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PeerAssist

A P2P platform supporting virtual communities to assist independent living of senior citizens

Deliverable 2.2.
"PeerAssist use scenarios definition"

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1. Introduction

The main goal of the PeerAssist project is to provide a flexible Peer-to-Peer (P2P) platform which will allow elderly people to communicate with their friends, family, neighbours, caregivers, etc. With the PeerAssist platform they could build virtual communities based on shared interests and needs. The community building will be achieved using information extracted from peer roles, profiles and user modelling. Analyzing and understanding elderly people's needs (in general, but also in relation to their familiar and social relationships situations) is a key prerequisite to build this type of technological device, which could have a substantial impact on the end-users' daily life.

The present document describes the procedures and results elicited from the first phase of user requirements' in PeerAssist project, which took place at INGEMA headquarters (Spain) and at the facilities of the Municipality of Athens Development Agency (Greece).

This deliverable starts with a brief overview of the evaluation methodology and assessment tools administered by all user partners (i.e. a common methodology), describing the questionnaires and interviews used.

Afterwards, a description of end-users' characteristics from both countries is provided. In a subsequent section, main results for end-users in each user site (INGEMA in Spain and AEDA in Greece) is presented. Results analysis, both a quantitative and a qualitative approach are presented in order to gather detailed information that may raise unique but also common results and conclusions per user sites.

Thirdly, taking into account users' feedback from the evaluations, the scenarios, use cases and some implications for PeerAssist platform are presented. Specific sensitive information that may lead to identify specific persons who have participated in the project have been changed (sex or age), and some features corresponding to different users have been either grouped or separated into different profiles in order to address their needs.

Finally, an annex with the material (interviews, questionnaires and scripts) used in evaluations (in their English version) can be found.

2. Evaluation procedures

2.1. Introduction

One of the main goals of this project is to develop a platform which will allow active elderly people who are 60 or older, with normal cognitive aging, not necessarily familiar with information and communication technologies (ICT), to built virtual communities based on

interests and needs they share. When trying to establish an evaluation procedure for the project, initially it was considered to include a neuropsychological evaluation to discard users with possible cognitive impairments. Moreover, the satisfaction with life, social relationships, family situation, health status and experience with technologies have also been tested.

Hence, it was decided that it was necessary to include a validated scale to assess the life satisfaction of the participant. So, for this reason it was decided to use the Satisfaction With Life Scale (SWLS) (Diener et al., 1985, validation in Spanish by Pons et al., 2002) and translated into Greek.

The assessment limits in this project are clear, since there is no control group available, and it is difficult to have the users assessing a finalized PeerAssist platform within the time frame of the project to have a pre-PeerAssist & post-PeerAssist comparison (i.e. to have them assessing PeerAssist for a period long enough that significant quantitative results in terms of improvement on their quality of life could be attributed to the use of PeerAssist platform).

However, it was considered that the inclusion of these questionnaires could be a way to know the main requirements of the users in these domains and try to perform at least a qualitative evaluation of the key areas that PeerAssist targets to improve.

Finally, a desirable for the PeerAssist project but not mandatory additional criterion was that the users had a basic domain of Information and Communication Technologies (ICTs); the purpose of this additional criterion was to gather detailed information related to usability and accessibility characteristics of technologies they already use. However, the inclusion of both non-expert and expert users has been pursued since this allows the PeerAssist platform to reach two different types of profiles:

(1) users already familiar with technology, and

(2) users not familiar with technology but who would use it if it was accessible, useful and easy-to-learn.

2.2. Evaluation methodology and metrics

2.2.1. Description of the common procedure

Both Greek and Spanish users answered a common questionnaire divided in 10 different domains: sociodemographics, family situation, social relationships/interaction, leisure activities, health status, satisfaction with life, perceptual abilities, motor symptomatology, cognitive abilities and interaction with technology.

To evaluate sociodemographic data, family situation, social relationship/interaction, leisure activities, perceptual abilities, motor symptomatology and interaction with technology, ad-hoc questionnaires were created.

- Sociodemographic data includes questions about sex, type of residence, educational attainment, marital status, occupational data, etc.
- Family situation includes questions about the couple and children, distance from relatives, both "objective" and perceived frequency of contact, and types of communication (face-to-face, telephone…).
- Social relationships includes both quantitative and qualitative measures of social interaction, like frequency of visits, contexts where social contacts are developed, persons available in case of need, etc.
- Leisure activities includes frequency and desired performance of various activities: reading books, cinema, concerts, playing cards, travel, etc.
- Health status is measured through one questionnaire, SF-12 Health Survey Test (Ware et al., 1996, validation in Spanish by Vilagunt et al., 2005), a shorter version of the SF-36 test (Ware et al., 1992). This test includes 12 questions relating to: physical functioning, body pain, social functioning, etc.
- To evaluate the satisfaction with life we used the Satisfaction With Life Scale (SWLS). It is includes of 5 items and has an internal consistency of α =0.85.
- For perceptual abilities and motor symptomatology, we evaluate sight and hearing of users, as well as motor symptomatology like a degenerative osteoarthritis or arthritis.
- Cognitive abilities are evaluated by two different questionnaires, Memory Complaint Questionnaire (MAC-Q) (Crook, Feher & Larrabee, 1992; Montorio & Izal, 2002, for the Spanish version) and Digit Symbol Substitution Test (DSST) (Wechsler, 1981). MAC-Q is a self-report questionnaire of five questions addressing daily activities, three questions addressing overall memory functioning comparing present moment to when the person was in his/her better moment (where the respondents must choose one of the 5 options ranging from "very good" to "very bad"), 1 question addressing the sense of worry about one's memory and 4 questions about the perceived frequency of specific types of forgetfulness typically associated to old age. DSST measures the attention, perceptual speed, motor speed, visual scanning and memory of the users.
- Technological expertise (which was included as an addendum in order to gain some basic information about users who were going to interact with technology in the

project) is evaluated by basic questions about the use of computers, cell phones, CD player, etc.

Finally, the frequency of use and the technological expertise of their family and friends was also evaluated. The Common Questionnaire is included in the Annex of this deliverable.

2.3. Sample: End-Users

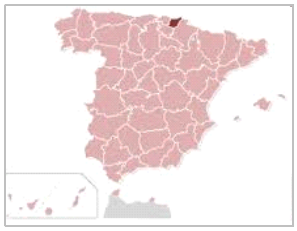

Image 1: Guipuzkoa (Spain)

2.3.1. Sociodemographical and health data

2.3.1.1. Spanish sample

The Spanish sample who participated in the evaluation procedures was composed of 20 participants, 8 men and 12 women, with an age range from 57 to 78 (X=66.35; SD=6.532). All the users live in the province of Guipuzkoa (Basque Country, Spain).

First, we contacted the possible participants by telephone, to explain the PeerAssist project and settle the dates for the interviews with each one of them.

In the interview days, all the participants were thanked for the collaboration in the study and were informed of the purpose of the PeerAssist project. Then, they were given the information sheet of the project and the informed consent to be signed in order to participate in the study.

Regarding the marital status, 55% of the sample is married, 20% single, 20% separated, and 5% widowers or widows. 60% of the participants have 2 or 3 children, and only 15% have 4 or 5 children. 60% live with his/her couple or with his/her couple and children, and 25% live alone. All of them live in their own house.

The users showed homogeneous features in terms of educational level: 13 participants finished the primary school, 4 have professional training, 2 participants have graduated from university, and one of them has a master's degree. The results show that they are an active sample, since 50% of them are receiving a course in different associations for elderly people (e.g. literature, theater, dancing, aerobics, etc.)

The results obtained on the perceived health domain show that 80% of the sample expressed that they have good or fair health status, 15% very good and only 5% excellent. And regarding the health status and activities of the daily life, 75% of the participant show a good health status to develop moderate activities such as moving a table, pushing a vacuum cleaner or walk more than one hour.

Regarding the emotional status, in general, 65% and 60% of the participants feel energetic and calm and peaceful always or most of the time respectively, and 15% feel energetic only sometimes. Moreover, 60% of the sample never feel downhearted and sad or only sometimes.

Some of the participants (30%) informed that during the last four weeks they felt that they forgot things. Only 20% have motor symptomatology like a degenerative osteoarthritis or

arthritis. 95% use glasses, none use a hearing-aid, but 30% of the sample have a problem to hear a television program at a level that others consider standard.

2.3.1.2. Greek sample

Image 2: Athens (Greece)

The Greek sample was composed of 20 participants, 9 men and 11 women, with an age ranging from 67 to 76 years old (X=71.70; SD=2.67). All of the users live in Athens (Greece).

Regarding the marital status, 40% of the participants are widowers or widows and half of the sample is either married (25%) or separated (25%). 30% of the sample don't have children and 45% have 2 or 3 children. All of them live in their own house.

They show a very similar educational profile: 75% have high school and 25% primary school degrees. None receives leisure courses for elderly people.

Regarding the perceived health, 50% commented that they have good health status, 30% fair and 10% poor. And related to the health status and activities of the daily life, 75% of the sample show a good health status to develop moderate activities such as moving a table or walk more that one hour, but some of them informed that they are very limited physically (25%) and 65% have some difficulties to climb stairs.

The results obtained on the emotional status show that 15% feel calm and peaceful always or most of the time (30%), 35% and 25% of the participants feel energetic most of the time, and sometimes respectively, while 45% of the sample feel downhearted and sad sometimes.

Some of the participants (15%) mentioned that during the last four weeks they felt that they forgot things. Only 15% showed motor symptomatology like a degenerative osteoarthritis or arthritis. 50% use glasses, none use a hearing-aid, but 30% of the participants have a problem to recognize a person to a distance of four meters or across the street.

2.3.2. Leisure activities and interaction with technology

2.3.2.1. Spanish sample - Leisure activities

Results obtained on the leisure activities showed that most of the persons (70%) are very happy with the time that they have available to meet new people or to be with relatives. Moreover, 85% indicated that they have enough time for leisure. 50% go out weekly with relatives or friends and 30% daily (70% of them mentioned that it is enough).

Regarding leisure culture activities the Spanish sample showed the following results: 60% of the participants never go to the cinema and 20% go 2 or 3 times per month; only 30% go

to museums once a year and 50% never go to museums, while 30% declared that they want to go more often; and 45% stated that they never go to a concert.

Some participants organize meals for relatives daily (15%), but most of them (45%) hardly never, while 75% of the sample never practice craftwork.

In general, most participants (80%) never exchange books or magazines and they are not interested in this type of activity. Nevertheless, playing cards or chess is a type of activity more common among participants, 25% play weekly or monthly (20%).

Most participants play sport everyday (50%) or weekly (20%) and 40% of the participants declared that this is not enough and they want to play sport more frequently. 20% are not used to travelling, 20% travel every 2 or 3 months, and 40% travel every 6 months.

In general, the Spanish participants are active people spending their leisure time practicing different types of activities. Although they have much time for leisure, they spend it in outdoor activities such as go out to bars or playing sport. The results showed that the Spanish users did not want to spend their leisure time in enclosed areas (e.g. museums, cinema, concerts, etc).

On the other hand, most of them are happy with the time they have available for leisure, but they would like to play sport more frequently because it is good for their health.

2.3.2.2. Greek sample - Leisure activities

In terms of leisure habits, all Greek users are very happy with the time they have available to meet people or to be with their relatives; moreover all of them indicated that they are happy with the time that they have for their leisure activities.

All participants go out weekly (30%) or monthly (70%), and most of them (75%) indicated that this is enough and they don't want to go more. And regarding leisure culture activities like go to a cinema, to the museum or to a concert, Greek sample never practice this type of activities.

Participants never practice craftwork , but almost half of the sample (40%) organize meals for relatives monthly (25%) or weekly (15%).

In general, all the participants never exchange books or magazines and they are not interested in this type of activity. Furthermore, only 20% of the users play cards or chess monthly and in their opinion it's enough and they don't want more time to practice this activity.

Finally, the Greek users never play any kind of sport and they are not used to travel either.

In general, if we compare the results from both samples, we could determine that Greek sample is less active that Spanish sample. Maybe the reason could be that in the Greek sample the participants are older (X=71,70) that in the Spanish sample (X=66,35).

2.3.2.3. Spanish sample - Interaction with technology

In the Spanish sample, 40% of the participants have never used a computer and the remaining 60% used it since more than 10 years (25%) or between 2 or 5 years ago (35%).

Regarding the internet habits (as can be seen in Figure 1):

- 55% use Internet to get information about the environment (for example: travelling, search maps, practice languages, etc).
- Only 20% use computer to chat via Skype or Messenger programs.
- 95% never use computer to contact with relatives or friends via Facebook or Twitter, although they know the existence of this kind of online social networks.
- 40% receive emails and read them.
- 50% use computer to read newspaper or to consult opinions about a book.
- Only 15% use computer to watch film or listen to music.
- 85% never use computer to play.
- 20% use computer at work.

