



Join-In

Senior Citizens Overcoming Barriers by Joining Fun Activities

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1 About Join-In

Join-In aims at providing the methodology and the technologies for elderly persons to participate in social activities and have fun via digital media.

Loneliness in the elderly is a major problem in elderly care. Studies in Britain show that more than half of the people over the age of 75 live by themselves. Many of these suffer from loneliness and social isolation¹. Activities offered by social services do, however, often not reach those most in need. Challenges for the elderly include: social deprivation, low self-esteem or physical inability. Social isolation and health are closely related and may lead to a variety of physical disorders and even depression. Studies have shown the correlation between loneliness and poor health. Especially the effects on immune system, the cardiovascular system and the onset of Alzheimer's disease could be shown²³⁴.

The Join-In project aims at counteracting loneliness in the elderly by providing a concept, the methodology and technologies for elderly persons to participate in social activities.



Fig.1 Join-In Platform

Join-In is setting up a social platform for the elderly; it allows communication by TV, Tablet and PC. A multi-player serious game for the elderly is being developed. The interest in

¹ Office of National Statistics: Older people, Living arrangements.

² CARMA – Care for the Aged at Risk of Marginalization (QLK6-CT-2002-03421)

³ Sorkin D, Rook KS, Lu JL(2002)

⁴ Tomaka J, Thompson S, Palacios R (2006)

gaming is high in seniors: In a survey performed in Germany with 1200 participants, age above 61, two out of three PC users stated that they enjoy playing games regularly on the internet⁵. Studies⁶ could demonstrate the increase of cognitive skills, reaction times, self-esteem and the sense of well-being in the elderly when playing computer games. Another positive effect is that gaming is multigenerational and enables the elder generation socialising with the younger one, e.g. grandchildren. The concept includes exercising either by exergames or by moderated exercises as physical activity -besides supporting good health- counteracts the feeling of loneliness, while loneliness leads to less physical activity⁷. Recent results indicate that exergames create physical benefits and counteract loneliness⁸. Join-In encourages contacts with peers in the region and with family and friends living further afield - if necessary facilitated by an assistant.

Active participation is vital if the individual is to profit from the Join-In developments. Yet motivation for participation among the elderly is a challenge. One of the issues is the heterogeneity of the elderly, among other things regarding interests and health. Join-In is developing a methodology for elderly persons to participate in social activities. This is based on a thorough user requirement analysis. User groups are set up in Germany, Hungary, Ireland and Norway. The major user group is based in Munich. Based on the results of the user requirement analysis and the analysis of relevant studies and related work a methodology for setting up a social networking platform which encourages and enables homebound senior persons in social networking activities being developed. Digital inclusion and factors hampering its acceptance -such as lack of accessibility, lack of motivation, lack of skills and confidence- will be tackled and form part of the methodology. The involvement of user groups in four different countries will help us to achieve a European solution which will also be useful in other countries.

The Join-In project web-page:

<http://www.join-in-for-all.eu>

⁵ OE24.at. Deutsche Studie - Sechs von zehn Senioren spielen am Computer.

⁶ Basak C, Boot WR, Voss MW, Kramer AF (2008)

⁷ Hawkley LC, Thisted RA, Cacioppo JT (2009)

⁸ Zafar, Aylin (2011)

2 Introduction

This deliverable describes the methods and first results of the user analysis which serves as a basis for the development of the Join-In platform, the applications and the methodology for involving the elderly.

Though we had user groups in 4 different countries (Germany, Hungary, Norway and Ireland) only the German and the Hungarian organisations are project partners of the Consortium and thus equipped with time and funds. The work of the Norwegian and Irish user groups are to a great deal based on voluntary input. The Hungarian user group could – for political and administrative reasons- become active in the project after year 1 so that the German group became “the most important” meaning that many of the results are based on results from that user group.

2.1 Objectives of the work package “User Requirement Analysis”

Join-In will reduce loneliness of the elderly by enabling them to participate in social activities such as communication, gaming and exercising.

In order to meet the needs and interests of the elderly and in order to involve the users we defined the following research questions:

Which are the day-to-day activities of the users and what are their attitudes towards exercising?

One outcome of Join-In will be an exergame and a scheme that allows elderly people to do virtual moderated exercises. For this it is important to find out how these exercises can be embedded into the life of elderly people.

What activities and games are the “favourites” of the elderly?

The answer to this question will provide the surroundings of the game and the type of game. At this point it is important to verify the usability as well as the suitability of the envisaged games.

Which anxieties might hamper the acceptance of the social platform and user acceptability towards the technologies to be used?

The form of social networks has been changing through the development of information and communication technologies. Van Dijk assumes that the quality and quantity of social relationships might improve with this development⁹. New technologies enable easy access; it is possible to communicate with people across (a far) distance. Communication is only a minor example of the possibilities that arise with information and communication

⁹ Cp. Van Dijk (2006)

technologies. Van Dijk states the possibility of decreasing quality and quantity of social relationships; he substantiates this by stating that social media might substitute face-to-face communication.

We see a social network as a good way for communicating for people that find it difficult to leave home. Yet, the fear of technology taking away humaneness is omnipresent. It is because of this, that it is important to know what might hamper the acceptance of the social platform in order to meet the needs of the user group.

Which are the technical requirements that need to be met?

In the development of new technologies for elderly people it is important to keep in mind that the technologies have to be user oriented. Elderly People of today have not grown up with new communication media and have to be introduced to new technologies in an adequate manner.

How can the elderly be attracted to digital media and to the social platform?

This will be a summary of the results of all the questions. Lifestyle, attitude to life, health and the social network of the target group will be put in relation to the questions and result in a methodology.

3 User Requirements Germany

The target group of the project are elderly people, especially those who are not able to leave their homes.

There is no clear definition concerning age. Seniors can be people starting at the age of 50, 60 or 65. Chronological age is not a sufficient yet an important distinction¹⁰. The Consortium decided to collect user requirements regarding the age in four categories, these being: from 56 to 65 years, from 66 to 75, from 76 to 85 and the category of people over the age of 85. One of the Reasons for involving also younger elderly were that for one reason the Norwegian partners were involving user groups that were dealing with specific health problems concerning heart and lung and that the members of this group were younger. In Germany it turned out impossible to address the homebound elderly on user requirements: neither were a lot of those people willing to letting “strangers” into their houses nor would it have been possible to do the test setup which we pursued.

