the slow internet uplink connection. In this case the user experts were realizing that the sound is more important in telepresence feeling, than the video quality. The main problem module in the system was caused by the FreeSwitch. FreeSwitch is the converter and processor module in the system. It needs more bandwidth for transmitting the audio. This sound processor module also needed some important environment setup step.


The other reason was the Virtual Private Networking used in the system. During the field test in Arvika the VPN was used for all of the network traffic channel (because the Internet Service Provides security shaping of the users traffic). After the Yoom devices has been moved to Malaga, the VPN setting remained as it was before in Arvika. Because of the different ISP, different security rules, different networking connection parameters, with VPN used as it was in Spain, several problems arisen. Therefore, the settings in VPN routing needed to be changed, to make a differentiation between the channels and traffic types going through the VPN.

Open issues

- Sound problems were experienced with BBB in Club and teach. The problems were addressed by UCY but in the amount of time of the field test, it was not possible to fix

it completely. Users with low Internet connection (DL speed lower than 1Mbps) still experienced problems with halting and chopping sound during the field test.

- In the BBB system, used for audio and video of Club and Classroom, it was not possible to detect when the camera was not properly initialized (due to the hardware problem discussed above). As a result, the user had to leave and re-join the clubs/classrooms to fix this problem.

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3. Results (PLUS)

The following part of the document provides the central results of the field trial that was carried out in Spain. More detailed information can be found within the internal reports.

All participants were recruited to the profile of the Persona “Anna” that has been developed based on the data from the requirements analysis within WP1 (see D1.1), meeting the following characteristics: older than 70 years, (slightly) restricted in mobility, needs and/or receives help in terms of care, willingness to participate in social life, basic computer skills and interest in new communication technologies.

Overall four participants and their relatives took part in the field trial in Spain. They were all recruited according to the profile of Anna and were aged between 67 and 71 years (one missing) (average: 69). Two of them are married, two widowed, all of them are retired and two are additionally doing voluntary work. One is restricted in mobility, three not, and one needs help regarding the activities of daily living. All of them indicated that they can go out without the help from others and all of them have got basic computer skills.

3.1. Social Context

In order to gain more information about participants’ social context in general, an interview at the beginning of the field trial was carried out to find out with whom they are in regular contact, what kind of communication channels (e.g., technologies) they use in order to stay in contact and to what extent they experience being part of a group of people. Moreover, with a focus on the care aspect participants were interviewed about how they normally stay in contact with their care giver and to what extent they are satisfied with the communication.

RQ10 What characterizes participants’ social network in general?

All of them indicated that they are in regular contact with their family, two of them with friends and one participant pointed out that s/he has got quite a good connection to the neighbors. There are no specific activities they carry out with people they regularly meet. They for example go for a walk or have lunch together. Two participants regularly go to the day care center where a variety of different activities are offered.

All of the participants consider technologies as quite important because they improve quality of life (2), and can be crucial in case of an emergency (1). One participant pointed out that s/he uses technologies in order to avoid staying behind. All of them are using different kinds of communication possibilities, e.g., Skype, Twitter, Whatsapp, Messenger. One participant

only uses the land line and the mobile phone.

All of them indicated that there are people they can count on help regarding activities of daily living and all of them have a close relationship to family members such as the partner or the children and indicated that they would turn to family members when they had worries or important decisions to take.

In case of an emergency, they would turn either to neighbors (1), family members (2) or the care giver (1). One participant was not sure to whom s/he could turn to, but finally thought that neighbors would help in case of an emergency. Only one participant indicated that there are other people who rely on him/her for his/her help (which is a neighbor) and two participants regularly do voluntary work. With respect to the subjective experience of connectedness, all participants said that they feel well connected and also feel part of a group of people who share the same interests. Two participants feel connected to people of the day care center, one to a gymnastic group and one feels incorporated in his/her group of neighbors. All of them normally stay in contact with those people face-to-face and only use the phone (mobile or landline) to stay in touch with them.

With respect to the degree of connectedness, one participant indicated a value of 10 and all other three participants a value of 8. Thus, we can conclude that all participants of the field trial feel socially connected.

RQ11 How does the communication with the care giver look like & RQ11.1 How satisfied are participants with the communication?

As mentioned in the beginning only one participant regularly needs support regarding the activities of daily living. All participants were in regular contact with a responsible person from the care organization.

3.2. Interpersonal Value

RQ1: To what extent do participants experience social presence when communicating via the YooM device with their family and care giver(s)?

In order to assess participants' experience of social presence when communicating via the YooM device a questionnaire was used that consists of ten items to be rated on a five point likert scale, asking participants to indicate to what extent they agree to the given statements. Social presence was assessed at the beginning of the field trial in week 1 and at the end of the trial in week 6.

Additionally to the information that was gathered through the diary, participants were interviewed after the six week field trial and were asked if they had an experience of actually talking to a person face-to-face and if they felt closeness when using the YooM and if it made a difference in comparison to other communication technologies they have used so far (e.g., mobile phone, the iPad).