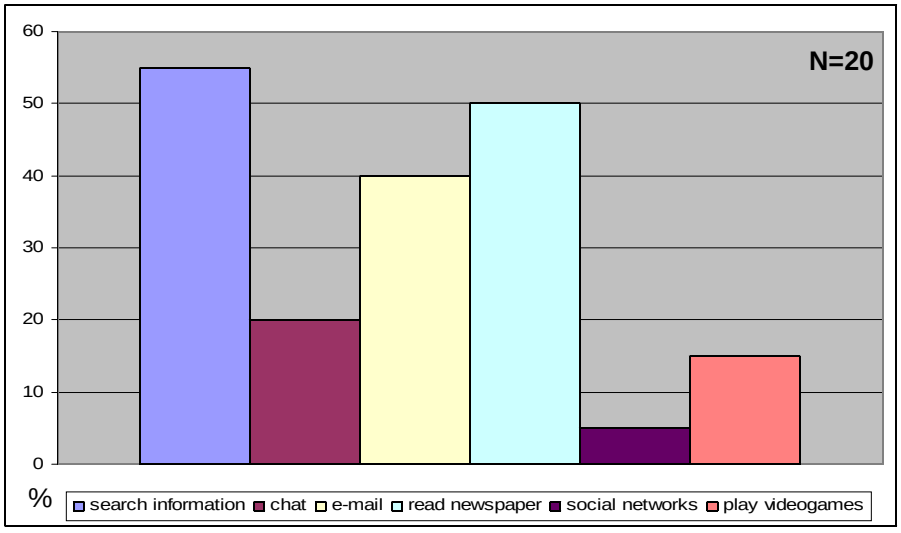

Figure 1: Internet habits in the Spanish sample

65% of the Spanish sample would like to talk with relatives via internet or meet new people.

13 out of 20 (65%) never used a touch screen, but 6 have used small touch screen and 1 big touch screen. 45% think that this kind of screen is easy to use and for 50% it is comfortable. Among the people who use a small touch screen, 25% use it daily or sometimes, and 5% use it monthly.

In terms of interaction between users, relatives and friends with technological devices the results are the following (specifically, the results for relatives and friends are depicted in Figure 2):

- 35% use the mouse pointer daily and 55% never. 75% of the relatives and 45% of the friends have mouse in their own houses.
- 90% never use webcam and only 10% use this device sometimes or monthly. 55% of the relatives and 25% of the friends have one in their own houses.
- 45% use keyboard daily and 50% never. 75% of the relatives and 45% of the friends have keyboard in their houses.
- For the headphones and microphone the results are very similar, 25% use headphones sometimes and 10% use microphone also sometimes. 75% of the relatives and 25% of the friends have headphones, and 40% of the relatives and only 15% of the friends have microphone.
- 90% of the Spanish sample declared that they watch TV everyday and 95% of their relatives and friends have one and watch it everyday.
- The CD player is used only from the 15% daily, while 60% never use it or only sometimes. 50% of the relatives and 45% of the friends have CD player.
- 85% of the participants informed that they use mobile phone daily or only sometimes (10%). 70% of the relatives and friends have one.
- For the touch screen, Spanish participants informed that 30% of the relatives and only 10% of the friends have experience with small touch screen.
- None have previous experience with speech recognition program and the results are the same for relatives and friends.

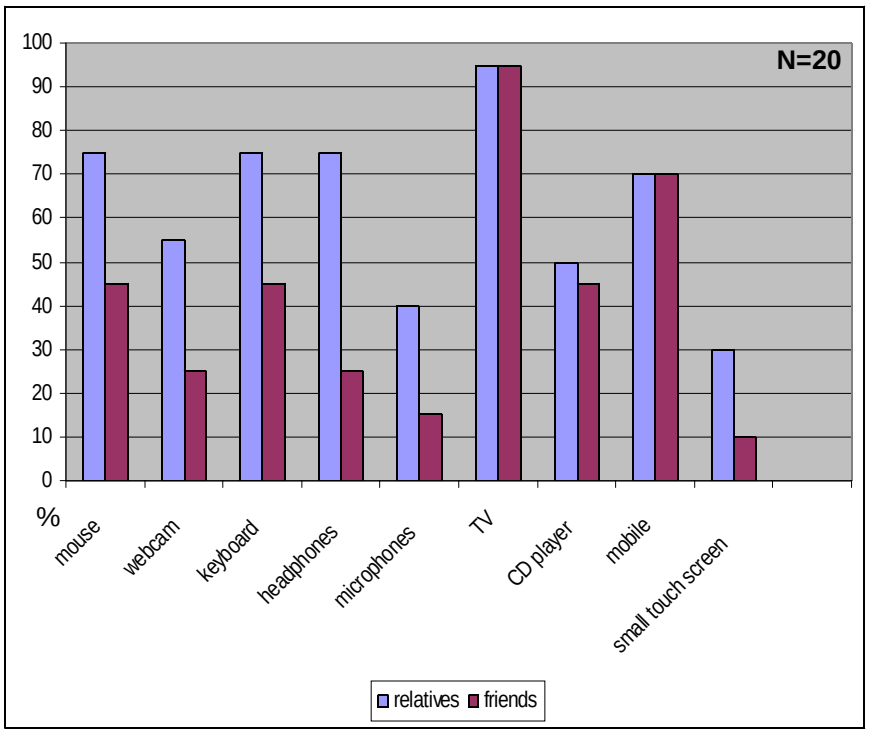

Figure 2: Interaction between relatives and friends with technological devices

In general we can conclude that the Spanish users are familiar with the new technologies. More than half of the sample use or had used a computer during the last 10 years, and at present they use their computer almost without problem. Moreover, the results showed that the the computer is used mainly to search information, to check e-mail and to read newspapers, but not for contact with relatives or friends. Nevertheless, if the users want, they could contact with their relatives and friends by Internet, because a large percentage of them have equipment available in their own house.

On the other hand, in the case of the relatives and friends, the results also showed that they are familiar with new technologies, but specially the relatives. More half of the relatives have in their own house a TV, computer, headphones, webcam and mobile, so if they want they have another way of communication with the users.

These results are interesting for the PeerAssist project in the sense that now we know that in general in the Spanish sample, most of their relatives have the technological equipment necessary to communicate with the users in alternative ways such as the ones proposed in the project. Moreover, and in relation with the previous idea, more than half of the sample would like to talk with relatives via the Internet or meet new people. Therefore, we can

conclude that the Spanish sample is interested for the project and the people involved are close to the type of the user necessary for the trials.

2.3.2.4. Greek sample - Interaction with technology

In the Greek sample, 70% of the participants have never used a computer and the remaining 20% used it between 2 or 5 years.

In terms of preferred uses for the computer in general Greek users, the results are the following:

- 90% of the sample never use Internet, e-mail or Facebook
- only 20% use computer to read newspaper or to consult other opinions about one book
- 90% never use computer to watch film or listen to music, to play or to work

The 90% of the Greek sample are not interested to talk to relatives via internet or meet new people.

90% have had contact with small touch screen, for 35% of them this type of screen are easy to use but for 40% is uncomfortable.

In terms of interaction with computer and others devices relating with technology the results are very limited because this sample of participants do not have much relation with new technologies:

- 20% use mouse sometimes and 75% never, the results are the same for the keyboard. All the friends and relatives have in their own house mouse and keyboard for the computer
- For peripheral devices, the results show that none uses a webcam and they do not have relatives or friends with this device. For headphones and microphone results are similar; only one persons use headphones and none uses microphone. Between relatives and friends only 10% of the them have headphones.
- 95% of the Greek sample declared that they watch TV everyday and 95% of their relatives and friends have one and watch it daily. Moreover, all the participants use mobile phone and their relatives and friends also have one.
- The CD player is used by only 10% daily, while 60% use it sometimes. 95% of the relatives and friends have CD player

- None has previous experience with speech recognition program and the results are the same for relatives and friends.

In general terms, we conclude that the Greek sample has a primitive relation with new technologies such as the computer and its peripherals. Nevertheless, most of the relatives and friends of the Greek sample has a computer and they are familiar with the new technologies, so they can participate to the PeerAssist trials.

Furthermore, although the Greek sample are not familiar with the new technologies, most of them are widow or separated, 30% of the sample do not have children, and 75% of them live alone and sometimes they may need help or more company. Moreover, in the case of Greek sample, 40% of the sample have a fair or poor health status. So, PeerAssist project could be a interesting solution to cover their needs.

2.3.3. Familiar and social relationships (Common results)

For the next two sections (Familiar and social relationships and memory levels) the results will be presented in common taking into account the data from both countries, because the sample is not very large and the differences between the Spanish and Greek sample for some of these variables is minimum.

A total of 40 people from Spain and Greece were assessed by means of the mentioned common questionnaires. The following lines address the results for specific variables: familiar and social relationship difference for sex and nationality.

We use to analyze the data the Chi-square test to see whether there is a relationship between two variables. The idea is to comparing the frequencies you observe in certain categories to the frequencies you might expect to get in those categories by chance.

First, a chi-square test of independence was calculated comparing the sense of *how easy is for you to see your relatives "face-to-face"* for Spanish and Greek users. A significant interaction was found ($\chi^2(3) = 14.463$, $p=0.002$), indicating that for Spanish people is very easy (50%) or easy to see their relatives "face-to-face" when they want, while for Greek people is only easy (50%) or difficult (40%).

In terms of how far their relatives live, significant interaction was found ($\chi^2(3) = 10.359$, $p=0.016$), indicating that Spanish users (40%) could go by walk and for 25% of the sample is necessary to take urban transportation; in the case of Greek users, for 50% of the participants it is necessary to take urban transportation and for 40% it is necessary the interurban transportation.

Regarding the relationship with the people they live with, again a significant interaction was found ($\chi^2(4) = 11.786$, $p=0.019$). For Spanish users this relation is good (35%) or very good

(25%), while for Greek users the results show that (75%) this relationship is nonexistent because this group of users live alone.

The questionnaire was also very revealing about the received visits from friends and relatives. A significant interaction was found ($\chi^2(4) = 11.309$, $p=0.023$), indicating that the majority of Greek users (75%) sometimes feel bad because they do not meet their relatives very often and 20% feel happy even their relatives visit them rarely. In the case of Spanish participants, 30% feel happy even their relatives do not visit them very often, 25% feel happy because they meet their relatives as many times as they want to, but 35% of them sometimes feel bad because they do not meet their relatives as often as they want to.

When asked about the frequency that they usually talk with their relatives by phone, a significant interaction was found ($\chi^2(3) = 15.702$, $p<0.001$), indicating that the Spanish sample talk with their relatives once a day or more (20%), 35% twice a week and 25% never. For the Greek sample, 75% talk once a week and remaining users talk twice a week.

In terms of quality of social contacts significant interaction was found ($\chi^2(4) = 20.502$, $p<0.001$), indicating that Spanish users were divided between those who keep social relationship outside home (70%) and somebody (10%) who go out , but they only relate to family. While for the Greek sample almost half of the sample (45%) indicated that they go out, but they only relate to family and 25% also go out, but they relate to family and neighbours.

Regarding how many people (relatives or friends) they feel confident enough to visit them at their homes, the results show again significant interaction ($\chi^2(3) = 15.333$, $p=0.002$). The Spanish people (35%) feel confident enough with one or two persons to visit them in their houses and 30% with five or more friends, while for the Greek sample most of them (70%) feel enough confident with one or two persons to visit them in their houses and 30% with three or four friends.

When we asked about the frequency they talked to their friends by phone, a significant interaction was found ($\chi^2(3) = 10.399$, $p=0.015$). Almost half of the Spanish sample (40%) never talk to their friends by phone and 25% once a week. If we compare with the Greek sample the results are very different, 45% talk with their friends twice a week and 20% once a day or more.

The retirement is a very important phase in elderly people's life, so it is necessary to ask about it and if they make new friends after retirement. The results show a very significant interaction ($\chi^2(3) = 27.084$, $p<0.001$). Specifically, the Spanish sample (50%) they have not made new friends after retirement and 30% five or more. In the case of the Greek sample, 90% of them have made one or two new friends after retirement.

Regarding social activities and social relationship the results show a significant interaction ($\chi^2(3) = 12.376$, p=0.006). The Spanish sample (30%) informed that less than once a month they leave their home to visit friends on weekends or to go shopping with them and 30% do it once a week or more. For the Greek sample the distribution is different, half of the sample (55%) less than once a month and 45% from 1 to 3 times a month.

Finally, when asked about where they mainly focus their social relationship the results do not show a significant interaction. Most of the sample meet people in more structured places such as: civic centres, elders' associations, etc.