The group of elderly people is a very heterogeneous group: Seniors might have family or not, they might have a job or be retired, they might live alone or with their spouse, they might be mentally in perfect shape or suffer from Alzheimer or Dementia, they might be healthy and able to travel or suffer from any age-based disease. Old age nowadays defines itself through its diversity.

One thing that is common to the different ages is the definition of the negative aspects of ageing. Two main negative aspects are the deterioration of the body and the exclusion from society¹¹. The Join-In Project will offer the possibility to counteract these.

Users play a very important role in the development of AAL-Technologies. To ensure influence of the elderly in the project users are being involved in different countries. Though the main target group of the project are the elderly which find it difficult to leave their homes and to join social activities for user requirement analysis it was impossible to address these directly. After some discussion with the elderly it showed that from a certain stage people become very aware of their fragility and that they might soon be homebound. These elderly proved a very productive and grateful audience for our user requirement analysis.

3.1 Involving the Users

Working with users is substantial for AAL funded projects. It is very important to understand the users' way of life and their needs and wishes. The Join-In participants are being recruited from senior clubs, patient organisations, church associations, and from voluntary neighbourhood support groups. Home care patients will be involved at a later

¹⁰ Cp. Jakobs, Lehnen and Ziefle (2008), p. 15 and Bowling, See-Tai, Ebrahim, Gabriel and Solanki (2005), p. 487f. have shown that over half of the interviewed seniors felt younger than they were.

¹¹ Cp. Jakobs, Lehnen and Ziefle (2008), p. 12

point of time. All of these persons have a common interest: staying healthy and self-sufficient.

The interests, wishes, fears and behaviour are being assessed by questionnaires, focus groups, interviews as well as observations. By way of gaming sessions we gather user requirements and assess the suitability and user friendliness of the games, controllers and platforms. Known as well as unknown games are offered to the users. The games include board games as well as computer games and exergames using Wii and Kinect. The results of the user assessment provide the basis for the developments.

We involve key persons that deal with different aspects of elderly care such as education, social work, ambulatory and stationary care. Their contribution is very valuable when developing a solution close to the user. They also play an important role regarding trust building, which is the foundation of motivation and an important aspect of the work with users, as it will be shown later on.

A social network requires an active participation; yet, motivation is not easy. Therefore, part of the project deals with assessing the motivation of the users and with finding ways to motivating this special group. Another goal of the project is to find solutions that are usable as well as accepted.

One way of motivating users is involving them in the process. Thus we asked users, in this case the serial focus group, to help us developing flyer for the users. At the beginning of the project – after having explained the goals and proceedings- we had asked the serial focus group, what was most important to them concerning the project. We based the contents of the flyer on the answers to these questions and created a draft which we presented to them. They were invited to discuss the flyer in content and layout. While the group was in general happy about the content we were asked for changes on the sizes and colours of the text, but also for some changes about the wording. There was a discussion about whether or not the flyer should appeal to or invite the users. The group came to the conclusion that the appeal could be made through an appropriate picture, while the text should be invitational. The members of the group gave some examples for appealing pictures. This activity gave a really boost to the acceptance of the project.

Another involving activity was the development of the Join-In controller.

3.1.1. The Diakonie München-Moosach

The Diakonie München-Moosach (DMM) is a carrier which has been providing social services to the north-west of Munich since 1965. Children and youth establishments, as well as social and legal helpdesks are part of the Diakonie München-Moosach. The main focus concerns the work with seniors.

The largest part of the work with the elderly is elderly care nursing. Besides this, the DMM has set up Senior-Clubs of the church community; it offers gymnastics and dance classes as well as a cultural and a travel program.

Through the diversity of its activities DMM has access to different groups of seniors; on top of that it has experience on dealing with different target groups. An important topic of all the seniors is physical as well as mental mobility. The aim of DMM is motivating different groups of seniors for a variety of activities as well as assisting and cultivating those activities in the process. DMM works with different partners. The most important partners are three protestant churches, the municipality of Munich, the social community centre, REGSAM (regional social work Munich), the service centre for the elderly (AWO), the protestant educational institution as well as different facilities of the Diakonische Werk Bayern in Nuremberg and Munich. The work is carried out by an interdisciplinary team of experts in care, education, health orientation, social work and sociology.

3.1.2. The user groups and their key persons

A number of activities were identified for gaining support for Join-In and for identifying user requirements. These are described below.

Senior-Club 1 has an average of 40 visitors; it takes place once a week. Usually the Senior-Club begins its meeting with the organiser welcoming the group, taking care of organizational tasks¹² and introducing the topic of the meeting. After this introduction the seniors eat cake and drink coffee or tea. Then the tables are cleared and cleaned by the kitchen staff preparing the room for the presentation. The Senior-Club members have a high cultural interest. The topics range from “traditions during easter-time” to “Europe and human rights”. Some afternoons exercises or memory training are offered to the participants. The meetings always end with a closing comment of the organiser. Most of the seniors are older than 75 years and mobile. They are able to reach the meetings on their own. 5 participants are brought by car to the Senior-Club by an employee of the DMM. The percentage of men is approximately 20%. The average education level is high, due to the fact of the cultural topics of the club.

Senior-Club 2 meets once a month in the church hall of another church. 10 to 20 participants join this group for cultural topics. At this meeting everyone sits around a big table. The organiser of this group leads the group through the course of events which are similar to the course of events of the other Senior-Club 1. Since this group is smaller and has a more personal character it is a good group for group discussions. The age and gender distribution is also similar to the Senior-Club 1. In the beginning the Club 2 participants differed from the ones of the Senior-Club 1, but over time the groups merged.

¹² Informing the group about upcoming events, such as journeys and gaming sessions and sometimes about the funeral of a member of the group

A certified dancing instructor looks after two **dancing groups**. They meet once a week for 90 minutes of dancing. The number of participants varies from 16 to 30 in each group. In order to participate successfully it is important to learn the dance steps; it is because of this, that the group does not have random participants that only take part now and again. This group consists of younger seniors; they are very active and mobile since they dance on a regular basis. In total there are 3 men. For most of the dances there is a male and a female part. Since most of the participants are women, they use either a wooden clip or a fabric string to distinguish the male dancers.

The **gymnastics group** meets once a week and has from 5 to 10 participants, they are led by a gymnastics instructor. The health situation of each participant is different as well as their ability to follow the exercises. The program comprises different types of exercises with different degrees of difficulties.

The **Neighbourly help** was created in order to meet the needs of persons who are disadvantaged. A big part of the work that is done under the name of neighbourly help is done for seniors, like cleaning windows, mowing the lawn or simply accompanying them.