Within the first week the overall mean for social presence was 4.25 (SD=0.31), indicating that participants mainly agreed to the given statements, meaning that they experienced social presence when communicating via the device. At the end of the field trial the mean was slightly higher (M=4.3, SD=0.39). Having a more detailed look on the data we can see that participants agreement to the different statements was almost the same in week 1 and week 6 (see

Figure 1)

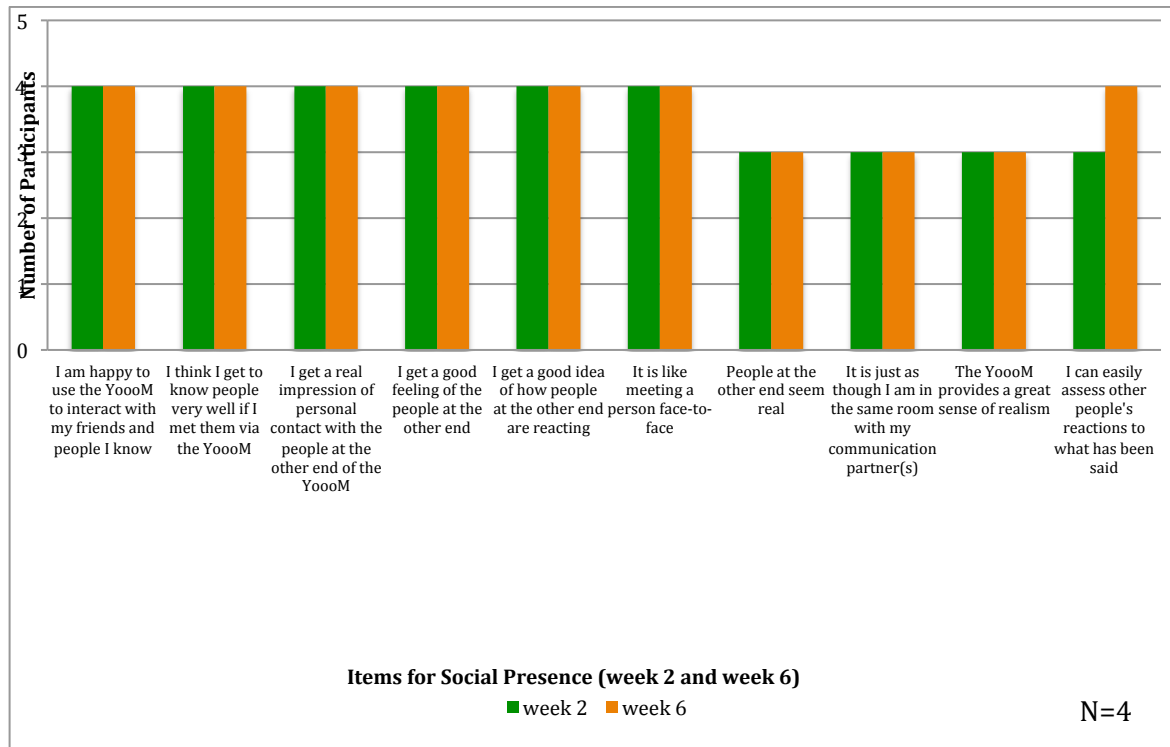


Figure 1: Items for Social Presence

Within the post interview participants were asked to indicate if they experienced actually talking to a person face-to-face when using the YoooM in comparison to other technologies they had used so far.

It was mentioned that the YoooM *is superior* to other media, especially due to the *big size* (2) of the screens. Moreover, almost all participants (3) indicated that the feeling of being in the same room was very *real* although the *video quality was sometimes worse* (2). Especially, that one could *see the gestures of other people and the facial expressions*, contributed to their experience of talking to a person face-to-face. One person stated: *“I had a great feeling of closeness, especially in the Meet Format.”*

Nevertheless, they also recognized that the device was quite big in comparison to the technologies they regularly use, such as the mobile phone, which was considered as being *more usable* (2) and *very simple* (1), pointing out that the advantage is that one *can take it along* (3).

Besides, participants were asked if they experienced closeness when using the device. Two participants explicitly pointed out that they *had a great feeling of closeness*, because of the *big size of the screens* (2) making it possible to *see gestures* (1). One participant for example mentioned that it was an advantage when communicating because the grandchildren could also see what s/he had in her hands. All of the participants pointed out that *seeing the context*

(the place where the communication partner was sitting) contributed to their experience of closeness.

RQ2: To what extent do participants experience social connectedness when communicating via the YooM with their family and care giver(s)?

In order to investigate to what extent participants experienced social connectedness when using different communication technologies they were asked to write down their experiences during the field trial (week 1-5). Post it's were placed next to the communication technologies they regularly use (e.g., the mobile phone, the PC) and at the end of the day they were asked to place them into the diary.

To get a more holistic picture on participants' usage of different devices, related to their experience of connectedness, the following paragraphs outlines the structured according to the different participants.