For the sex variable significant interactions were not found. That is, there is no relationship between sex (male or female) and get a different score on the 11 variables presented in previous analysis.

As noted previously, Greek participants do not have much relation with new technologies and also not receive much social support from family or friends. This finding is consistent with the results shown in the previous paragraphs. For Greek users is difficult to see their relatives face-to-face and almost all of them need urban and interurban transport to visit relatives. Therefore, PeerAssist platform is a good support for this particular profile of people.

In addition, although many of the Greek users do not like this type of communication through the platform, 75% of them feel bad because they do not see their relatives very often. Moreover, many of the Greek participants (75%) speak only once a week with their families; they hope that by installing the PeerAssist platform at home the frequency of these contacts could be improved.

In the case of the Spanish sample, the results also indicate that the PeerAssist platform can be a good device to support users in their social and family relationships. In addition, the Spanish participants are more familiar with new technologies so the acceptance of the PeerAssist platform may be better for them. Regarding the results observed in the previous analysis, Spanish users have many friends and the frequency of these contacts is very high. However, almost half the sample (40%) never talks to his/her friends by phone, so PeerAssist platform is a good device to further increase the frequency of social contacts through other ways of communication. Furthermore, in the case of the Greek participants, most of the sample (90%) has made new friends after retirement, but only 45% of them go out and interact with family and friends. Therefore, in order to maintain the new social contacts made after retirement, PeerAssist platform is a good solution for them.

2.3.4. Memory levels (Common results)

Daily Activities

First, 22.5% described their ability to remember a new person's name as bad, 40% describe this ability as good, and 25% very good.

Second, 40% described their memory as good when it comes to remember data from a newspaper article they have just read, 27.5% very good, being only 12.5% who thought they are bad in this domain.

Third, most of our sample described themselves as good (37.5%) or very good (45%) when it comes to remember specific tasks as turning off the light or electric devices, and locking the door when leaving home; 5% described this ability in themselves as normal and only 7.5% thought they are bad with this specific task.

Fourth, in prospective memory tasks related to taking objects previously planned to take, only 5% thought they are bad at remembering this kind of things. 7.5% thought they are normal, 47.5% thought they are good and another 35% thought they are very good.

Fifth, when it comes to remember recently received specific verbal instructions to reach one address or place, only 7.5% thought they are bad at it; 10% thought their memory in this area is normal, 40% assessed it as good and 35% as very good.

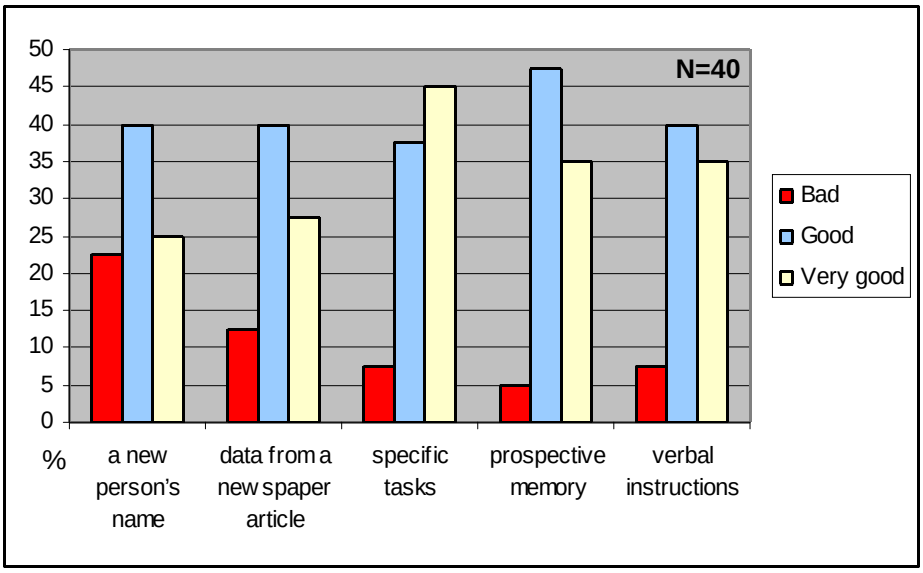

Figure 3: Results for daily activities

Overall memory functioning

Three questions of this set showed the following results:

First, when it came to describe their own memory when compared to the average of people of their same age group, 25% thought it was bad, most of them (47.5%) thought it was normal, 15% described it as good, and 7,5% as very good.

Second, when it came to compare their memory among now and the moment their memory was at its best performance, most of them described it as bad (40%), 20% described it as normal, 30% described it as good and 7,5% as very good.

Third, also comparing the present and the moment they perceived their memory was at its best performance, most of them described their remembering speed as bad (25%), 45% described it as normal, 15% described it as good, 10% as very good.

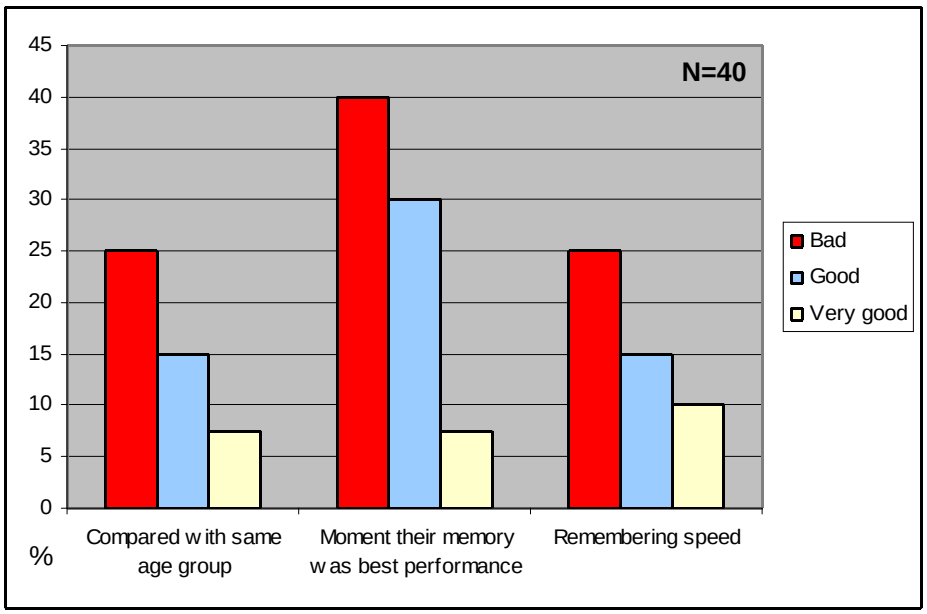

Figure 4: Results for overall memory functioning

Sense of concern about one's own memory

Regardless the previous description of their overall memory functioning, most of them reported a very low concern (17.5%), while 37.5% are very concerned about the functioning of their memory.

Specific forgetfulness typically associated to old age

Information about four questions was gathered regarding specific type of daily life forgetfulness in the elderly.

Case #1: “Frequency of forgetting that you had already told something to someone and you finally tell the same again to that person” - A majority of our sample reported that this kind of oversight happens to them only sometimes (32.5%) or never (22.5%), while for 2.5% it happens very often.

Case #2: “Frequency of having difficulties to remember a specific word they plan to use” - The majority reported that this is a quite frequent (52.5%) or very frequent event (15%). Another 12.5% reported this to be a rarely event in their lives, or almost never (12.5%).

Case #3: “Tip-of-the-tongue phenomenon” - Everybody reported having suffered this experience. 44.4% rarely and only 35% stated that it happened to them only sometimes.

Case #4: “Frequency of meeting people that look familiar but without being able to remember when you have seen them before” - A majority of 40% reported that it is a rarely event, 17.5% stated that it happens to them only sometimes, and another 27.5% stated that it has never (or almost never) happened to them something like that.

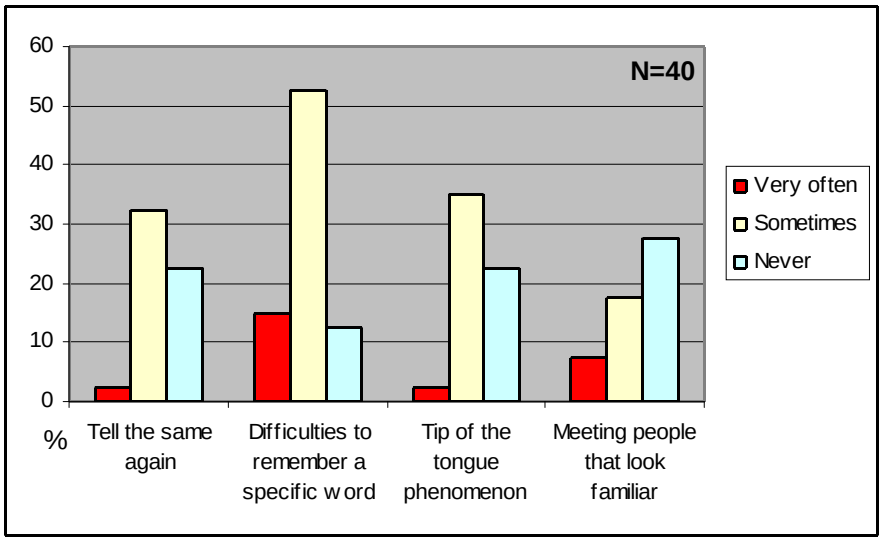

Figure 5: Results for specific forgetfulness

In general for the daily activities the users showed good results, except for two specifically items (to remember a new person's name and data from a newspaper article) in which the results were bad. Nevertheless, for remembering specific tasks (e.g turning off the light or electric devices) almost half of the sample described themselves as very good.

On the other hand, regarding to overall memory many of the participants thought that it was bad, specifically when they compared their memory now and the moment in which their

memory was at its best performance. Moreover, this data match up with the results of concern about the functioning of their memory (37.5% of them are very concerned).

In general, the results for forgetfulness are normal because they are age-related, although more than half of the sample have difficulties to remember a specific word sometimes.

2.4. In-Deep quantitative analysis of results

2.4.1. Goals

Besides the descriptive results that have already been presented, the aim of this evaluation was to raise common features and main differences that users may show throughout the different sites where they were recruited and evaluated. Hence, for a more precise analysis, the following hypothesis were established in order to obtain meaningful information that could be useful for the PeerAssist project.

2.4.2. Hypotheses

In order to guide the results analysis the following hypotheses are formulated:

1. Users who have more contact with their relatives and better quality of social contacts will score higher in the use of the computer.
2. Users who do not have sufficient available time for leisure activities will use computer for a longer time.
3. Users who perceive that their health status is good will be more interested in talk to relatives via Internet or meeting new people.
4. Users who are more interested in talking to relatives via Internet or meeting new people will show better scores in satisfaction with life scale (SWLS).
5. Users who perceive their ability to process new information is speed, will score less punctuation in the use of the computer.
6. Users who are more concerned about their memory loss will obtain lower score on the use of the computer.
7. Users who are more concerned about their memory loss will be less interested on talking to their relatives via Internet or meeting new people.
8. Users who showed more problems in tasks measuring fine motor abilities will show lower scores in satisfaction with life scale.

In the next section, we will check, one by one, which hypotheses are accepted (i.e. which means that the results let us defend the statement enunciated in the hypothesis and to what extent results confirm these hypotheses), or refused/rejected (which means that the results do not agree at all or that observed or expected differences are attributable to random causes).

2.4.3. Hypothesis contrast: acceptance or refusal of each Hypothesis

In the current section, we present the contrast of each hypothesis, which was performed using SPSS 16.0 for Windows for statistical analysis. For each hypothesis presented above, we present the results (including whether they are significant or not) and how these results lead to the acceptance or refusal of each specific hypothesis.

Hypothesis 1: "Users who have more contact with their relatives and better quality of social contacts will score higher in the use of the computer."

With the aim to establish whether the family and social situation could be a determining factor of users' attitudes toward the use of the computer we used a crosstab and calculated a chi-square test of independence, comparing the answer of the questions 2.6 (*Do you meet your relatives as often as you would like to)*, 3.1 (*Quality of social contacts)* and 10.3 (*Have you ever used a PC).*

The following interactions were found:

- For the question "*Do you meet your relatives as often as you would like"* no significant relationship was found.
- Significant results (in the limit) were found ($\chi^2(8) = 15.235$, $p=0.050$) for the question "*Quality of social contacts"*. These results show that people who keep social relationship outside home never use computer or have used it during the last 2 or 5 years.

The Hypothesis 1 is refused.

Hypothesis 2: "Users who do not have sufficient available time for leisure activities will use computer for a longer time."