Another group of users are the **village seniors** from the Olympic village in Munich. These seniors meet every second Friday. They gather for cake and coffee and discuss different topics. At every meeting the group leader reads a short story.

Key persons add a very significant value to the project.

3.2 Research Design

Since the users of AAL technologies are very heterogeneous it is essential to deal with the different characteristics of the group. A possibility to get a general understanding of users is by using personas (see Appendix J for a Persona example).

“Personas enable designers not only to build precise narrative descriptions of the potential users of a system, but also the goals they want to achieve.”(Budde, Stulp & Sancho-Pradel 2008)

For defining the personas the following aspects were taken into account

- **Life situation:** due to working mobility one is able to speak of the “Multi-Local and Multi-Generational Family” (Bertram 2000). Many elderly people live far away from their children and grandchildren. In Germany elderly people live mostly in households of one or two persons. In the year 2009 44% of the women over the age of 65 lived alone and 18% of the men. 50% of the women and 74% of the men lived with another person. Only 6% of the women and 8% of the men live in a household with 3 or more residents¹³. The key task here is to develop and promote

13 Cp. Statistisches Bundesamt 2011, p.20

the communication to an existing network and to a new network. The network size usually reduces with advanced age.

- **Health situation:** It is possible to divide the health situation into three groups. For each of these groups new technologies play a different role.
 - For the **healthy group** new technologies are important to preserve mobility and autonomy of the persons.
 - For the group that is **showing first limitations** exercises are important to prevent further limitations or to decelerate the aging process.
 - For the **limited** group technologies are important to support autonomy and to avoid isolation.

Interests and Hobbies: The interests of the users are as the group very heterogeneous. They can be categorized into the following:

Cultural Activities are very important for elderly people. They are interested in literature, theatre, excursions, photography and music

Games like card & board games, crossword puzzles and Sudoku. Many elderly people choose certain games due to the fact that it is a form of memory training

Physical activities are done in order to keep the body active. The fear of falling is one of the biggest fears and it can on the one hand motivate people to do exercises to lower the probability of falling or on the other hand it can overwhelm them with the consequence of refusal of movement.

Media usage is basically watching television and listening to the radio. With rising age the probability of elderly people using a computer diminishes.

The Consortium, therefore, decided to also use also the television as a gateway to integrate a new technology into everyday life

4.1.1. Research methods

To meet the needs of the research questions a method mix is most appropriate. Through this a complementation of qualitative and quantitative data is possible, which enables an insight into the different social aspects that are dealt with in this field of work. The explorative character of the research makes qualitative research methods indispensable. Qualitative research methods in this case aim at capturing the life world of the users from their perspective.

Since Germany has the lead on this WP all methods were used with these users. It was not always possible to collect comparable data in the other countries of the consortium. The Irish user group for example is more experienced in the usage of new technologies, therefore the approach at this stage was different as well as the methods used.

4.2.1.1. *The Guided Interview*

Guided interviews are used to get an insight into topics such as favourite activities of the elderly, day-to-day activities, definitions of life quality and interests. The interviews are digitally recorded, transcribed and analysed.

4.2.1.2. *Structured Interviews*

Structured face-to-face interviews are used to collect data regarding the technical equipment of the users. Since the questions in this case are not related to the topic discussed before, as it was the case with the self-administered questionnaires. The interviewer has the possibility to explain the background of the questioning as well as motivating respondents.

4.2.1.3. *Self-administered Questionnaires*

Self-administered questionnaires are used to collect data regarding gaming behaviour, gaming preferences, physical activities and evaluation of exergames. While working with self-administered questionnaires, one has to consider on one hand, the risk of non-response and data quality and, on the other hand, that the presence of an interviewer might influence the responses.¹⁴

The needs of the user group are taken into account while designing the layout of the questionnaires, the font size was big, and the possible answers were highlighted differently in order to be distinguishable. The length of the questionnaires is also taken into account in order to protect the users and not overstrain them. The questionnaires consist of multiple choice items with an open answer category, free response and five point Likert scale items.

Since some respondents participated in several gaming sessions, each of them was assigned a number, in order to preserve their anonymity.

4.2.1.4. *Working with groups*

Working with groups has several advantages. This research method is used for topics that benefit from the interaction of the group. The participants will generally stimulate each other's responses and through this, present new aspects. The researcher is able to observe the group and their interactions. It is important for the researcher to observe the group dynamics, since it influences the outcome of the discussions.¹⁵

With focus group research one is able to increase qualitative insights into specific topics, attitudes and behaviour.¹⁶ The essential purpose in this case is to collect knowledge on perceptions and behaviour on topics regarding the project.

Focus groups in this case are seen as a group discussion rather than an in-depth group interview¹⁷.

¹⁴ De Leeuw (2008)

¹⁵ Cp. Debus (1988), Smithson (2008)

¹⁶ Cp. Dürrenberger et. Al (1999)

One of the ways to involve the users in the process was the realization of a serial focus group¹⁸. The participants for this focus group are key persons that are involved in different ways with the elderly¹⁹. The participants are informed about the topic being discussed beforehand. The focus group meetings last between 90 and 120 minutes. A log is being written and the results are gathered.

The serial focus group is important to verify and ensure the comprehensibility of the project. The discussions point out aspects that are important for a continuous reflection of the research project.

4.2.1.5. *Group discussions*

Group discussions are held in one of the senior clubs. The composition of the group is adequate, since participants are in a familiar setting. They are not afraid of talking about their needs. The topic of the group discussion is being presented to them in the beginning of a session; the participants are then guided through the different aspects of the topic being discussed. The topics as well as questions concerning these topics are defined before each session. A log of each discussion is written and the results gathered.

4.2.1.6. *The researcher*

In social research it is important to reflect on the position of the researcher, especially in the case of participation in the social life of the investigated group of people. In our case the researchers are known to and closely involved with the user groups. The researchers want on the one hand to gain the acceptance of the users and on the other hand see things from their perspective. It should be mentioned that in this case the researchers are not able to feel the same as the users because of the age difference. It has been possible for the researchers to understand the living environment of the participants. Taking part in their leisure activities and following their interests has given the researchers a better understanding of what the users like and what they don't like.

The researchers participate in different leisure activities, such as the meetings of the senior clubs, short term excursions and dancing sessions. The researchers organize gaming sessions, from which many of the participants have benefited. The gaming sessions have turned into a regular activity, which the elderly ask for. Participants are able to verbalize their interests and through this influence the program of the gaming sessions.