Participant 1

The participant pointed out that the **land line** does not provide any sense of closeness to him/her and that s/he experiences it as a kind of traditional communication method, without human proximity and that it is quite impersonal. In week 4 the participant pointed out that s/he *had to use* the device quite a lot because the YooM did not work properly.

Regarding the mobile phone, s/he experiences it as a good communication system because one can use it every time but that s/he does not experience any kind of closeness.

The participant also regularly uses **Skype** and likes it because it gives a feeling of closeness, which is important when talking with family members living abroad. S/he appreciates that one can see one's communication partner, share documents, videos or photos but points out that Skype does not provide the same closeness as the YooM.

With respect to the usage of the **YooM** the participant points out that it provides a greater sense of closeness than Skype and although there were some problems from the beginning s/he points out that s/he likes the experience to be in the same room with one's communication partners. Although this participant also experienced a variety of different technical problems s/he enjoyed the meeting with more people, pointing out that “... *I felt like meeting in the same room, despite the errors.*”

Participant 2

The participant pointed out that s/he uses the **land line** quite often but it does not provide the

same sense of closeness than the YooM provides and that s/he experience it as a kind of *traditional method of communication*. Nevertheless, s/he prefers the mobile phone. Although the participant experienced a variety of technical problems from the beginning, s/he won't use the land line if s/he had all her contacts on the YooM because s/he likes the sense of closeness s/he experiences when the YooM works well. In week 3 the participant stated that the land line was very important for him/her during the week because the YooM did not work properly. Then s/he explicitly pointed out that s/he experiences that the land line is quite impersonal. In one week during the six week field trial the participant was on vacation and when s/he came back s/he had a lot of missed calls and realized that s/he missed this functionality on the YooM device.

Regarding the **mobile phone**, the participant pointed out that it is his/her preferred media, because it is not very expensive and s/he knows how to use it well. S/he regularly uses the mobile phone but does not experience any sense of closeness comparable to the YooM.

With respect to the **YooM** the participant already pointed out in the first week that s/he had very good impressions although there were several technical problems and that s/he liked it because it seems that s/he was in the same room with his/her communication partners. Only in week 2 the participant reported about his/her sense of closeness. During the following weeks s/he only reported about the variety of technical problems and if it worked well or not but did not provide any information about his/her sense of closeness anymore.

Participant 3:

Participant three used the land line, the mobile phone and the YooM during the field trial. The **land line** was hardly used because the participant experienced it as much more comfortable to use the mobile phone than the land line. S/he only used it once when communicating with family members who are living abroad. S/he experienced it as much more practical to use the **mobile phone**, but pointed out in week 5 that it does not provide the same sense of closeness than the YooM although it is very important in his/her life. S/he appreciates that she can carry it around and use it at any place.

The participant pointed out that s/he likes to use the **YooM** because it is similar to the phone, easy to use and although there were some technical problems (the speakers failed occasionally), in week 3 the participant said that the YooM has already replaced the land line when talking with his/her son and that s/he would appreciate if more people in his/her family would have such a device.

Participant 4

The participant experiences the **land line** as traditional method for communication and regularly uses it to talk with family members or even the care giver. S/he experiences the land line as traditional tool for communication but did not talk about his/her experience of closeness when using the device.

The participant rarely uses the **mobile phone** because it is very expensive for him/her and s/he had similar experiences as when communicating via the land line. What s/he misses was the opportunity to *see* one's communication partner.

Regarding the **YoooM** the participant pointed out that s/he had a lot of technical problems throughout the whole field trial, e.g. with the speakers. Only in week three the participant stated that the sense of closeness was very good and that s/he liked it.

Summing up, all four participants were using different communication technologies but experience a special sense of closeness when using the YoooM. Nevertheless, the variety of technical problems was always prominent, which might have had an influence on their experience of connectedness.

RQ3: What characterizes the communication in terms of reciprocity?

Data logging was done during the six week field trial in order to assess to what extent participants were active via the YoooM (with whom, how long, etc.) Unfortunately, due to the variety of technical problems, the logging data does not provide any information about participants' frequency of use but provides information about the connection problems and we cannot draw any conclusions about their natural usage of the system.

Summary: Interpersonal value

Although there were a variety of technical problems, we gained insights about participants' experience of social presence when using the device and what their experience of connectedness in comparison to other devices was. All participants experienced social presence and appreciated the big screen that made it possible to see gestures, to show things to one's communication partner and to recognize facial expressions.

Moreover, all participants appreciated the feeling of being connected to others, which was partly associated with "being in the same room". One participant, who regularly uses Skype indicated that s/he felt more connected when using the YoooM.

3.3. Functional Value

RQ4: How do participants evaluate the usability of the YooM system (effectiveness, efficiency, satisfaction)?

This research question is answered by analyzing the SUS-questionnaire that was filled out by the participants in the first as well as sixth week of the field study. Normally, an overall SUS score would be calculated, but due to the small amount of data the items were analyzed separately.