In this case, a chi-square test of independence was run but finally no statistically significant differences appeared ($p>0.05$). Hence, Hypothesis 2 is refused: in this sample of users, do not agree with the available time for leisure time does not seem to be related to use computer for longer time.

Hypothesis 3: "**Users who perceive that their health status is good will be more interested in talk to relatives via Internet or meeting new people."**

Considering the difference between the Spanish and Greek sample in their health status and their general use of new technologies, we could expect difference between the two samples of participants.

In this case, we use the same procedure to test the Hypothesis number 3. This hypothesis was totally refused having obtained no significant relation between the different health status and their interest to talk to relatives via Internet.

Hypothesis 4: "Users who are more interested in talking to relatives via Internet or meeting new people will show better scores in satisfaction with life scale (SWLS)."

With the aim to establish if the interest to talk to relatives and meet new people via Internet could be a factor to score more on SWLS test, users were divided in two groups: (1) users who are not interested in meet new people or talk to relatives and (2) people who indicated that they are interested in this idea.

To determine if there is a significant relation in the sample, the necessary statistical analysis was conducted. The comparison of the SWLS punctuation and their interest in this new idea of communication was conducted showing no significant results.

Thus, the hypothesis 4 was totally refused, the results showed that there is no significant differences between the different opinions of the participants. That is, these data do not support the hypothesis that the people who are more interested in this alternative way of communication will show better score in SWLS test.

Hypothesis 5: "Users who perceive their ability to process new information is speed will score less punctuation in the use of the computer."

According to the descriptive information provided in each sample description people indicated that their ability to process new information is (1) very poor, (2) poor, (3) average, (4) good or (5) very good.

Significant results were found ($\chi^2(6) = 19.202$, $p=0.004$) showing people who informed that their memory is average to process new information never (55.5%) use a computer or they used a computer between 2 and 5 years ago (44.4%). Moreover, the participants who indicated that in their opinion their memory is poor to process new information, they never user a computer (80%) or have used it between 2 and 5 years ago (20%).

As a consequence, Hypothesis 5 is accepted.

Hypothesis 6: "Users who are more concerned about their memory loss will obtain lower score on the use of the computer."

Considering the limitations to ask about their worries of their actual memory capacity we merged different users' answers in three different categories: (1) nothing, (2) not much and (3) a lot. We tried to determine whether the users who are more worried about their memory never use a computer.

Statistically significant differences were not found between the three groups of users. Hence, Hypothesis 6 is totally refused.

Hypothesis 7: "Users who are more concerned about their memory loss will be less interested on talking to their relatives via Internet or meeting new people."

In this case, the aim was to check if the users who are more worried about their memory capacity perhaps they will be more interested in the idea of talking to relatives or meet new people via Internet. Again the memory capacity was merged in three different categories: (1) nothing, (2) not much and (3) a lot. In order to achieve a clear outcome, we used a chi-square test of independence to find if those worried about memory capacity were more open to use Internet to talk to relatives and meet new people.

A significant interaction was found ($\chi^2(2) = 13.722$, $p=0.001$), indicating that people who are happy with their memory capacity (62.5%) are interested in the idea of meeting new people and talk to their relatives using the computer. On the other hand, people who are very worried about their memory capacity (86.6%), they do not like this new way of communication.

Hence, the Hypothesis 7 is accepted.

Hypothesis 8: "Users who showed more problems in tasks measuring fine motor abilities will show lower scores in satisfaction with life scale."

In order to know whether there is relation in our sample between satisfaction with life and fine motor abilities, direct punctuations from the Gibson test were analyzed by means of Spearman *rho* correlation in which differences between users' scores on Gibson's maze and scores for satisfaction with life scale were analyzed.

Nevertheless, no statistically significant differences appeared ($p>0.05$). Hence, Hypothesis 8 is refused: in this sample of users, appearance of problems with fine motor abilities does not seem to be related to satisfaction with life.

Table 1: Summary of hypothesis and results to their contrast

Hypothesis	Partially Accepted	Accepted	Refused
Users who have more contact with their relatives and better quality of social contacts will score more highly in the use of the computer			x
Users who do not have sufficient available for leisure activities will be use computer for a longer time			x
Users who perceive that their health status is good will be more interested in talk relatives via Internet or meeting new people			x
Users who are more interested in talking to relatives via Internet or meeting new people will show better scores in satisfaction with life scale (SWLS)			x
Users who perceive their ability to process new information is speed will score less punctuation in the use of the computer		x	
Users who are more concerned about their memory loss will obtain lower score on the use of the computer			x
Users who are more concerned about their memory loss will be less interested on talking with their relatives via Internet or meeting new people		x	
Users who showed more problem in tasks measuring fine motor abilities (Gibson's spiral maze) will show lower scores in satisfaction with life scale			x

3. User requirements

User requirements' prioritization

After the assessment in January in the PeerAssist project, and having obtained information about the needs and desires of the participants, we concluded to a prioritized list of users requirements that should guide the technical development of the platform PeerAssist. The prioritisation is based on making a judgment about the requirements obtained in terms of High priority, Medium Priority, and Low Priority. The different categories are established using the frequency in which the main topics were addressed as a need by the users.

It is difficult to balance and represent the needs of users due to the different outcomes that the assessment provides: the frequency of user response (the number of users stating the same scale answer), intensity in terms of preference, and temporal frequency (never, sometimes, always ...). In every case, we have applied the same criteria to establish a requirements prioritization which lead us to a manageable amount of data that allows to choose and evaluate the single requirement based on the prioritization.

To address these issues, the transformation of the results was done according to the criteria of the evaluation plan used, and also taking into account the frequency of events, ie, the frequency of users who respond to those needs. The outcome transformation of the user needs in high, medium or low impact came from the establishment of a threshold in the frequency of the answers. The judgment was based on percentage.

(H) High Priority (More than 50% of the users have stated the need)

- The finding is highly relevant. If it is not accomplished, the product could fail.
- Frequent and re-occurring.
- It is broad and will have interdependences with other requirements.

(M) Medium Priority (Between 30% - 50% of the users have stated the need)

- The finding, if not accomplished, will be difficult for some participants.
- Not to cope with this finding can cause frustration or confusion in many users.
- The requirement might affect other tasks.

(L) Low Priority (Less than 30% of the users have stated the need)

- A few participants might experience frustration and confusion if this requirement is not addressed.
- This specific requirement is not related to others.

FAMILIAR SITUATION

Number	1
Issue	Difficulties to see relatives face-to-face
Spain %; Prioritization	15%; **(L)**
Greece %; Prioritisations	50%; **M**
Final Prioritization	**M**
User requirements	The PeerAssist project could increase the communication face-to-face of the user using for example the webcam. Nevertheless is necessary to resolve the problem of webcam because it is not a common device between the users (*I.51), and their relatives (*I.64) and friends (*I.75). They are not accustomed to use the webcam, so the integration of this device in the PeerAssist platform it is something to be considering.

Number	2
Issue	Difficulties to visit relatives (it is necessary to take transportation)
Spain %; Prioritization	60%; **(H)**
Greece %; Prioritization	100%; **(H)**
Final Prioritization	**(H)**
User requirements	The PeerAssist user should be able to call a taxi or check the schedule of other transportation (e.g. train, bus, etc)

Number	3
Issue	Living alone

Spain %; Prioritization	25%; **(L)**
Greece %; Prioritization	75%; **(H)**
Final Prioritization	**(H)**
User requirements	The PeerAssist user should be able to ask for: -help to activities of daily living: cleaning, dress up, etc. - resolving a momentary problem - notifying for emergency situations

Number	4
Issue	Feel bad because they do not meet relatives very often
Spain %; Prioritization	35%; **(M)**
Greece %; Prioritization	80%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	5
Issue	Speak to relatives by phone
Spain %; Prioritization	75% **(H)**
Greece %; Prioritization	100% **(H)**
Final Prioritization	**(H)**
User requirements	They usually speak with their relatives and friends (*I.8) using the phone. Almost all of them have a mobile phone (*I.57, *I.70, *I.81). Control the call function through the

	system (e.g. Skype)

SOCIAL RELATIONSHIP

Number	6
Issue	Keep social relationships outside home
Spain %; Prioritization	85%; **(H)**
Greece %; Prioritization	20%; **(L)**
Final Prioritization	**(H)**
User requirements	

Number	7
Issue	Meet friends frequently
Spain %; Prioritization	60%; **(H)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(H)**
User requirements	Support the function of "meet friends" without the need of call using the phone. (eg to notify a message through the system itself or with a vote on something similar to Doodle) (*I.6 and *I.7)

Number	8
Issue	Speak to friends by phone frequently
Spain %; Prioritization	60%; **(H)**

Greece %; Prioritization	65%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	9
Issue	Somebody who could take care of me as long as I need
Spain %; Prioritization	50%; **(M)**
Greece %; Prioritization	20%; **(L)**
Final Prioritization	**(M)**
User requirements	Create a network of caregivers with friends who are available to care for the user who is ill at a particular time. Create a network of caregivers. Create a network of caregivers with people who want to realize a volunteer activities (e.g. nursing or teaching to manage the PeerAssist platform.

Number	10
Issue	Meet people at structured places
Spain %; Prioritization	65%; **(H)**
Greece %; Prioritization	60%; **(H)**
Final Prioritization	**(H)**
User requirements	Facilitate to the users the search of compatible people in the system. Divide any compatible people based on their

	main interests.

LEISURE ACTIVITIES (FREQUENCY)

Number	11
Issue	Gone out Bar
Spain %; Prioritization	85%; **(H)**
Greece %; Prioritization	30%; **(M)**
Final Prioritization	**(H)**
User requirements	

Number	12
Issue	Go to cinema
Spain %; Prioritization	35%; **(M)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(M)**
User requirements	Search information about new films and opinions from other users

Number	13
Issue	Exchanging books/magazines
Spain %; Prioritization	20%; **(L)**

Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	14
Issue	Physical activity
Spain %; Prioritization	75%; **(H)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(H)**
User requirements	Provide opportunity for physical exercise. Recommend exercises, support, reinforcement. (e.g. Wii play)

Number	15
Issue	Play cards/chess
Spain %; Prioritization	35%; **(M)**
Greece %; Prioritization	20%; **(L)**
Final Prioritization	**(M)**
User requirements	Develop an easier application to play in the PeerAssist system (e.g. Solitaire, others??)

Number	16

Issue	Go to museum
Spain %; Prioritization	50%; **(M)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(M)**
User requirements	

Number	17
Issue	Go to concert
Spain %; Prioritization	55%; **(H)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(H)**
User requirements	Search information about concerts (e.g. prices, public transportation)

Number	18
Issue	Travel
Spain %; Prioritization	80%; **(H)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(H)**
User requirements	General information about travel (e.g. prices, possible “new travel friends”)

LEISURE ACTIVITIES (WISHES)

Number	19
Issue	Gone out Bar
Spain %; Prioritization	20%; **(L)**
Greece %; Prioritization	20%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	20
Issue	Go to cinema
Spain %; Prioritization	15%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	21
Issue	Exchanging books/magazines
Spain %; Prioritization	10%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	22
Issue	Physical activity
Spain %; Prioritization	40%; **(M)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(M)**
User requirements	

Number	23
Issue	Play cards/chess
Spain %; Prioritization	20%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	24
Issue	Go to museum
Spain %; Prioritization	30%; **(M)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(M)**
User requirements	

Number	25

Issue	Go to concert
Spain %; Prioritization	30%; **(M)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(M)**
User requirements	

Number	26
Issue	Travel
Spain %; Prioritization	65%; **(M)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(M)**
User requirements	

PERCEPTUAL ABILITIES

Number	27
Issue	Can not recognize a person to a distance of four meters
Spain %; Prioritization	5%; **(L)**
Greece %; Prioritization	30%; **(M)**
Final Prioritization	**(M)**
User requirements	The PeerAssist screen (letter size, icons size) should be a large enough

Number	28
Issue	Can not recognize a person to a distance of one meter
Spain %; Prioritization	10%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	29
Issue	Use headphones to improve hearing
Spain %; Prioritization	0%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	30
Issue	Can not hear a TV at a level that consider standard
Spain %; Prioritization	30%; **(M)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(M)**
User requirements	The PeerAssist system must accommodate to different hearing levels of users

Number	31
Issue	Degenerative osteoarthritis problems
Spain %; Prioritization	20%; **(L)**
Greece %; Prioritization	15%; **(L)**
Final Prioritization	**(L)**
User requirements	There is no motor symptomatology, but it is necessary to control and watch the sensitivity of the touch display. In addition, the touch display is not a common type of screen between the users and their close family and friends (*I.58, *I.59, *I.61, *I.62, *I.71, *I.72, *I.82, *I.83).