Through the participation the users were also able to know the intentions of the researchers. They need to understand, that the researchers are interested in their lives and opinions and that they respect them and their opinions. When the researchers participate in the field they are investigating there is always the risk of "going native". In this case things are being developed for elderly people, due to this there is a high interest in giving a voice to the needs of the users it is only in the project's best interests that the

¹⁷ Cp. Smithson (2008), p. 358

¹⁸ A focus group that meets several times about the same topic, yet different aspects

¹⁹ Key persons such as pastors, home care personnel, social advisors, physiotherapist, gymnastics and dance instructors and senior club organisers.

researchers take the side of the users and represent their points of view. It has raised their willingness to participate in interviews and to give information which they would usually not tell a stranger.

4.1.2. Ethical Issues

The researchers have the ethical responsibility of ensuring *“that the physical, social and psychological well-being of research participants is not adversely affected by the research”* (Statement of ethical practice for the British sociological Association). The researchers have to protect the rights of the participants: their interests and privacy. The users choose whether or not to participate after having been informed about the research. The participants are asked for permission before recordings.

Participating has a positive effect; the research settings are activities chosen by the participants. Because of this a high incentive is not needed. The activities themselves are a big incentive for the participants. After filling out the questionnaire the participants receive a little chocolate treat.

In the piloting phase informed consent is of high importance. The users will be informed about the project (objectives, setting and conditions) and the data that will be compiled as well as what will happen with that data. It is also important to reassure the users that their participation is voluntary and free of charge, and that they can always choose if and to which extent they want to participate. They can choose at any point to stop their participation in the piloting. They will receive this information in writing.

4.1.3. Methods of analysis

3.2.3.1. Quantitative Data

The data gathered by the structured interviews and the questionnaires is coded and analyzed in a descriptive manner, since the compiled data is nominal and ordinal scaled. This analysis enables a general idea of the tendencies in the group of elderly people.

3.2.3.2. Qualitative Data

The qualitative data gathered through guided interviews and observations is analysed by a summarizing content analysis²⁰ and inductive content analysis according to Mayring²¹. In the case of an inductive content analysis categories are defined as well as selection criteria and the abstraction standard, then data is analysed with the categories. This is a process with feedback loops to verify the categories and the coding. This analysis enables summarizing and structuring the data material in order to obtain basic information.

²⁰ This analysis aims at reducing the material by preserving the essential contents. Cp. Mayring (2004), p. 468 ff.

²¹ This analysis follows the principal of the summary content analysis to gradually develop categories from the data. Cp. Ibid.

3.3 Fields of interest and research findings

3.3.1. General condition of the users

The general analysis of the elderly users was done by scenarios and personas. Scenarios specify how the aimed users carry out tasks in a specific context; they are the basis for usability testing.

3.3.1.1. A general understanding of users: a Persona Analysis

Participants of the focus group in Germany as well as users from other countries were asked to write a description of an elderly person, resulting in specific personas.

The analysis of the different personas and scenarios made it possible to work out the **different kinds of needs** which are important for the Join-In project:

Health improvement: in this case it can be seen from two different aspects. The first aspect is physical and the second one mental health. In the case of the physical health exercises and physical therapy have to be distinguished. Concerning mental health it is not the ambition to treat mental illness but to offer brain exercises so that elderly people can train their mental skills.

Interaction with the social network: the users have the need for general communication with existing or non-existing networks. They also have the need for entertainment in form of games, as a way of connecting with other people. Social networks can also be used as a motivator for exercising.

Besides the focus: External assistance (monitoring or the possibility of setting reminders) as well as an expert platform for intercommunication could be valuable outcomes but are not the main goals of Join-In.

3.3.1.2. Points of discussion and results from the serial focus group

In a first session the serial focus group met to gather information about life quality, technologies, social networks and communication. Life quality of elderly people was defined with mobility in general and with the possibility to travel, health, being part and taking part as well as learning²². The findings regarding technologies, communication and networks will be discussed in chapter 4.5.

In another meeting of the serial focus group questions were gathered regarding the project. It is possible to assign the questions to the following topics:

²² In the year 2007 54% of the persons from age 55 to 64 stated learning something either by formal education (school, university), not-formal education (advanced training) or by informal learning (learning intentionally, through persons in their surroundings or with media). For the age group from 65 to 80 the percentage was at 42%. Cp. Statistisches Bundesamt 2011

Costs: As it will be explained in chapter 4.5 one of the fears regarding new technologies are the costs. Elderly people choose very carefully how to spend their money. They are also afraid of unwillingly producing new costs.

Remote control and handling: Since the eyesight and fine motor skills decline with old age, the remote is an important aspect to consider. This confirms the considerations taken into account at the beginning of the project

Information/Flyer: Since written information is more easily assimilated. It is necessary to offer users an Information sheet, so they can inform themselves at their own time and speed.

Culture and education: it came up, that there is a strong interest for culture and education.

Communication: Communication is a definite need which constantly reappears in the following research.

Technology vs. humaneness: The focus group found it very important to emphasise the fact, that technology should not take away humaneness. We have made the experience throughout the project that this is a substantial fear of people who are not experienced in the use of new communication technologies. The aim is not to exchange human contact or communication for new technologies, but that it is the intention to facilitate communication by ICT.

At a further session open questions were discussed. This session showed, that the participants had understood the idea, but that there were certain things that were not clear to them. Certain fears came up, especially the fear of humaneness being taken away by technologies.

3.3.2. Hobbies and favourite activities

In Germany an important part of the wishes or plans elderly people regarding their future are related to mobility and travelling²³. This wish decreases with age. More than half of the persons above the age of 65 years (59%) travelled somewhere in the year 2009. 55% of these spend time in other countries, 40% only in Germany and 5% travelled in and outside the country.²⁴

The interviews show that the elderly adjust to their health situation and to their possibilities. Another important hobby is gaming, especially card games. They meet with friends on a regular basis. As far as their health situation permits they take part in activities such as neighbourly help or handcraft. Volunteer work is important to many of the elderly people. In 2009, 37% of the persons from age 60 to 69 did volunteer work. For the age group above 70 the percentage only falls to 25%, meaning that every fourth person is active for the

²³ Cp. Jakobs, Lehnen and Ziefle (2008) p. 17

²⁴ Cp. Statistisches Bundesamt (2011), p. 41f

community. In many of the cases their volunteer work is directed towards other elderly people, by this helping to overcome some of the problems the demographic change is bringing to these societies.²⁵ The elderly are interested in cultural activities such as concerts and theatre, one of the interviewed persons even sings in a choir. A short survey in the senior club I showed that most of the participants like reading, music, gaming as well as sports like dancing and swimming.