In the first week, three participants agreed that they *would like to use the YooM frequently*, one participant neither agreed nor disagreed. None of them *find the YooM unnecessarily complex* and *think that the YooM is easy to use*. Three participants indicated that they disagree that they *would need the support of a technical person to be able to use the YooM*, one person indicated “neither nor”. All of them said that *the functions of the YooM are well integrated and* three persons indicated that there is *too much inconsistency*, one person indicated “neither nor”.

All of them indicated that they *could imagine that most people would learn to use the YooM very quickly* and that they *feel very confident using the YooM*. Three indicated to disagree that they *would need to learn a lot of things before they could get going with the YooM* one person indicated “neither nor” and all of them disagreed that the *YooM is very cumbersome to use*.

In comparison to week 1 where only three participants indicated that they *would like to use the YooM frequently* in week 6 at the end of the field trial all participants indicated that they would like to use the YooM frequently. Nevertheless, one participant agreed that s/he *thinks that the YooM is unnecessarily complex* (within the first week all disagreed to the statement). All of the participants agree that the *YooM is easy to use*. All participants disagreed that *they would need support of a technical person to be able to use the YooM*. Three participants stated that *the functions of the YooM are well integrated*, one participant indicated “neither nor”.

Regarding the statement *I think there is too much inconsistency when using the YooM* only one person disagreed, two stated to neither agree nor disagree and one person agreed.

Nevertheless, all participants agreed that *they can imagine that most people would learn to use the YooM very quickly* and *feel confident using the YooM* and all disagreed to the statement *I would need to learn a lot of things before I could get going with the YooM*.

RQ5: To what extent do participants experience the YooM as easy to use?

Ease of use was again evaluated by means of a questionnaire that was included in the diary in week 2 and week 6, asking them to indicate their agreement/disagreement to six given statements.

Within week 2 all participants agreed that they *find the YooM easy to use* and that *learning how to operate the YooM was easy* for them. Two participants agreed that *it is easy to get the YooM to do what I want it to do*, that *the YooM is flexible to interact with* and that *the interaction with the YooM is clear and understandable*. Two participants neither agreed nor disagreed to the given statements. Finally, two participants stated that *it was easy to become skillful at using the YooM*; one participant disagreed and one participant indicated to neither agree nor disagree (see Figure 2).

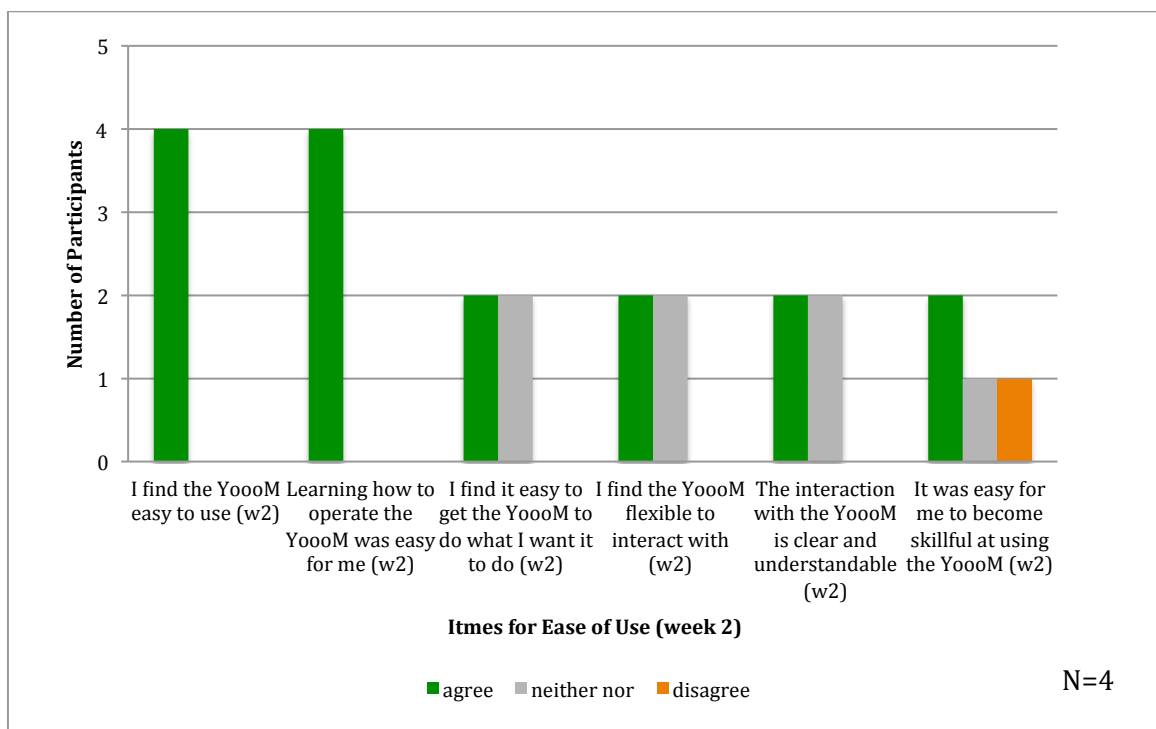


Figure 2: Items for Ease of Use - degree of agreement (week 2)

Within week 6, all participants again agreed that they *find the YooM easy to use* and that *learning how to operate the YooM was easy* for them. Moreover, all participants stated that *it is easy to get the YooM to do what they want it to do*. Three participants agreed that the *interaction with the YooM was clear and understandable* and that they find the YooM *flexible to interact with*. Two participants neither agreed nor disagreed to the given statements. Only two participants said that it was *easy to become skillful at using the YooM*,

one person disagreed and one person indicated neither nor (see Figure 3). Summing up, based on the data we can conclude that participants’ considered the system as useful and that their experience slightly increased over time.