Number	32
Issue	Arthritis problems
Spain %; Prioritization	15%; **(L)**
Greece %; Prioritization	15%; **(L)**
Final Prioritization	**(L)**
User requirements	There is no motor symptomatology, but it is necessary to control and watch the sensitivity of the touch display. In addition, the touch display is not a common type of screen between the users and their close family and friends (*I.58, *I.59, *I.61, *I.62, *I.71, *I.72, *I.82, *I.83).

Number	33
Issue	Difficulties to remember the name of a person it has just been introduced

Spain %; Prioritization	45%; **(M)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(M)**
User requirements	During all times, the system offers the name of the person with whom he/she is interacting (e.g. a little screen with the name of the person)

Number	34
Issue	Difficulties to remember data from article have recently read
Spain %; Prioritization	25%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	35
Issue	Difficulties to remember to switch off the lights, ...
Spain %; Prioritization	15%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	36

Issue	Difficulties to intend to take something as a house before going out
Spain %; Prioritization	10%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	37
Issue	Difficulties to remember a house address that you were told a few minutes before
Spain %; Prioritization	20%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	38
Issue	Describe their memory as bad comparing to the rest of society
Spain %; Prioritization	20%; **(L)**
Greece %; Prioritization	30%; **(M)**
Final Prioritization	**(M)**
User requirements	I* 38/ I* 39 Whenever the user performs an activity in which he/she uses memory and completes the activity correctly, the system must provide an enhancement

Number	39
Issue	Describe their memory as bad comparing it with the highest capacity he/she got in the past
Spain %; Prioritization	25%; **(L)**
Greece %; Prioritization	55%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	40
Issue	Describe their sped ability to process new information as bad
Spain %; Prioritization	5%; **(L)**
Greece %; Prioritization	45%; **(M)**
Final Prioritization	**(M)**
User requirements	I* 34/ I* 37/ I* 40 The system should repeat the information as often as necessary. The information offered by the system must be clear and should offer it up slowly. **Personal assistant is an important element of the system. Will need to spend time to properly design the main features of the wizard.

USES OF PC

To-be-developed functionalities in order to respect the previously used ones by the users. Will PeerAssist address the current uses? (YES/NO)

Number	41
Issue	Search for information
Spain %; Prioritization	55%; **(H)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(H)**
User requirements	Yes

Number	42
Issue	Chat
Spain %; Prioritization	20%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	No

Number	43
Issue	Facebook
Spain %; Prioritization	5%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	No

Number	44
Issue	Check e-mail
Spain %; Prioritization	40%; **(M)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(M)**
User requirements	Yes

Number	45
Issue	Read digital newspapers/books
Spain %; Prioritization	50%; **(M)**
Greece %; Prioritization	20%; **(L)**
Final Prioritization	**(M)**
User requirements	Yes

Number	46
Issue	Watch film
Spain %; Prioritization	15%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	No

Number	47
Issue	Play video games
Spain %; Prioritization	15%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	No

Number	48
Issue	Work
Spain %; Prioritization	20%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	No

Number	49
Issue	Wish of meet new people or to talk with relatives via Internet
Spain %; Prioritization	65%; **(H)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(H)**
User requirements	Yes

INTERACTION WITH TECHNOLOGIES (USERS)

Number	50
Issue	Never use mouse
Spain %; Prioritization	55%; **(H)**
Greece %; Prioritization	75%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	51
Issue	Never use Web cam
Spain %; Prioritization	90%; **(H)**
Greece %; Prioritization	95% **(H)**
Final Prioritization	**(H)**
User requirements	Think of a simple integration for the webcam

Number	52
Issue	Never use Keyboard
Spain %; Prioritization	50%; **(M)**
Greece %; Prioritization	80%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	53
Issue	Never use Headphones
Spain %; Prioritization	50%; **(M)**
Greece %; Prioritization	80%; **(H)**
Final Prioritization	**(H)**
User requirements	Think of a simple integration for headphones

Number	54
Issue	Never use Microphone
Spain %; Prioritization	80%; **(H)**
Greece %; Prioritization	100%; **(H)**
Final Prioritization	**(H)**
User requirements	Think of a simple integration for microphone

Number	55
Issue	Never use TV
Spain %; Prioritization	0%; **(L)**
Greece %; Prioritization	5%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	56
Issue	Never use CD Player
Spain %; Prioritization	30%; **(M)**
Greece %; Prioritization	20%; **(L)**
Final Prioritization	**(M)**
User requirements	

Number	57
Issue	Never use Mobile
Spain %; Prioritization	0%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	58
Issue	Never use Big touch screen
Spain %; Prioritization	100%; **(H)**
Greece %; Prioritization	100%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	59
Issue	Never use Small touch screen
Spain %; Prioritization	70%; **(H)**
Greece %; Prioritization	100%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	60
Issue	Never use Speech recognition
Spain %; Prioritization	100%; **(H)**
Greece %; Prioritization	100%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	61
Issue	Difficulties to use a touch screen
Spain %; Prioritization	45%; **(M)**
Greece %; Prioritization	
Final Prioritization	**(M)**
User requirements	

Number	62

Issue	The use of touch screen is uncomfortable
Spain %; Prioritization	35%; **(M)**
Greece %; Prioritization	
Final Prioritization	**(M)**
User requirements	(*I.52, *I.58, *I. 59, *I.61,*I.62) Remote control with a touch screen. For some of them is uncomfortable to touch directly the screen and they do not like the idea of stand up constantly to use the system. The use of speech recognition it could be a good solution, but this type of technology is not very common between the users (*I.60, *I.73, *I.84)

INTERACTION WITH TECHNOLOGIES (RELATIVES)

Number	63
Issue	Mouse
Spain %; Prioritization	75%; **(H)**
Greece %; Prioritization	100%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	64
Issue	Webcam
Spain %; Prioritization	55%; **(H)**
Greece %; Prioritization	0%; **(L)**

Final Prioritization	**(H)**
User requirements	Think of a simple integration for the webcam

Number	65
Issue	Keyboard
Spain %; Prioritization	70%; **(H)**
Greece %; Prioritization	90%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	66
Issue	Headphones
Spain %; Prioritization	50% **(M)**
Greece %; Prioritization	5%; **(L)**
Final Prioritization	**(M)**
User requirements	Think of a simple integration for headphones

Number	67
Issue	Microphone
Spain %; Prioritization	40%; **(M)**
Greece %; Prioritization	0%; **(L)**

Final Prioritization	**(M)**
User requirements	Think of a simple integration for microphone

Number	68
Issue	TV
Spain %; Prioritization	95%; **(H)**
Greece %; Prioritization	95%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	69
Issue	CD Player
Spain %; Prioritization	50%; **(M)**
Greece %; Prioritization	95%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	70
Issue	Mobile
Spain %; Prioritization	70%; **(H)**
Greece %; Prioritization	100%; **(H)**

Final Prioritization	**(H)**
User requirements	

Number	71
Issue	Big touch screen
Spain %; Prioritization	5%; **(L)**
Greece %; Prioritization	0% **(L)**
Final Prioritization	**(L)**
User requirements	

Number	72
Issue	Small touch screen
Spain %; Prioritization	30%; **(M)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(M)**
User requirements	

Number	73
Issue	Never use Speech recognition
Spain %; Prioritization	100%; **(H)**
Greece %; Prioritization	100%; **(H)**

Final Prioritization	**(H)**
User requirements	

INTERACTION WITH TECHNOLOGIES (FRIENDS)

Number	74
Issue	Mouse
Spain %; Prioritization	45%; **(M)**
Greece %; Prioritization	100%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	75
Issue	Webcam
Spain %; Prioritization	25%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	Think of a simple integration for the webcam

Number	76
Issue	Keyboard
Spain %; Prioritization	35%; **(M)**

Greece %; Prioritization	90%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	77
Issue	Headphones
Spain %; Prioritization	25%; **(L)**
Greece %; Prioritization	5%; **(L)**
Final Prioritization	**(L)**
User requirements	Think of a simple integration for headphones

Number	78
Issue	Microphone
Spain %; Prioritization	15%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	Think of a simple integration for microphone

Number	79
Issue	TV
Spain %; Prioritization	95%; **(H)**
Greece %; Prioritization	95%; **(H)**

Final Prioritization	**(H)**
User requirements	

Number	80
Issue	CD Player
Spain %; Prioritization	45%; **(M)**
Greece %; Prioritization	95%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	81
Issue	Mobile
Spain %; Prioritization	70%; **(H)**
Greece %; Prioritization	100%; **(H)**
Final Prioritization	**(H)**
User requirements	

Number	82
Issue	Big touch screen
Spain %; Prioritization	5%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	83
Issue	Small touch screen
Spain %; Prioritization	10%; **(L)**
Greece %; Prioritization	0%; **(L)**
Final Prioritization	**(L)**
User requirements	

Number	84
Issue	Never use Speech recognition
Spain %; Prioritization	100%; **(H)**
Greece %; Prioritization	100%; **(H)**
Final Prioritization	**(H)**
User requirements	

4. Use cases

4.1.Introduction

The present section presents specific use cases that will set the route for technical development within the project. Specifically, for each use case we present the goal of the use case, actors, per- and post-conditions, description of the use case and notes. We complete the use cases with examples based on the information from the interviews and its main objectives.

With this section, we try to establish a connection between users' data and requirements the PeerAssist platform has to fulfill. Use cases are expressed as individual named items with a set of fields. They describe how the system is used to perform a specific task, and how it must behave.

Use cases are vertical, i.e. they describe functions from the user's point of view, which involve all layers. They treat the system as a black box, so they don't attempt to describe the architecture. On the other hand, requirements (D2.3) will detail the system's features by referring to specific layers, e.g. define UI features, network capabilities, etc. The following “aspects” are just a way of grouping use cases in general topics, roughly the types of features PeerAssist will offer. This separation is made for the sake of clarity, as it is meaningful for a non-technical user. Some use cases may be technically similar to others in different categories, but this is not considered in this phase. The “aspects” classification is the following:

- **Social interaction:** all actions related to communities among people, with the main purpose of communication.
- **Services:** actions related to offering and consuming of services.
- **Content access:** actions about delivering and accessing content.
- **Care giving:** provisioning of services related to health and safety.
- **General:** other basic functions of the system.

The “Actors” are the roles of the entities (usually humans) who interact with the system. The roles are only defined by the actions they are allowed to do. For example, a Service Provider is anyone who can offer a service. These roles are not mutually exclusive, any given person can potentially play several roles (e.g. be an elder user and a volunteer caregiver). When a user assumes a role, he is granted permissions to do special actions.

The category “User” is a common term that includes all other roles. Use cases may refer to User as the actor if the action is available to everyone, or specify a more concrete role to restrict who is allowed to do it. The “user” classification is the following:

- **End user:** an elderly person, the primary user of the system
- **Care giver:** a person who provides care services to the elderly. It can be a paid professional or a private individual (e.g. family member, relative, friend, volunteer).
- **Medical personnel:** A professional who can deliver medical services (e.g. doctor, nurse).
- **Service provider:** A person, company or institution who offers general services, free or paid (e.g. housekeeping, transport, delivery of goods).
- **Social organization:** An institution that organizes events or activities of social interest.
- **Operator:** An technical administrator who manages and maintains the system.

4.2. Use cases summary

- Social interaction
    - Search users
    - Communicate with users
    - Create a group
    - Search a group
    - Join a group
    - Delete a group
    - Do an online activity
    - Organize an event
- Services
    - Publish a service
    - Advertise a service
    - Search services
    - Rate a service or service provider
- Content access
    - Search content
    - Publish content
    - Get suggestions
    - Advertise an event
- Care giving
    - Add an authorized caregiver
    - Do monitored tasks
    - Raise an alarm
    - Consult a doctor
- General
    - Manage the personal profile
    - Manage contacts
    - Get help from Personal Assistant

4.3. Use cases list

4.3.1. Social interaction

Search users

USE CASE	**Search users**
Goal	The user wants to find other users in the platform.
Actors	User
Preconditions	There are other users with profiles in the platform.
Post conditions	The user is presented with some users that match his/her search.
Description	1. The user enters his/her search constraints. 2. The system returns a set of matching users, ordered by semantic relevance. Then s/he can do something with them (view their details, add them to contacts, make a private group…).
Notes	This feature can be used to meet new people or to find a known person. The available search options and matching criteria are yet to be specified.

Examples:

- Alice wants to find peers that share a common interest, for example interested in crime novels. Depending on the search parameters, the system returns information about the peers sharing the same interest.
- Bob wants to find peers having a certain disease (for example B himself has diabetes, and is interested in exchanging receipts with other users with the same diet restrictions). Once the system returns the results, B can contact the peers he wants to communicate with.