A Study of SWR²⁶ confirms these results. It showed that when it comes to activities in the elderly user's leisure time it is most important to them to spend time with friends and acquaintances (81%). 70% stated the importance of having fun in their leisure time. Based on a month the most common non-medial activities for persons from age 50 to 74 were sports (5 times a month) and spending time with friends (4 times a month).²⁷

3.3.3. Games

Games have accompanied humanity throughout approximately the last 5000 years²⁸. They provide a good means for communication and a means to socialise. You do have to be familiar with all your co-players in order to join a game. Board gaming offers the possibility to get to know strangers". This is why Join-In chooses gaming as a one activity for socialising.

In a group discussion under the subject "once upon a time..." the group discussion showed that there were three types of games the user group played in their childhood: board games, games outdoors and "fantasy" games –games people made up in their own minds. The following board games were those mainly named in the questionnaires when asked about the games they remember from their childhood: Chinese Checkers, Rommè, Nine men's Morris, Checkers, Memory, Ludo etc. The games the participants played outside were: "Ring around the Rosie", marble, skipping, dodge ball and playing with animals. They also named singing games, counting things and making practical jokes as well as playing in nature inventing games. Ludo brought up many memories and emotions.

There are six different basic patterns of board-games²⁹:

- Order: placing gaming pieces in the right order is the basis of games such as four-wins, scrabble and Mah Jong.
- Combat: chess and checkers are the oldest examples of games with combat as a game principle. The main task here is to beat the other player by reciprocally narrowing the possibilities of action of the opponent.
- Diffusion: this pattern is similar to combat; in this case the main task is to assure ones diffusion. Examples for this pattern are Monopoly and Go.

²⁵ Cp. Ibid, p. 40f.

²⁶ Südwestrundfunk, radio broadcasting corporation in South-West Germany

²⁷ Cp. Grajczyk (2001)

²⁸ Cp. Hemme (2010), p. 91

²⁹ Cp. Fritz (1992), p. 105ff.

- Race: This pattern can be found in games such as Ludo and Backgammon. The goal is to reach the finish line before the opponents do.
- Enrichment: The goal of these games is collecting as much money or pieces as possible. This pattern is visible in new games but also in very old games such as Mancala.
- Testing and probation: Memory for example tests if the participants remember where the correct card was. Another type of testing games is quizzes with questions regarding different areas.

Games are often classified the following way:

- Tile-laying game - a board game in which players place tiles on a board during the course of play. A type of game which has very popular with all kinds of users in Europe for many years

Example: Carcassonne

- Dice – a game using involving a dice – usually as a random device – adding the factor “luck”

Example: Ludo

- Tile-laying and dice

Example: In Settlers of Catan

- Card game:

Example: Rommè,

- Brain games - Memory and logic puzzles
- Strategy / Tactics – “generally built around a set of rules and mechanics with a unifying theme often added later”³⁰

Example: Risk

- Puzzles - are those “in which the players are trying to solve a puzzle. Many Puzzle games require players to use problem solving, pattern recognition, organization and/or sequencing to reach their objectives”³¹.
- Action Game / Training Dexterity - dexterity is necessary to win

Example: Jenga

- Cooperative games - You have to work together to win

Example: Inkognito

³⁰ <http://boardgamegeek.com/boardgamesubdomain/5497/strategy-games>

³¹ <http://boardgamegeek.com/boardgamecategory/1032/action-dexterity>

- Party Game /Communicative

Example: Activity: There are several phrases players have to find out. One player has to act or to describe and the other ones have to find out what that should be.

The German elderly users are not used to computers. We, therefore, could not test videogames with the users. We tried a few times but could not get the elderly interested one the reasons being the inability to handle the mouse.

In order to get an idea on the kind of games the users preferred we decided to offer regular “gaming sessions” starting off with board games. In order to get as much information as possible we chose games representing different categories. These are

- Card game: Rommè
- Tile laying game + strategy + tactics: Palace of Alhambra, Ghost Party, Carcassonne
- Card game & Strategy: Take 6
- Strategy, concentration, combination: Triomino
- Fun, fortune : Parcheesi / Ludo
- Dexterity: Jenga (game of physical and mental skill)

The disposition of elderly people to play new games is lower compared to young people, though the disposition it also depends on how many games the person knows and how well versed that person is in gaming³².

When one looks at gaming between elderly people it is possible to distinguish the following types of gaming partners: grandchildren, family and other elderly people. In the first case the grandparents will most of the time play for the sake of the children; in this case the emotional experience is of high importance. In the second case elderly people play with their children and possibly with their grandchildren, in this case usually classic family games are being played. When elderly people play amongst each other they mostly play card and dice games, depending on the gaming affinity of the group they also play medium or very challenging games. In all of the cases the main reason for playing is fun and the possibility of sharing with other people.³³ This also showed in the results of the questionnaires.

To find out the preferences and habits of gaming, gaming afternoons were organized. The first gaming session took place in one of the senior clubs. The tables were signposted with the type of games: Cards, dexterity, strategy and board game. Each of the games lasted between 45 and 60 minutes.

Two important topics were pointed out: communication and motivation. Games are always a medium for communication and in many cases also for joy. It was possible to observe,

³² Cp. Hemme (2010), p. 93

³³ Cp. Ibid., p. 95

how through a game a disturbed communication could be overcome. Easy games were well accepted, since the players were able to have a conversation while being involved in the game. Regarding the motivation it was made clear that winning increases the motivation to play. The participants are happy to realize they are able to learn something, whether it is to understand a new game or anything else. It was also possible to observe, that fair competition is a motivating factor and makes a game more interesting with the users.

Elderly people often do not like being confronted with new things, since it is difficult for them to retain the new information. They are afraid of embarrassing themselves in front of other people³⁴; therefore, we tried not to overstrain them by offering only one new game at a time.

In the first gaming session it was also possible to observe how physical limitations affected the participation:

- Hearing limitation: it was difficult to understand the rules and follow the game, especially with the loud background noises (other players in the room, sitting at different tables)
- Eyesight limitation: Small pieces and similar colours (blue/green) are often not recognized by the elderly – we therefore recommend choosing pieces specially designed for the use of the elderly³⁵.
- It was also difficult for the elderly persons to sit for a long period of time on chairs that are not as comfortable as the chairs at home.

These limitations are to be considered for the development of new games.