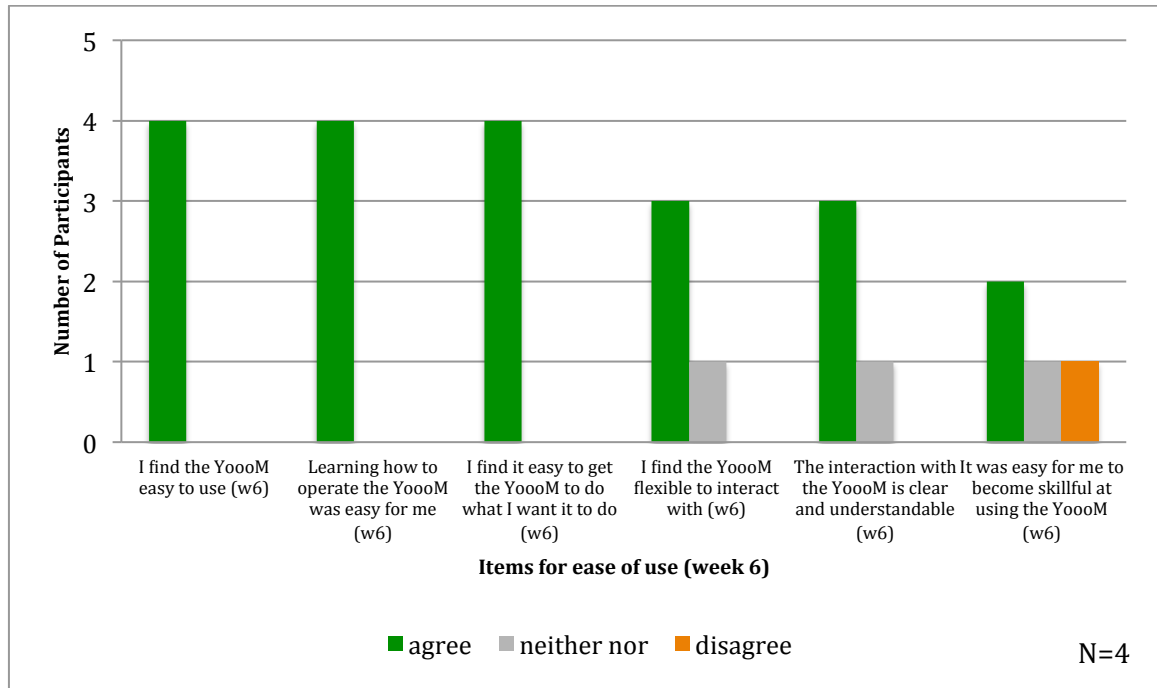


Figure 3: items for Ease of Use - degree of agreement (week 6)

RQ6: How do participants estimate the usefulness of the system in order to be in contact with their care giver?

Usefulness was assessed within the diary (week 2 and 6) and within the interview at the end of the field trial.

In week 2, three participants said that the *Yooom is useful* and that it is *beneficial to use the Yooom*. One participant indicated to neither agree nor disagree to the give statements. Two participants agreed to the statement *I think the Yooom can assist me in conducting activities with other people* and two participants neither agreed nor disagreed to the given statements.