USE CASE	**Communicate with users**
Goal	The user wants to communicate with other users through a specific

	communication channel.
Actors	Users
Preconditions	There are other users in the platform.
Post conditions	The user exchanges information with other partners.
Description	1. The user selects one partner (one-to-one dialog), several partners or a whole group (group dialog). 2. The involved users exchange information according to the nature of the channel.
Notes	Communication can be performed in a variety of contexts: within members of a group, event attendants, friends and family, private contacts, etc. Available communication channels must be selected. Candidates are Mail, Chat, Forums, Phone/Video call, Photo sharing…

Examples:

- Charlie feels sick and needs a medicine. He sends a private message to his daughter, or talks to her, to ask her to buy the item. He selects the daughter from his contact list.
- Dennis notices that all his three children are online and decides to talk to them through the platform. He initiates a voice communication with them to ask about their news. A “Skype type” voice call is executed among the peers.
- Ed has a predefined group of his soccer friends. On Monday evening, he initiates a text-based chat communication with the group to discuss about the Sunday match of their favorite team. Again, a “Skype type” chatting is executed among the peers.

USE CASE	**Create a group**
Goal	The user wants to form a group of people with the purpose of communicating between them or performing some joint action.
Actors	Users
Preconditions	There are some other users in the network, with a public profile that shows their interests.

Post conditions	A group is built with all users who agreed to join it.
Description	1. The user enters a request to make a group, indicating a topic or some basic information. 2a. [open group] The system finds matching people who receive an invitation. They answer whether they want to join. 2b. [closed group] The user selects the target partners. They get an invitation and answer it. 3. All users who respond positively become members of the new group. Then they can communicate between them.
Notes	When the group is open, it can be found in searches and other people may request to join it.

Examples:

- In the forthcoming days there is an art exhibition at the metropolitan museum and Nikos, a former art critic, wants to create a group of people that are interested in modern painting, in order to exchange ideas and create a forum discussing and criticizing the exhibition.
    - Nikos pushes an advertisement to the PeerAssist platform about his intention of creating a group with the above mentioned goal.
    - The system finds candidate group members based on their public profile and sends them invitations.
    - Some of the invited members accept the invitation and join into the group.
    - It is an open group where anyone (invited or not by the system) that is interested in the group's subject can join.
    - Nikos noticed that within the group there are two ex-colleague of him.
    - He creates another private group and asks from them to join in order to comment the others ideas and opinions privately.
    - A month after the event Nikos has closed the public discussion group that was idle, but kept the private one with his ex-colleges.

USE CASE	**Search a group**
Goal	The user wants to find a Group to see its details, and possibly join it to interact with its members.
Actors	User

Preconditions	Some Groups exist in the platform.
Postconditions	The user finds a suitable Group which he can join.
Description	1. The user enters some search criteria (topic, location, type of community…). 2. A (possibly empty) set of matching existing groups is presented. They are found and ranked based on the user's profile and context. 3. The user can then select any of them to view its details and operate on it.
Notes	The available search options and matching criteria are yet to be specified.

Examples:

- Alice wants to find a Group interested in playing on-line remi. If such groups exist, the system will return the details in random order.
- Bob wants to find a Group interested in long walks in the nature. If such groups exist, the system will return the details ordered by proximity.

USE CASE	**Join a group**
Goal	The user wants to become a member of a Group to interact with its members.
Actors	User
Preconditions	The user has selected a Group.
Postconditions	The user is a new member of the Group.
Description	1. The user enters a request to join the group. 2. The Group administrator is notified and decides if s/he approves the request. Alternatively, the approval may be automatic. 3. The acceptance is notified to the requester user and s/he becomes a member.
Notes	The Groups can be configured to allow free membership or to require explicit approval by an administrator. The act of joining a group can be

	done by a user who found the group on a search, or by a user who received an invitation. The option of leaving the group is always available.

Examples:

- Fred has just found a group to practice English. The group is open to anyone, so he requests to join it and he is instantly accepted. Then he can enter the chat room to talk with others.
- George turns on his PeerAssist device and notices he has an unread notification. According to the message, he has been selected to join a newly created discussion group about cinema, because he is interested in that topic. It sounds good to him, so he clicks on the link and is presented with all the group's information. He decides to accept the invitation, so he becomes a member.

USE CASE	**Delete a group**
Goal	The user wants to cancel a Group so it is no longer available.
Actors	User
Preconditions	The user is the creator or owner of the group.
Postconditions	The group is removed, all its members lose their membership.
Description	1. The user requests deletion of the group. 2. The group is destroyed and all its members are notified.
Notes	It is assumed that the owner has total ownership rights on the group. In some cases a group can be automatically destroyed, i.e. when an Event or Online Activity is completed.

Examples:

- Henry, who created a group for an activity, destroys that group when no-longer active.
- The system destroys a group that has expired or has no members.

USE CASE	**Do an online activity**

Goal	The user wants to perform an Online Activity with other people.
Actors	Users
Preconditions	The user is a member of a Group, or is able to make one. There are other members online.
Postconditions	The Activity is performed by the participants.
Description	1. The user sets up a new Online Activity, indicating the type, duration and other relevant data. 2. If necessary, a new group is created and invitations are sent to potentially interested (or selected) people. 3. The Activity is started, other members can enter to participate on it. 4. They perform the Activity together.
Notes	The Online Activities are leisure actions that can be done within the network, involve several people, and have a short lifespan. They can be immediate or scheduled for a close future. These may include chat sessions, games (cards, strategy…), joint media playing (watching movies/sports in group), etc. The system will make a group to support the activity, if it doesn't exist already.

Examples:

- Alice wants to talk with people, right now, about nothing in particular. She doesn't want to start a durable thematic group, nor search an existing one, just chat. She accepts strangers, but prefers people with similar interests. So, she requests to start a chat session with a limited amount of matching people, which get invited to a new ad-hoc group.
- Bob wants to watch a football match tonight while commenting it with others. He selects some friends, supporters of his favorite team, and starts a phone conference with them in a new group. The system finds a video streaming service that delivers them the live match.
- Susan likes poetry. She wants to organize an online activity where she and others read and then discuss poems of Odysseas Elytis. Her friend Mara cannot speak and move very well but she can still join the group and participate with the assistance of a trusted caregiver.

USE CASE	**Organize an event**
Goal	The user wants to organize a social event, and wants to gather interested people.
Actors	Users
Preconditions	The user is a member of a Group, or is able to make one. There are other users in the platform.
Postconditions	The Event is set up and its planification is done between the interested people.
Description	1. The user creates an Event, indicating all relevant data (type, starting time, duration, etc.). 2. If necessary, a new group is created and invitations are sent to potentially interested (or selected) people. 3. The Event is set up, then the group members can do organization tasks (fix the place and time, arrange transportation, etc.).
Notes	Events are acts that take place in the physical world, involve several people, and are planned in advance. The system makes groups to support the organization of events. Several options may be available, like cancelling the event, un-registering, etc.

Examples:

- Alice: wants to invite people to her home for a social event, so she requests the creation of a new event, also specifying the place and time. She may invite the same people invited in previous social events; additionally she may search and select people not previously invited or contacted. After she has selected the people to invite she decides to send the invitations. After the event is organized, she waits for people having accepted the invitation and replies to any questions from the people invited.
- Bob is one of the people invited in the event from Alice. Bob receives the invitation and sees the time, location and the other people invited. He accepts the invitation and then he sees that Susan, who leaves nearby, is also invited, so he decides to send her a message or call her to arrange mutual transportation. Bob is notified for the upcoming event two hours before the event.

4.3.2. Services

USE CASE	**Publish a service**
Goal	The service provider wants to publish a service on the PeerAssist platform.
Actors	Service provider
Preconditions	The service provider should be authorized to publish services.
Postconditions	The service description is available and stored in a repository.
Description	1. The service provider enters the service description (type, expiration, …). 2. The service provider submits it and the system makes the service available.
Notes	The service provider may be a 3rd party or a common user. The process of service publishing may be different in each case.

Examples:

- Alice plans to go to a concert by car. She has four seats left and offers transportation to the concert venue as a service to other users. The availability of the service is limited to the hours directly before the concert.
- Clean Inc. is a cleaning company that wants to offer their services to the users of PeerAssist. They describe an offer for cleaning services on weekdays for 15€/hour and publish it on the PeerAssist platform.

USE CASE	**Advertise a service**
Goal	The service provider wants to advertise a service.
Actors	Service provider
Preconditions	The service provider should be authorized to advertise services. The service is already published.
Postconditions	Advertisements are received by the users that accept advertisements.

Description	1. The service provider defines a target group and sends the advertisement. 2. The user receives the advertisements s/he is interested in based on filtering criteria.
Notes	

Examples:

- An adult education center has published an offering of an English language course on the PeerAssist platform. A week before the course starts, there are still some places available, so the education center decides to send an advertisement to interested PeerAssist users.
- Bob is a retired music teacher. He publishes an offer for guitar lessons as a service on the PeerAssist platform and chooses to advertise it to PeerAssist users interested in music.

USE CASE	**Search services**
Goal	The user needs to find relevant services.
Actors	User, Service providers
Preconditions	There are services available in the platform.
Postconditions	The user finds the service required (either from a peer or from a 3rd party).
Description	1. User needs a particular service. 2. The request is sent to the service repository to check if such a service is offered by a user or a company. 3. The repository returns a (possibly empty) set of services. 4. The user decides which one to choose and sends a booking request to the provider. 5. The provider decides whether to accept the request or not and notifies the user accordingly.
Notes	

Examples:

- John wants transportation to a particular event, he may decide to use a taxi or get a lift with a peer. The taxi company will definitely provide the service (it's reliable but costly), whereas the peer may not do it depending on its own availability, mood, seriousness. Since it is an important ride, he chooses the taxi company and he orders a taxi for that date.
- Karl wants to find somebody that provides cleaning services. As in the previous case, it can be a cleaning company or a peer that provides this service.

USE CASE	**Rate a service or service provider**
Goal	The user wants to give a rating to a service or provider to express his perceived quality.
Actors	User
Preconditions	The user should have used the service or service provider.
Postconditions	The system records the user's rating for the service or service provider.
Description	1. The user selects the service or service provider. 2. The user enters his rating.
Notes	The option to rate service providers can be particularly useful for temporary offers, so that users can rate the service provider instead of the temporary service that might not be visible any more. The average rating can be displayed in the description of the service. This reputation data can also be used for service discovery and selection. The format and process of rating will be further specified.

Examples:

- Eve has ordered the services of a cleaning company, but was not satisfied with the results. She selects the service on the PeerAssist platform and enters a negative rating.
- Charlie shared a car ride to a concert with Alice, who had offered this transportation as a service on the PeerAssist platform. He found it to be a pleasant ride and would recommend it to his friends, so he decides to enter a positive rating.

4.3.3. Content access

USE CASE	**Search content**
Goal	The user wants to find and access some content in the platform.
Actors	User
Preconditions	There is some content in the platform, published by some user.
Postconditions	The user consumes the content (read/watch/listen).
Description	1. User places a request for content, expressing some constraints (topic, format…). 2. The system returns links to relevant results. 3. The user selects one and consumes it.
Notes	“Content” means any kind of available information: news, articles, images, videos, etc.

Examples:

- Alice wants to find more information about a hobby of her, for example patterns for knitting. The system will return the names of the relevant documents, and the user can select what she wants to read.
- Pedro wants to read information about the current strikes in Greece, but he only speaks Spanish and has no access to newspapers. If any of the peers have posted a document abut this in Spanish during the last 24 hours, B is displayed with the results. If there are only older postings, B is informed about this.

USE CASE	**Publish content**
Goal	The actor wants to make some content available to the public.
Actors	User/Operator/Service provider
Preconditions	The actor is authorized to publish content in a specific space.
Postconditions	The content is published.
Description	1. The actor accesses the publishing interface for the desired space.

	2. He enters the data and submits it.
Notes	The “space” is any place in the platform where publication is allowed:s company pages, personal blogs, news feeds, etc.

Examples:

- Bob was very satisfied with the services of Clean Inc. In addition to entering a positive rating, he decides to publish a positive comment. He navigates to the company page of Clean Inc. and enters the comment.
- Katharine just finished reading the all-time classic “Pride and Prejudice” and wants to share her experience by publishing a review. She accesses her personal page on the PeerAssist platform and enters a new blog post about the book.

USE CASE	**Get suggestions**
Goal	The system offers the user recommendations about entities of the PeerAssist platform, e.g. content items, peers, groups, etc.
Actors	User
Preconditions	The user has a search history and/or declared interests in his/her user profile.
Postconditions	The user is presented with suggestions about relevant items.
Description	1. Based on declared interests and observed usage patterns, the system finds and shows items that match the user.
Notes	This “Suggestions” feature may apply to Peers, Services, Groups, or other entities of the platform.