The following gaming sessions were organised separately from the club setting. The gaming sessions take place on different days of the week but at the same time and place³⁶. The elderly people are being invited to several gaming sessions. One of these gaming sessions was under the motto of getting to know new games. On other gaming sessions the participants are able to also choose from known games.

It has been possible to extract certain behavioural patterns:

- **Rules or explanation:** the rules of the games were more or less discussed at the beginning of the games, depending on the complexity of the game and the knowledge the players have of the rules. In the case of a known game it is very important to agree on the rules, so that everyone has the same understanding of the game. In the case of a new game it is important not to overburden the participants with complex rules; often they prefer to learn by doing. In the case of

³⁴ It also came up in one interview that the respondent could not sleep when not being able to deal with something new

³⁵ In Germany a few game publishing companies have created several games for elderly people. (E.g. http://www.ravensburger.com/schweiz/themenwelten/spiel_vergn%C3%BCgen/die_welt_der_patienzen/index.html and <http://www.senior-premium.de/>)

³⁶ The usual time is 14:30 and the place is the church hall.

complex games an explanation of the moves is important in order to understand the rules and to get the approval of having understood the rules³⁷.

- **Behaviour during the games:** Depending on the person it is possible to observe competitive behaviour and cooperative behaviour. At tables with a higher level of competition the feelings towards winning or losing are stronger; this means that these are participants that show more emotions and that seem to have more fun³⁸.
- **Motivation or interest in playing:** it is possible to distinguish three main motivational positions. The first motivational point is the understanding; once the participants understand the new game it is more fun. Since they are afraid of embarrassing themselves reassurance and a sense of achievement is very important in order to maintain the motivation. The second motivational point is that known elements ease the access to new games³⁹. The third motivational point is communication. Communication is very important; it is the medium for fun, exchange, instructions, etc. It is one of the main reasons why elderly people come to the gaming afternoons as will be explained in the following analysis of the questionnaires.

3.3.3.1. Summary of the results towards gaming and games

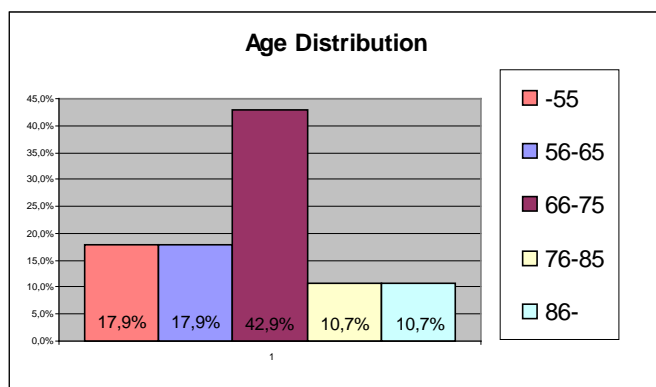


Fig. 2 Age distribution of the participants of the gaming sessions

So far two thirds of the participants are female (See Appendix I). Most of the participants are between the ages 66 and 75 (43%).

The main reasons why the users come to the gaming sessions in order of mentioning are:

- because they like playing games
- because they come to club meetings on a regular basis
- because they like being in company of people

³⁷ Since they want to be challenged it is also important that these tips

³⁸ They seemed to have more fun for outsiders, since there were shown many emotions including laughter, which led to other participants being interested in the game.

³⁹ For example:

Triomino: is very similar to Domino

Carcassonne and Alhambra: are reality based and due to this have a high recognition value.

- because they liked meeting their friends
- One person mentioned coming to the gaming sessions because of the coffee.

The games most of the participants know in order of mentioning are:

- Ludo
- Nine men's morris
- Rommè
- Chess and Checkers
- Canasta
- Skat
- Chinese Checkers

The games the German user group like best are Rommè, Chess and Nine Men's Morris. 63% of the participants also play at other occasions. Only half of them gave information as to what games they play, these are mainly Chess, Ludo, Rommè, Checkers and Nine Men's Morris. 65% of the participants that play at other occasions play on a monthly and 18% on a weekly basis. Another 18% play several times a week. The most important co-players are friends; the second most important are acquaintances and the third most important are grandchildren. Most of the times the participants play at home or at the homes of family and friends. Between the non-players it was possible to identify two main reasons for not playing: not wanting to play and not having someone to play with.

Computer Games

From the participants around 57% own a computer. It is clear that the elderly people using computers and knowing computer games are mainly under 75 years. Elderly above the age of 75 rarely own a computer and even less play or know computer games.

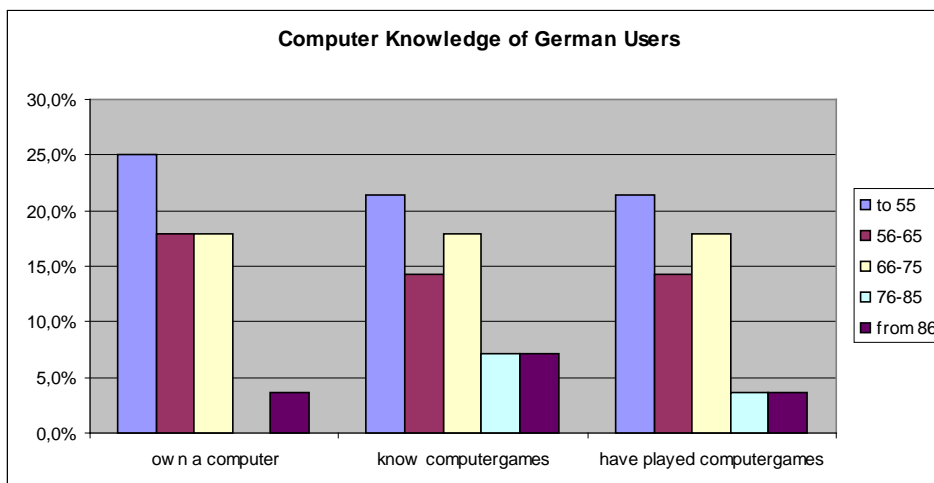


Fig. 3 Computer knowledge of the German Users (n=30)

The most important things regarding gaming are communication with others and fun.