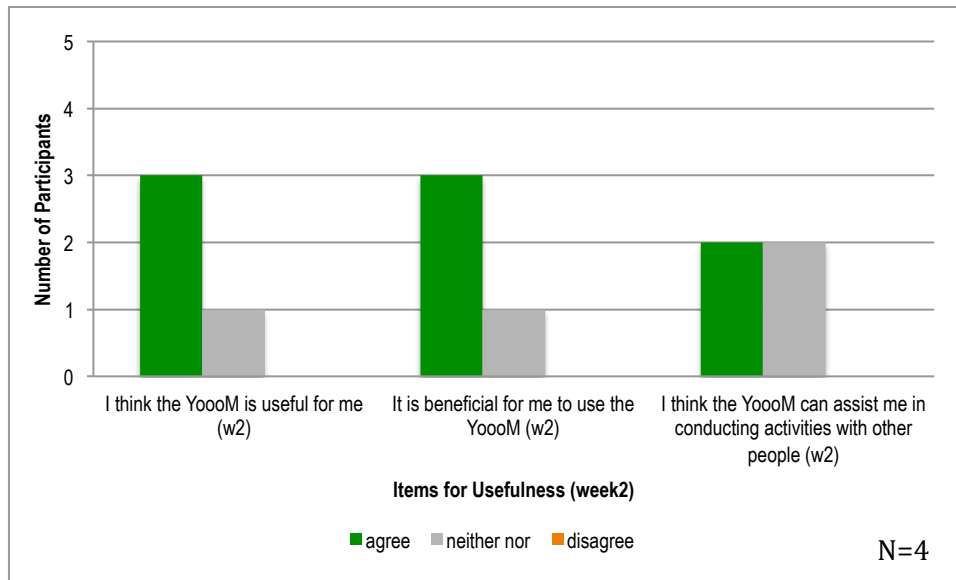


Figure 4: Items for usefulness – degree of agreement week 2

At the end of the field trial, in week 6, all participants agreed to the statements *I think the YooM is useful for me* and *It is beneficial for me to use the YooM*. Three participants agreed to the statement *The YooM can assist me in conducting activities with other people*. One participant neither agreed nor disagreed to the statement. Summing up, participants considered the system as useful and their experience increased over time.



Figure 5: items for Usefulness - degree of agreement (week6)

Summary: Functional Value

Summing up, although participants experienced a variety of different technical problems, the data indicates that the YooM provides functional value. In general, participants considered the device as easy to use and that it is beneficial for them to use it.

3.4. Emotional Value

The emotional value with respect to the usage of the YooM was assessed by three theoretical constructs: fun/enjoyment, likes/dislikes and computer anxiety. Fun and enjoyment was assessed within the diary by means of a Smiley Scale, asking participants to indicate to what extent they enjoyed communicating with their family and care giver via the YooM (participants could choose between five different smileys – two positive, two negative and one neutral smiley). Additionally, participants were asked to write down likes and dislikes when communicating with their family and care giver and they were interviewed at the end of the field trial. Finally, computer anxiety was assessed by means of three items to be rated on a five-point likert scale.

RQ7: To what extent does the YooM evoke fun/enjoyment?

Fun and enjoyment was assessed within the diary (week 1,3,5), asking participants to indicate their degree of fun/enjoyment on a “Smiley Scale” (ranging from 1-5 – 1=did not enjoy at all, 5=totally enjoy). Besides they were asked within the post-interview to indicate what they especially enjoyed when using the device.

Concerning the **communication with the family**, in week 1 all participants chose the happiest smiley (5), in week 3, three participants chose the happiest smiley (5) and one the second happiest smiley (4) and at the end of the field trial two participants chose the happiest smiley and two the second happiest smiley. Overall, we can state that for two participants the experience of fun/enjoyment decreased over time, which could be explained by the variety of technical problems that occurred.

With respect to the **communication with the care giver**, in week 1, two participants chose the happiest smiley (5) and two the second happiest smiley (4), in week 3, three chose the happiest smiley (5) and one the second happiest smiley (4) and finally in week 5 at the end of the field trial two participants again chose the happiest smiley (5), one the second happiest smiley (4) and one did not select any smiley at all.

According to the data that was gathered through the interviews at the end of the field trial we found out that it was **fun** (2) and **interesting** (1) for participants to communicate via the YooM. One participant pointed out that s/he enjoyed the social relationship one could “generate”. Nevertheless they did not enjoy that the **games and applications were very limited** (2).

Three of the participants especially enjoyed **communicating via the Meet format** because it

provides the *greatest sense of closeness* (2). One participant pointed out that s/he really enjoyed that she could show his/her work to others and explain something.

When asking the participants to provide three examples of what they especially enjoyed when using the Classroom and Club format, two participants said that they enjoyed playing *Ludo*, one participant had fun to play Bubbles and one PingPong. One person pointed out that s/he enjoyed playing games in general.

RQ8: What did the participants like/dislike when using the Meet format in order to be in contact with their family and care givers?

Within the interview at the end of the six-week field trial participants were asked to indicate what they liked or disliked when being in contact with their care giver and/or their family.

Regarding the **communication with the family** almost all of the participants (3) pointed out that they like to *see their grandchildren or children*, that there was the possibility to *play games together* (2) and to *interact with each other* (3), e.g. reading the newspaper together with others. Moreover, one participant each mentioned again the *closeness* s/he experienced when communicating via the YooM.

All of them disliked that there were connection problems and two of them mentioned that they did not like that the video quality was low. According to the dislikes that were identified, participants suggested to solve the connection problems, to improve the video quality (1) and to provide an opportunity to be in contact with more than 4 people at the same time (1).

With respect to the **communication with the care giver** it has to be considered that none of the participants regularly receive support in terms of care. Nevertheless, participants were asked if they could imagine to be in contact with their care giver in the future and to indicate where they see benefits.

Three participants find it interesting to use the YooM to be in contact with the care giver because s/he could check the situation in real time, could support the clients (4), e.g., by asking if they had already taken their medication and to prevent emergency situations.