Examples:

- Mallory has declared an interest for romantic movies in her user profile. PeerAssist suggests her to join a local movie discussion group.
- Bob knows Katharine and Alice, who both have interacted with Charlie. PeerAssist suggests Bob to get in contact with Charlie.

USE CASE	Advertise an event
Goal	A social organization wants to advertise an event so that users can make groups to attend it.
Actors	Social Organization (SO), User
Preconditions	The SO is authorized to advertise events. Users can be notified about an event.
Postconditions	Advertisements are received by the users that accept event notifications.
Description	1. The SO describes an event (place, time, type, accessibility, …). 2. The user receives the advertisements he/she is interested in based on filtering criteria (possibly based on a user's public profile). 3. The user can either accept or reject his/her participation to the advertised event.
Notes	Users can be notified either by being subscribed to an Event Notification List or the SO notifies him/her for an upcoming event. The user should be able to create an event group based on this advertisement upon acceptance of it, through the “Organize an Event” Use Case.

Examples:

- Alice has been registered to a SO for being notified about events related to literature. The SO creates and advertises a similar event (e.g., Next Monday, a literature talk on poetry will be held in the National Museum of Moden Arts.) to an Event Notification List. Thus, Alice is being notified upon the upcoming event.
    - Alice accepts such event, so she makes an event group and invites similarly interested peers.

4.3.4. Care giving

USE CASE	Add an authorized caregiver
Goal	The user needs to have a specific person as a trusted authorized caregiver.

Actors	User, Caregiver or Social organization
Preconditions	The actor knows some people who are able to become trusted caregivers (e.g. social workers or the user's relatives/friends).
Postconditions	A caregiver is added to the circle of caregivers for the user.
Description	1. The actor selects a caregiver and specifies the types of activities s/he may help with. 2. The caregiver receives a request with some specifics. 3. S/he answers whether s/he agrees to join the circle of user's caregivers. 4. If s/he accepts the role, the user is notified.
Notes	The caregiver may be chosen by the user or assigned by a social or health organization. Even the caregiver may have authority to add him/herself to a user's circle. The actor may want to establish “grades” of trusted care giving to make the role more manageable.

Examples:

- Charlie has a daughter who lives somewhere else and usually takes care of him. He obviously trusts her, so he grants her the role of caregiver in his circle. This way she will be able to deliver care support through the platform when he needs it, e.g. with monitored tasks.
- John participates in the PeerAssist network but he doesn't know any person who can deliver care services. A Social organization in his city assigns him a professional caregiver, who may be in charge of several people.

USE CASE	**Do monitored tasks**
Goal	The user must perform some real-world tasks that should be monitored.
Actors	User, Trusted Caregivers
Preconditions	There are some caregivers authorized by the user to participate in a monitoring task.
Postconditions	The monitored task is set up, so the user is ready to perform it with the supervision of authorized caregivers.

Description	1. The user (or his/her trusted caregiver) enters a request for defining a monitored task. 2. The rest of participants (the user or other caregivers) are notified. They answer whether they accept to participate. 3. All participants who do become members of the group. At least the user and one caregiver must accept. 4. At the specified time the monitoring of the task starts, using the appropriate devices when necessary. 5. If something goes wrong (bad events are observed, or monitoring fails) the caregivers are alerted.
Notes	The monitored task may be a single temporary activity (e.g. a risky operation) or a permanent continuous task (e.g. a daily schedule). The time span and monitoring actions can be configured. The degree of observation may range from simple messages to transmission of audio/video or medical data. The caregivers can be notified when the user fails to send a specific voice message or send a text message every x hours during the monitored activity.

Examples:

- Karl needs to give himself an insulin injection, but he's not confident enough. He requests someone to provide advice and supervise the operation. One of his authorized caregivers with medical knowledge responds to the request. Then a video-conference is started so the caregiver can oversee the process.
- George lives alone. His doctor prescribes him a medication schedule. His authorized caregiver issues a monitored task to keep track of it, so he configures that schedule. The user is notified and accepts the monitoring, so they both get in a group. From then on, at some hours of the day the system rings and shows a message reminding him to take the pills. He takes them and acknowledges it. In case he doesn't confirm it after some time, the caregiver is alerted and personally contacts the user through the system or by phone.

USE CASE	**Raise an alarm**
Goal	The user needs to get help in an emergency situation
Actors	User, Trusted Care givers
Preconditions	The user has enabled the alarm system, there are some care givers

	ready to respond
Postconditions	The caregiver receives an urgent notification
Description	1. The user is in trouble, he sends a signal in some way, which triggers the alarm. 2. The caregiver is notified immediately, so he can start appropriate actions.
Notes	The user's trigger signal must be available when he's not using the normal interface. It could be a voice message, a button in a portable device, etc.

Examples:

- Bob does not feel well and wants to call for help. The phone is away, so he triggers an alarm either by pressing a remote button he carries or saying help on a microphone nearby. Bob is notified that the caregiver has been contacted and on his way.
    - The caregiver is notified about Bob's situation and notifies that he is on his way to Bob's home.
    - The caregiver checks for video available in Bob's home and tries to see if he has visual contact with him.
    - The caregiver tries to contact Bob through the phone and additionally calls for help.

USE CASE	**Consult a doctor**
Goal	The user has a medical problem or doubt and s/he wants to talk with his/her doctor to ask for advice.
Actors	User, doctor
Preconditions	The user has one or more doctors assigned, they can use a platform device at their office.
Postconditions	The user and the doctor communicate to solve the problem.
Description	1. The user makes a request for a medical consultation. 2. The doctor is notified, he can choose to accept the request and make

	an appointment. 3. If he agrees, the session will start at the specified time.
Notes	Several authorized doctors may be eligible if the preferred one is busy, and the user should be allowed to choose. Appropriate communication channels would be phone or video conference.

Examples:

- Fred has a rash on his arm and does not know how to treat it. He requests a consultation with his usual trusted doctor. Since the doctor's schedule is full until some hours later, the system proposes the user an appointment for that hour. He accepts it and the appointment is scheduled. When the time comes, both the doctor and the user get a reminder, and a video conference starts. The doctor is then able to remotely inspect the rash and prescribe an ointment.
- Katharine has a headache and intends to take some pills, but she has doubts about possible side effects. She requests a consultation with a doctor. Several available authorized doctors are presented for appointments at different times. Since she is not looking for anyone in particular, she chooses the one with sooner availability. The consultation does not require video communication, so a phone conference is started at the specified time. Then the doctor explains the pills' side effects and provides advice.

4.3.5. General

USE CASE	**Manage the personal profile**
Goal	The user wants to edit the information in his profile.
Actors	User
Preconditions	The user has an existing (possibly blank) profile.
Postconditions	The profile is updated.
Description	1. The user requests the system to view his profile. 2. The user requests the system to edit his profile. 3. He modifies his static data (personal details, interests…). 4. He saves the changes.
Notes	The stored information will be specified on subsequent stages (name,

	age, sex, address, interests?).

Examples:

- Bob has moved to a new address and wants to change his address information.
- Bob wants to add a new interest.

USE CASE	**Manage contacts**
Goal	The user wants to organize his contact list.
Actors	User
Preconditions	The user has a (possibly empty) contact list.
Postconditions	The contact list is updated.
Description	1. The user can see his contacts, add or delete any of them.
Notes	These actions may be done from several contexts (e.g. add peers from a search result or a group member list). Every member's name that represents a peer can be a link to add this member as a contact, if he is not already in the contact list of the user. The user can delete a contact from the list, by pressing an icon next to the contact name. Design comment: this information will be semantically represented, linked to the profile and used in matching.

Examples:

- Bob wants to see his contacts. He requests the existing contacts and gets a list with name and optional image.
- Bob wants to add a new contact. He searches by names and chooses the proper result, based on additional information (e.g. location). He adds the user to his contacts.

USE CASE	**Get help from Personal Assistant**
Goal	The user wants to perform a task with some assistance.

Actors	User
Preconditions	The PA has knowledge about the user and context.
Postconditions	The task is done.
Description	1. The user enables the PA in the system. 2a. The PA interacts with the user, showing him what to do by giving directions or asking questions. 2b. The PA handles part of the work, relieving the user from complex UI interaction. 3. When the task is finished, the PA gives positive feedback.
Notes	The PA is able to act on user's behalf, both under request and autonomously. The PA UI can be pictured in several forms: a character, a wizard, or a sequence of voice/on-screen messages.

Examples:

- Dennis wants to make a group to discuss about cinema. Instead of using the regular UI, he starts interacting with the PA, which appears as a character displaying text messages on screen. The PA makes questions to find out the user intent (what he wants to make, what kind of group…). Then the PA helps him to make a query (select a group topic, define constraints for eligible members…). Finally the group is made and the PA provides directions to perform actions on it (invite more people, start a chat, leave…).

USE CASE	**Use PeerAssist through an ubiquitous interface**
Goal	The user wants to use the system in non-PC environments.
Actors	User
Preconditions	The user has an appropriate device for his/her situation.
Postconditions	The user has been able to perform the intended task.
Description	1. The user opens the application on his/her user device. 2. The user manages the system through a special interface, especially adapted for each concrete device.

Notes	The proposed non-PC devices are: a TV set, a touch screen (tablet or smartphone), and a speech interface (headset or telephone).

Examples:

- John has arranged a meeting with some friends by creating an event community. On the meeting date he is on the street, and he wants to check again the list of attendants. By using his smartphone he access his account and navigates through the system's special UI until he finds the event information.
- Eve has severe visual impairments and she is not able to use a screen at all. She takes his home telephone and dials a single dedicated button which connects to the home device and initiates a voice conversation with the PA. By answering simple questions and entering data, she is able to perform the intended task.

5. Implications for PeerAssist Platform

After consideration the evaluations with the users, we point to the following as some of the most remarkable conclusions from the user requirements stage:

	Facts	**Implications**
1	The population of the older adults is very heterogeneous.	PeerAssist platform system must be flexible and adaptable to different elderly people’s needs and interests.
2	Older adults do not want a complicated device because it could be one of the first barriers to use the PeerAssist platform.	PeerAssist terminal must be easy to use and as similar as possible to the technology they use daily.
3	Many users are reluctant to any technology that aims to reduce their levels of familiar and social interactions.	The PeerAssist platform must be sufficiently novel and attractive to users that intend to use it.
4	Some user are not willing to use the platform under no circumstances.	The PeerAssist platform must provide attractive facilities for users to

		encourage them to use it to use (for example: education, games, etc.).
5	Sometimes the attitude of elderly people towards technology use is negative because it seems complex.	The platform must be motivating for the users. In addition, the device must have a system reinforcement to enhance the users when they use the platform correctly.
6	For some elderly people it is difficult to imagine how technology can help them. For this reason, they are a bit reluctant to the various kinds of terminal devices. They assume that, in a few years time, next generation of elderly will tend to integrate this kind of device more easily.	This generation's elderly people cannot imagine technology until they have it in their hands and can actually use it, as it is shown by the extended use of mobile phones among the elderly. We have to be sure that by the time a prototype is developed and they can manage it physically, the reluctance will decrease.
7	Some users evaluate positively the idea of meeting new people, but they are afraid of the idea of trusting a stranger.	Increased security and a sense of safety is required from the platform.
8	In general, all users are concerned with the personal information required for certain tasks.	It is necessary to raise successfully the security and confidentiality of the system.
9	The help offered by the personal assistant is very well accepted by users.	-Personal assistant is a key to positive acceptance of the system, therefore it is very important to work hard in developing it.

		-Any material (e.g. trainig material) to be developed in PeerAssist should be clear and easy to capture the attention of the users.

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Annex

Evaluation Plan

EVALUATION PLAN FOR PEERASSIST PROJECT

Index:

1. **Sociodemographic data**

1.1. Participant code #:

1.2. Sex: 1.3. Age:
1.4. Date of Birth: 1.5. Place of Birth:
1.6. Nationality: 1.7. Place of Residence:

1.8. Type of residence:

1. Own house
2. Supervised Housing
3. Geriatric Residence

1.9. Years living in the current location:

1.10. Highest academic degree: .....
(if they respond “no Studies”, ask them whether they know how to write and read)

1.11. Are you receiving formal education nowadays?
1. Yes. **2.** No

1.12. Main occupation during the latest working years:

1. 13. Occupational background (How many years have you worked)?

1.14. Marital Status:

1. single
2. married / living with a couple
3. widow
4. separated
5. divorced

1.15. Years of marriage (or living with a couple).:

1. none
2. Less than 5 years
3. Between 5 and 10 years
4. Between 10 and 20 years
5. Between 20 and 30 years
6. More than 30 years

1.16. Who do you live with

1.17. Number of children: 1.18. Number of children alive:

1.19. Number of children they keep contact with:

1.20. Number of grandchildren: 1.21. Number of grandgrandchildren:

1.22. Mother tongue:

1.23. Languages they know: 1.24. Language they normally use:

2. **Familiar situation**

2.1.How easy is for you to see your relatives "face-to-face"?