In Computer games testing sessions the participants came to the following conclusions:

- ❖ Communication remains more important than the look of the game
- ❖ The explanation of the rules have to be visual and verbal
- ❖ It should be possible to correct one's mistakes or to verify one's pass before the next persons turn.
- ❖ It is important for the graphics to be distinguishable
- ❖ Things that cannot be done by a person sitting at the table should be provided by the computer (e.g. explanation of game sequences or showing the pass of the last player). This is important due to the fact, that on the one hand people can be distracted during a game or that the pass of the former player is too fast (these are also possible scenarios in face to face gaming sessions).
- ❖ A game should be useful (mind training)

3.3.4. Exercises

Exercises are very important especially for elderly people. Exercising has several benefits⁴⁰: cardiovascular benefits (exercise among other things reduces blood pressure and improves cardiac output), prevention of disability (physical exercise helps to prevent age related impairment), prevention of osteoporosis (the bone formation is enhanced through activities such as walking) and psychological benefits (exercises have a direct effect on depression, they also decrease anxiety).

In the following the results from the survey in the Diakonie are presented.

3.3.4.1. Exercising Behaviour

To assess the exercising behaviour of the elderly people the participants of the senior club were asked to fill out a questionnaire following an afternoon under the topic "enjoyment through movement". It was possible to observe the different degrees of fitness. Some participants had total mobility and some had trouble following easy exercises. Because of the diverse mobility in this group, the dancing/movement instructor prepared exercises with different levels of difficulty in order to not overstrain and challenge the participants. Elderly people do not want to be treated like children, they want to be challenged. As one

⁴⁰ Cp. Resnick (2001)

participant stated “The fact that they are slower does not mean that their intellectual demands decline”.

3.3.4.2. Summary of the results on Exercising Behaviour

The participants of the senior club are mainly women (85,2% of the people that filled out the questionnaires – See Appendix I) The biggest group are women between the ages 76 and 85 with 43,3% The second largest group are the women over 86 years with a total of 30%. The smaller groups are men and women from the ages 66 to 75 with 13,3% and 10% from the ages 56 to 65.

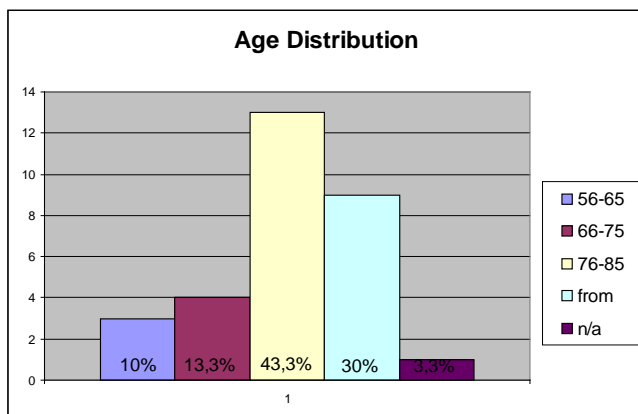


Fig. 4 Age distribution of Senior Club I

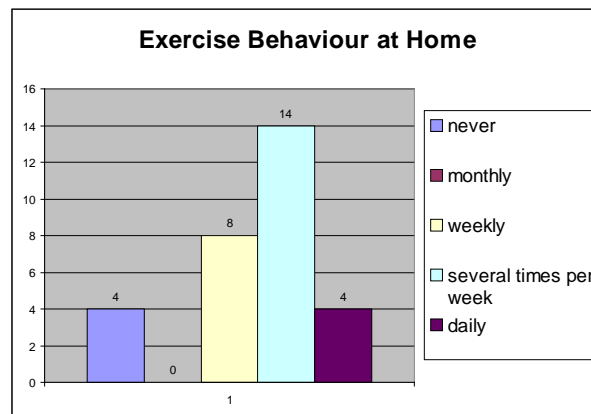


Fig. 5 Exercising in the German User Group

25 of 30 participants answered the question whether or not they had watched gymnastics on the television. 44% had watched it before and 63.6% of these persons had participated in the “television gym”. 26 Persons answered the questions regarding the exercising activities at home. 53.8 % of the exercising persons exercised several times per week. 15.4% on a daily basis and 30.8% on a weekly basis. Of the 22 people that stated to exercise only half of them answered the question about what kind of exercises they did. Most of them named specific exercises regarding hand, back, knees, shoulders, etc. One can say that the exercises are very health related and specific depending on the problem area.

The favourite sports activities⁴¹ done by the users when they were young were cycling which was checked by 83% of the participants, the second favourite activity was hiking⁴² with 77% and gymnastics with 70% in third place.

The question about what kind of sports they would like to do if they still could, was answered by only 43.3%. Hiking was the most common answer followed by dancing and swimming. One person said that she would like to do any kind of sport but that she could not due to her bad health situation.

⁴¹ Possible answers given and multiple answers possible.

⁴² Hiking is one of the favourite over all activities of the elderly people after travelling and spending time with family and friends. Ibid., p. 97

Studies have shown, that elderly people are well equipped when it comes to home exercise equipment. In the beginning of 2008 the rate of persons above the age of 80 with home exercise equipment was 21%. Senior households were better equipped than households of persons under the age of 25 (15%)⁴³

3.3.5. Exergaming

3.3.5.1. Wii

The degree of popularity of Wii bowling competitions among elderly people has been increasing in the last few years.

Few members of the German user group had heard of the Wii or had played it before. Two ladies were invited to a first gaming session; one of them had played Wii with her grandchildren before. After the first Wii testing session the participants acted as multipliers. Other members of the senior club wanted to participate in the next session. In each session the Wii was shortly explained by the instructor. To get a feeling of the controller the participants chose an avatar and started the game with the assistance from the instructor. The participants had a lot of fun.

The following games were tested:

- **Ski jumping:** the participants were very amused by the mii turning into a snowball. When one of the participants managed to jump in the right moment the avatar and the crowd waved, at this point the participants waved back, this happened in both testing sessions.
- **Bowling:** The participants had some difficulties at the beginning with the combination of both keys (A and B). After a few rounds this was no problem. Interesting were the different kinds of gaming behaviour. On one hand the competitive character was brought out and on the other hand they were rooting for each other.
- **Hula Hoop:** this was tested at the second session, it was found not adequate for 3 of 4 participants. The users were not able to move as fast as the Wii required. The participant that was able to do it complained about back aches the day after
- **Balance Bubble:** The game was shown to the participants with the explanation that it was a very difficult game. All of the users wanted to test it themselves. It was very challenging, yet the feeling of wanting to beat the others and one's former score, made the users try a few times. They were comparing techniques and said that this kind of exercise would be good for balance and for the gluteal muscles.