Two of them said that this could be the future of telecare but one participant also mentioned that the device needs to be cheaper and that it needs to be improved.

RQ9: To what extent does the YooM evoke computer anxiety?

Within week 2 of the field trial all participants agreed that *the YooM does not scare them at all*. Three participants agreed to the statement *the YooM does not make me feel*

uncomfortable, one participant disagreed to the statement. Two participants indicated that *the YooM does not make them nervous*, one participant disagreed and one indicated neither nor. In week 6 of the field trial again all participants agreed that *the YooM does not scare them at all* and that the *YooM does not make me feel uncomfortable*. Three participants said that *the YooM dose not make them nervous* one participant disagreed to the given statement. Summing up, participants anxiety decreased over time, meaning that fewer participants stated that working with the device does make them feel uncomfortable or nervous than in the beginning.

Summary: Emotional Value

Regarding the emotional value, we can conclude that the YooM arose positive as well as negative emotions. Positive, because a variety of participants experienced fun and enjoyed playing games with either the family or the care giver. But a lot of negative experiences arose because of the variety of technical problems that occurred throughout the six week field trial.

3.5. Additional Insights

Besides, participants were asked how much they enjoyed working with the diary, if they had any suggestions for improvements or additional comments. These findings are outlined in the following.

Working with the diary

At the end of the field trial participants were also asked to indicate what they liked when working with the diary, what they disliked and if they had problems.

Three participants indicated that they liked working with the diary because it was easy and comfortable. Only one participant pointed out that s/he did not like filling out the questionnaires, but that her family and the care giver supported him/her to do all the reporting. But it was not because of the diary itself but more that s/he did not like documentations in general.

Regarding the likes, two participants especially liked that there was space to write “freely” about their experiences and thoughts and enjoyed working with post it’s.

None of them had suggestions for improvements.

4. Conclusion

Summing up, based on the data we can conclude that the system provided interpersonal value for all participants, as they experienced a high level of social presence and felt connected when communication via the YoooM.

With respect to the functional value, it has to be considered that there were a lot of technical problems that influenced participants' experience of the usability of the device. In general, participants agreed that it is useful and that the YoooM could assist them in conducting activities with other people.

Regarding the emotional value, the data illustrates that the YoooM arose positive as well as negative emotions. Positive, because a variety of participants experienced fun and enjoyed playing games with either the family or the care giver and enjoyed that one could see the communication partner almost life-sized. But a lot of negative experiences arose because of the variety of technical problems that occurred throughout the six week field trial.

From the data we gained from the trial we can conclude that the YoooM *has potential* to provide interpersonal, functional as well as emotional value for the target group (considering that we cannot generalize the results). Nevertheless, there are a lot of technical issues that need to be addressed such as improving picture and sound quality or the quality of the games (making them more challenging).

4.1. Strengths and Pitfalls

The pilot of YoooM devices has been very positive for users and also for the professionals at ASSDA when interacting with them. The feedback has been constant, continuously informing us about their concerns over pilot. We have tried to answer all their questions and sometimes we have raised interesting questions to them.

There were some errors occurring in the devices along the pilot but users were patient and they understood it. At all times they were aware that it was a pilot. There were two users who were very pleased to use the YoooM with family and other two others who used it with their families and with the moderator in the office. In general, there was a very fluid cooperation and a willingness from the users side which was very worthy and helpful when it came to draw conclusions.

The following are the main strengths and faults observed during the pilot:

Strengths

- All users were happy with the ability to see relatives in large size.
- If users were participatory, they loved to do meetings, lectures, play games, etc.
- The first impression of all users was very positive.
- For them, the device (with many improvements) was the future of social services at a distance.
- It was very intuitive, so it was a good way to introduce older people in the world of new technologies.
- It was an interesting way to socialize people into groups. There were many single people who could have similar interests.
- It might be interesting to use the software, because the device was expensive, but the software was very intuitive for users who were not very familiarised with the new technologies.

Pitfalls

- There were significant errors during the pilot.
- Few entertainment possibilities.
- Slow response when playing games
- Device too heavy and large.
- It is very necessary that the device has "missed calls".
- Actually it was very expensive.
- Too many accessories/complements sticking out of the device (cameras, speakers).
- It would be good to use the device as a normal computer

This field test at ASSDA was the last of the three trials that were carried out. Some of the suggestions and recommendations from the previous field tests were included to the system.

During the testing time, the users could use and experience and improved system as a result of the other field tests carried out in Arvika and Sensire. At the start of the testing phase the network and communication experienced some problems which were solved during the pilot phase. . The users could feel the telepresence and could make real reviews from the functions of the CVN system. The time and the user number during the test were not really enough to check all of the parameters of the system. Some additional tests would be welcomed. There are some minor issues is the system which should be eliminated before the solution can go the market as pointed out above, . All of the tests and studies would be really good base for a future project in this topic.