1. ▪ It is impossible for me to see them face-to-face
2. ▪ Very difficult
3. ▪ Difficult
4. ▪ Easy
5. ▪ Very easy

2.2.How far do your closest relatives live from you?

1. ▪ I do not have relatives
2. ▪ At a walking distance
3. ▪ I need to take urban transportation (or up to an hour)
4. ▪ I need to take interurban transportation (or one hour or more)
5. ▪ I need one day or more than one day to reach the place where they live

2.3.How is the relationship with the people you live with:

1. ▪ Non-existent (mark this for those who live alone)
2. ▪ Conflictive
3. ▪ Indifferent
4. ▪ Good
5. ▪ Very good
6. ▪ Excellent

2.4.During the last year, how often did you leave your home to visit relatives on weekends, meet them to go shopping or other daily life activities?

1. ▪ Never
2. ▪ Less than once a month
3. ▪ From 1 to 3 times a month
4. ▪ Once a week or more

2.5.During the last year, how often did you leave your home to visit relatives on holidays, in a trip, or other planned leisure activities?

1. ▪ Never
2. ▪ Less than once a month or only on holidays
3. ▪ From 1 to 3 times a month
4. ▪ Once a week or more

2.6.Do you meet your relatives as often as you would like to?

1. ▪ I never meet them
2. ▪ Sometimes I feel bad because they do not come by very often
3. ▪ Sometime I feel bad because they come very often
4. ▪ I feel happy even if they do not come very often
5. ▪ I feel happy because they come often
6. ▪ I feel happy because I meet them as many times as I want

2.7.How often do you speak to your relatives (by phone)?

1. ▪ Never
2. ▪ Once a week
3. ▪ Twice a week
4. ▪ Once a day or more

3. **Social relationships/interaction**

3.1. **Quality of social contacts:**

1. ▪ I do not go out of home and do not receive visits
2. ▪ I do not go out of home, but I receive relatives or visits
3. ▪ I go out of home, but I only relate to family.
4. ▪ I go out of home, but I only relate to family or neighbours.
5. ▪ I keep social relationships outside home.

3.2. How often do you meet people different from your relatives?

1. ▪ Never
2. ▪ Less than once a month or only on holidays
3. ▪ From 1 to 3 times a month
4. ▪ Once a week or more

3.3. **How many people do you feel confident enough to visit them at their homes?**

1. ▪ Nobody
2. ▪ One or two
3. ▪ Three or four
4. ▪ Five or more

3.4. How many times do you speak to friends (by phone)?

1. ▪ None
2. ▪ Once a week
3. ▪ Twice a week
4. ▪ Once a day or more

3.5. How often do you receive visits from your friends?

1. ▪ Never
2. ▪ Once a week
3. ▪ Twice to six times a week
4. ▪ Once a day or more

3.6.How is other people's availability in case you feel ill or disabled?

1. ▪ No person available; I am all by myself
2. ▪ I have somebody who would help me occasionally.
3. ▪ I have somebody who would take care of me only for a brief period of time.
4. ▪ I have somebody who could take care of me as long as I needed it.

3.7.How many people do you consider as "friends"?

1. ▪ Nobody
2. ▪ One or two
3. ▪ Three or more
4. ▪ Five or more

3.8.How many new friends have you made after retirement?

1. ▪ None
2. ▪ One or two
3. ▪ Three or four
4. ▪ Five or more

3.9.**How you consider your social relationships (in general) when compared to when you were younger?**

1. ▪ Non-existent
2. ▪ Significantly worse
3. ▪ Slightly worse
4. ▪ Similar
5. ▪ Slightly better
6. ▪ Significantly better

3.10.During the last year, how often did you leave your home to visit friends on weekends, meet them to go shopping or other daily life activities?

1. ▪ Never
2. ▪ Less than once a month or only on holidays
3. ▪ From 1 to 3 times a month

4. ▪ Once a week or more

3.11. During the last year, how often did you leave your home to visit friends on holidays, in a trip, or other planned leisure activities?

1. ▪ Never
2. ▪ Less than once a month or only on holidays
3. ▪ From 1 to 3 times a month
4. ▪ Once a week or more

3.12. What kind of activities do you mainly perform?

1. ▪ No activities
2. ▪ Passive tasks at home (watch TV)
3. ▪ Active tasks at home (from reading to craftwork)
4. ▪ Activities out of home

3.13. Where do you mainly focus your social relationships?

1. ▪ I do not have social relationships
2. ▪ I meet people “there and then” when I go out (on the street, in a bar, in the doctor’s)
3. ▪ I meet people at more structured places (civic centres, elders’ associations…)

4. Leisure activities

4.1. Do you agree with the free time you have available to meet people you know?

1.No, I would like to have more.

2.Yes, I agree

3.Don't know/ No answer

4.2. Would you like to have more free time for leisure?

1.No, I am OK with my leisure time

2.Yes, to some extent

3.Yes, a lot more

4. I do not have leisure time

Frequency of performance of various activities

Type of activities	Frequency			Do you think is			Have more time for:	
	Daily	Every week	Monthly	Little, not much	Enough	A lot	Yes	No
4.3.Gone out (bar) with relative/friends								
4.4.Go to the cinema								
4.5.Exchanging books/magazines								
4.6.Organizing social gathering/meals								
4.7.Physical activity								
4.8.Search information on the internet								
4.9.Play cards/ Play chess								
4.10.Go to museum								
4.11.Go to concert								
4.12.Travel								

4.13.Craftwork								
4.14.Smoke								

5. **Health questionnaire**

5.1.**In general, would you say your health is:**

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

The following two questions are about activities you might during a typical day. Does your health now limit you in these activities? If so, how much?

5.2.**Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or walk more than one hour:**

1. Yes, limited a lot
2. Yes, limited a little
3. No, not limited at all

5.3.**Climbing several flights of stairs:**

1. yes, limited a lot
2. Yes, limited a little
3. No, no limited at all

During the past 4 weeks have you had any of the following problems with your work or other activities as a result of your physical health?

5.4.**Accomplished less than you would like:**

1. Yes
2. No

5.5.**Were limited in the kind of work or other activities:**

1. Yes
2. No

During the past 4 weeks, were you limited in the kind of work you do or other regular activities as a result of any emotional problems (such as feeling depressed or anxious)?

5.6. **Accomplished less than you would like:**

1. Yes
2. No

5.7. **Didn´t work on other activities as carefully as usual:**

1. Yes
2. No

5.8. **During the past 4 week, how much did pain interfere with your normal work (including both work outside the home and housework)?**

1. Not at all
2. A little bit
3. Moderately
4. Quite a bit
5. Extremely

The next three questions are about how you feel and how things have been during the past 4 weeks. For each questions, please give the one answer that comes closest to the way you have been feeling, How much of the time during the past 4 weeks

5.9. **Have you felt calm and peaceful?**

1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. None of the time

5.10. **Did you have a lot of energy?**

1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. None of the time

5.11. **Have you felt downhearted and blue?**

1. All of the time
2. Most of the time

3. A good bit of the time
4. Some of the time
5. A little of the time
6. None of the time

5.12. **During the past 4 weeks, how much of time has you physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc)?**

1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. None of the time

5.13. **During the past 4 weeks did you feel that you forget things?**

1. Yes
2. No

5.14. During the past 4 weeks someone has told you that you forget things?

1. Yes
2. No

5.15. In general, during the night:

1. I sleep very well during the night
2. I sleep better in the first part of the night
3. I sleep better in the second part of the night
4. I sleep badly during the night

5.16. In general, during the day

1. I have a lot of energy during the day
2. I have more energy during the morning
3. I have more energy during the evening
4. I have little energy during the day

5.17. How many hours did you sleep tonight?

5.18. Schedule:

Get up **To go to bed**

6. **Satisfaction with life scale**

6.1. **In most ways my life is close to my ideal**

1. Strongly disagree
2. Disagree
3. Slightly disagree
4. Neither agree nor disagree
5. Slightly agree
6. Agree
7. Strongly agree

6.2.The conditions of my life are excellent

1. Strongly disagree
2. Disagree
3. Slightly disagree
4. Neither agree nor disagree
5. Slightly agree
6. Agree
7. Strongly agree

6.3.I am satisfied with my life

1. Strongly disagree
2. Disagree
3. Slightly disagree
4. Neither agree nor disagree
5. Slightly agree
6. Agree
7. Strongly agree

6.4.So far I have gotten the important things I want in life

1. Strongly disagree
2. Disagree

3. Slightly disagree
4. Neither agree nor disagree
5. Slightly agree
6. Agree
7. Strongly agree

6.5.If I could live my life over, I would change almost nothing

1. Strongly disagree
2. Disagree
3. Slightly disagree
4. Neither agree nor disagree
5. Slightly agree
6. Agree
7. Strongly agree

7. **Perceptual abilities**

7.1.Do you see well enough to recognize a person to a distance of four meter or across the street? (If you wear glasses or lenses, consider that the question refers to situations where you are using the glasses or contact lenses)

1. Yes
2. No

7.2.**Can you recognize at a distance of one meter?**

1. Yes
2. No

7.3.**Which of the diseases listed below are responsible for ensuring that you do not look good at a distance of 4 meters?**

1. Cataract
2. Muscular degeneration
3. Diabetic retinopathy
4. Glaucoma
5. Blindness since birth

6. Hypermetropia
7. Myopia
8. Astigmatism
9. Others:

7.4. **Do you use glasses?**

1. Yes
2. No

7.5. **Do you use headphones or other devices to improve your hearing?**

1. Yes
2. No

7.6. **Could you hear a television program at a level that others consider standard? (If you use a hearing aid or hearing aid, consider that the question refers to those situations where the prosthesis is used or headset)**

1. Yes
2. No

8. **Motor symptomatology**

8.1. Do you have a degenerative osteoarthritis?

1. Yes
2. No

8.2. Do you have a arthritis?

1. Yes
2. No

GIBSON'S SPIRAL TEST

DIGIT SYMBOL TEST

9. **Cognitive abilities: memory**

Memory Assessment Clinic Self-Rating Scale (MAC-S)

How would you describe your capacity to remembering the next activities?

	1	2	3	4	5

	Very poor	Poor	Average	Good	Very good
9.1.The name of a person it has just been introduced to you					
9.2.Specific data from an article or newspaper you have recently read					
9.3.Switch off the lights, unplug the electronic devices and lock the door of your house when you go out					
9.4.Intend to take something with you (for example, an umbrella or a letter), before leaving a room or going out					
9.5.Remember something as a house address that you were told a few minutes before					

	1	2	3	4	5
	Very poor	Poor	Average	Good	Very good
Please indicate the answers that suits you better					
9.6.How would you describe your memory capacity comparing to the rest of the society?					
9.7.How would you describe your actual memory capacity if you compare it with the highest capacity you got in the past?					
9.8.Think about the moment your memory was at the highest level, how would you describe your speed ability now to process new information?					
9.9.How often do you get upset or frustrated due to your actual memory capacity?					

The following questions are about minor memory mistakes which everyone makes from time to time, but some of them happen more often than others. We would like you to tell us how often in your opinion these things happen to you.

	1	2	3	4	5
	Never	Rarely	Sometimes	Quite often	Very often
9.10How often do you feel you are again in this situation?					
9.11.Repeat the same story to the same person on different occasions.					
9.12.Have often do you have difficulty remembering a word that you want to use?					
9.13.Have often do you have difficulty remembering a word that it is on the tip of your tongue?					
9.14. How often do you come up with familiar faces without knowing why do you know them?					

10. **Interaction with technology**

10.1.Have you ever used a PC?

1. No, never
2. Sometime
3. Many times
4. Daily

10.2.What do you use the PC for?

1. Nothing
2. Internet
3. Chat
4. Facebook
5. E-mail
6. Reading things (newspaper, etc.)

7. Watch film
8. Videogames
9. Work
10. Others

10.3.Would you like to talk to relatives via internet or meet new people?

1. Yes
2. No

10.4.Have you ever used a touch screen?

1. No
2. Yes, in big screen
3. Yes, in small screen

10.5.Do you think it is easy to use?

1. Yes
2. No

10.6.It is uncomfortable to use?

1. Yes
2. No

	Frequency of use					Relatives or friends with:	
	Never	Sometimes	Daily	Every week	Monthly	Relatives	Friends
Mouse							
Webcam							
Keyboard							
Headphones							
Microphone							
TV							
Remote control							
CD player							
Mobile							

Big touch screen							
Small touch screen							
Speech recognition							