5. References

[1] CVN deliverables D6.2. A process guideline document for the field tests

6. Appendix I

6.1. Solved issues

Yoomm Unit	Problem	Reported date/time	Status	Problem description	Solution
X	After idle period users go offline and they become online the UI does not refresh it	29.04.2013	Fixed	After idle period the users who go offline and then come back online are not refreshed. The problem seems to be caused when YS disconnects a user. And it seems to be present since the version in which I separated a different vector for the friend list for UI and for controller. Maybe the presence is being updated in the controller friend list, but not in the UI	YoommRTC sw was modified by PRE to update UI
X	The units go offline and do not reconnect automatically	23.05.2013	Fixed	"The unit loses connection with the server and is not able to reconnect. In the YoommServer console the unit is not online. The unit has to be restarted to have it connected because it is stucked in the reconnection window and the timer does not come. The unit was still online via teamviewer."	Watchdog timer added by PRE to software to close it if 5 minutes have passed without connection. The network modules were modified too to avoid waiting forever when there is no answer from server after disconnection. The software will try ten times and if no response it will restart connection.

6.2. Instabilities

Yoom Unit	Place	Problem	Problem description	Solution
Y9	HQ	"Going out of ""news"" the software got frozen and i had to restart the unit. Version 1.2.11.12 Y9, it happened once although i didn't try it again, I was in news for about 20 seconds then tried to go back and it froze."	One-time-problem	
X	HQ and end-users	News does not sync always	Sometimes the news format does not sync well. The users have experienced that they get back to the initial page, even after visiting some other links. It was observed in a session with Fernando (Y17); he was with two other users: Llaneras (Y9) and Manolo (Y6). All of them returned to the initial page. After this there was not any further problem.	The user is able to overcome this problem
X	HQ and end-users	Excursion does not sync always	Fernando (Y17); he was with two other users: Llaneras (Y9) and Manolo (Y6). They had the problem that excursion does not sync always all of them. They were trying to focus on Malaga, one of them were not redirected. He was seeing the map of Budapest. Fernando told him to click sync. Note: When somebody clicks on sync the user will be synchronized with the info in the server. This was observed a couple of times. They were using for one hour all the formats, including news, excursion, and games. Therefore around 10 to 15 min using excursion it happened couple of times the problem. The user was able solve it.	The user is able to overcome this problem

Yooom Unit	Place	Problem	Problem description	Solution
Y17, Y2	HQ and end-user home	Flash security settings still popup when starting clubs or teach	There are a couple of users which still need authorization in flash. Even after setting the configuration in flash. Sometimes happens when Windows restarts. One unit is Y17 (in the office), the other unit is Y2 (Ana). Somehow Y2 loose the setting. Lorant is looking into Y17 and Omar into Y2.	Lorant has changed settings of Internet explorer. Omar changed the same setting in Y2. - Disable all to lowest and disable protected mode - Advanced/Security/Empty temporary files - Noting on the antivirus.
Y5	end-user	Camera initialization problem	"Y5 sometimes has problem with initialization of the cameras. It happens once when the unit was installed, when into news or Clubs, one of the cameras did not initialize. The user has called him that it happens again couple of times. This happened once in meet but the user stopped the called and tried again (the sw is able to detect this problem after 20 sec, but the user close the connection before) Note: The user will change the ISP to upgrade the internet connection."	The user is able to overcome this problem
X	end-user & HQ	BBB stopped working. Some changes were made in the server which broke the system. THIS PROBLEM WAS QUICLY FIXED BY BME AND UCY in 2 hours, however it was reported 3 hours later	The problem might have occurred due to the changes made on Friday. An IE cache clear might have needed, or something else was changed. The problem was solved by UCY and BME two hours after it was reported. Assumption is that Club and teach stopped working. the problem appeared because the tomcat server of the BBB server has been subjected to some changes by accident, like it rolled over to a previous state overwriting some of our adjustments. We have identified the issue and fix it. It has nothing to do with our code or the system whatsoever	BME and UCY fixed the problem in the server

6.3. **Suggestions and future improvements**

Although in general terms, the users are satisfied with the pilot, we have observed some issues that could improve the application, most of them raised by users.

- The first thing to improve is the "design" of the device. The users indicated that the device was too big and heavy, occupied a lot of space and that it could not be moved without any help.
- Most of the users who participated in the project had a computer and Internet connection. They pointed out that the YooM should work using wifi, without cables.
- Apart from its size and weight, they stressed that the prototype has too many external accessories (speakers, cameras). They would like that the external accessories were incorporated into the device. The users of the Day Centre also mentioned that they were missing a keyboard.
- As for the software, they consider the options presented in the program are correct, because they think that the device must be intuitive and easy to use, but they think that, for a possible future sale, it should include more options. They think that, in a short time, a person with few computer skills can master the YooM, and when that happens, that person should be able to use other applications and functions, such as:
 - o Inclusion of more games, such as chess, card games etc.
 - o Ability to open up to social networks like Facebook, Twitter, Skype, etc ...
 - o Using “free” internet, via navigator.
 - -Missed call feature
- The price was very high for an elderly person in Spain. This technology should count with some public funding system so people could buy it at a reasonable price.