⁴³ Cp. Statistisches Bundesamt 2011, p.27

Conclusions:

- ❖ Bowling is most appropriate and is well accepted, also due to popularity of ninepins in Germany
- ❖ The sense of achievement augments the motivation
- ❖ The participants observe each other in a group setting and copy techniques
- ❖ Wii sessions are a way of opening people up to new technologies

The sessions are concluded by questionnaires. Due to the fact that the response rate was not very high at the beginning, the questionnaires were slightly redesigned. For the results of these questionnaires please see deliverable 5.1 chapter 5.

3.3.5.2. Kinect

The participants tried different games. They found the handling of the Kinect interesting, not having to use a remote control. They tried

- Bowling: The participants had some difficulties taking the bowling ball in their hands.
- Carnival: Found it funny, but most of the games were too fast.
- Dr. Kawashimas Body and Brain: They liked the Idea of training their brain, but they were afraid to look dumb in front of others. The games were too fast, it took the participants some time to understand how everything worked.

In conclusion the elderly had some difficulties with the sensors, for one they were not always able to hold their hand still for the time needed to select an option with the Kinect.

3.3.6. New Technologies, Communication and Network

At the first serial focus group meeting the participants elaborated also on the following aspects:

- **New technologies:** It is important to reduce the fears of elderly people regarding new technologies and at the same time to increase their interest and willingness to try new technologies. The speed of technologies has to be reduced in order to enable elderly people access to a comfortable use. Assistance for learning new technologies, at least at the beginning, seems indispensable.
- **Communication:** This is the most important issue for our target group. When using technologies different impairments need to be taken into consideration to enable age-based communication.

- **Networks:** It is very important for elderly people to have a task and to “feel needed”. These tasks often come from the real-life social network, specially the family. It is what links people to others and what prevents loneliness.

There are different things that need to be taken into account when talking about technologies and elderly people. Thanks to new technologies the possibilities have broadened, however the implementation fails due to a high complexity. Elderly people need big keys since their fine motor skills often decline, due to bad eyesight the labelling of the keys has to be easily visible; menus need to be self-explaining and simple. It is also important to keep in mind that the elderly people of today have not had the possibility to grow up with the new technologies, it is because of this that they do not have the technical understanding other generations have⁴⁴. There has been a great progress in the development of new technical possibilities, yet very few of them are adequate for persons without a technological background.

According to Schelling and Seifert⁴⁵ the main factors for not using the internet are:

- costs/security/time (high connection costs, not enough time, indecent contents, security issues and low credibility of the contents)
- sensorimotor function (difficulties seeing and hearing as well as problems with fingers or hand)
- learning/technology (using is too complicated, fear of technical problems, too complex to learn, memory problems, missing support with the handling)

Almost every elderly person owns a television and a telephone. All of the participants of the senior club watch television on a daily basis. 35% of the senior club members own a television younger than 2 years. 62% never use teletext and only 4% use it on a daily basis. 88% have never played a video game. 79% have never used a computer. Of the 17% using the internet, only 13% use the internet on a daily basis.

The interests of On- and Offliners are very similar. Although they have met similar needs new technologies don't make old technologies obsolete, they rather supplement them⁴⁶.

88% of the elderly persons use the internet for writing and for receiving e-mails. The second most popular function is general information search, schedule and travel information, information about administrative office, government agencies as well as topics regarding health. Less than 50% use the internet to read newspapers and magazines, for online banking, shopping and chatting⁴⁷. These findings are similar to the findings in the senior club.

⁴⁴ Cp. Ibid.

⁴⁵ Cp. Ibid., p. 26ff.

⁴⁶ Cp. Schelling & Seifert (2010), p. 17. A study regarding the usage of ICT by persons older than 65 years in Switzerland

⁴⁷ Cp. Ibid., p. 19ff. Cp. Statistisches Bundesamt 2011, p. 33f.

One effective way of reducing loneliness in form of a group intervention is teleconferencing. Email and other computer based functions encourage an interactive dialog and are also efficient in reducing loneliness. It has to be said, that support groups are only effective for people that have social skills which are necessary to join groups like these⁴⁸.

A group discussion with the topic of friendship resulted in a general insight into attitudes towards friendship. Some of the participants have close friends that do not live nearby; due to this they are not able to see them on a regular basis. They choose to talk with them on the telephone, yet they prefer to see them in order to be able to look them in the eyes.

The Join-In project was explained in detail to the users since the discussion lead to possibilities of interacting with friends via new technologies. The response was very good; the participants are looking forward to a user friendly solution. One participant found it surprising that this kind of solution could be developed in the near future.

3.4 Summary

Being able to participate in social life is one of the most important things throughout all ages. During the research process the users underlined, that the quality of life is reduced when the possibilities to communicate and share daily experiences with other people are not given. In the process of analysing the needs of elderly people towards the goals of the project we faced the following questions:

What activities and games are the “favourites” of the elderly?

To find an answer that applies to all elderly people is very difficult due to the fact, that the group of elderly people is very heterogeneous. The interests of a person might change, but the core interests such liking board games or liking conversation will not change. However, it was possible to find some recurring activities.

- Getting away and travelling - new and old surroundings: A topic that comes up in many studies and has come up in interviews and questionnaires is travelling and getting out. Persons from our user groups are especially interested in travelling (as far as their income and their health situation allow). Getting to know a new place is interesting due to the fact that it is new. Returning to places where they have been brings back memories and will often trigger the elderly telling stories of their past.
- Meeting friends or acquaintances: Staying in contact with other persons is the most important thing for most elderly people. They like feeling connected and being able to share. Many of them have regular appointments with friends for lunch, coffee or playing games. The aspect of sharing time with one another proved to be the most important aspect throughout all user requirement sessions.

⁴⁸ Cp. Findlay (2003), p. 654f.

- **Playing:** As mentioned before, if the persons have had the interest of playing games before, they are most likely to play again. The participants of the gaming sessions are persons that have played board games before. More than half of the participants play on other occasions and in the case of participants that do not usually play it is mostly due to the lack of gaming partners. The most important things while playing are communication with others and fun. The games they prefer playing are games that they have known for a long time or games that are useful for their mental health (“where the brain has to work “). It is important to have various levels of difficulty, given that issues that are too complicated tend to discourage people.
- **Cultural activities:** It should be taken into account that elderly people also have the interest for cultural activities in combination with the three topics mentioned before.

How to address the elderly?

- The process of trust building has proved to be a very important aspect of this research. This will be analysed further and described in D. 2.2.

What hampers the acceptance of the social platform and user acceptability towards the technologies to be used?

- Elderly people are afraid of being overstrained. It is not rare to hear a user saying: “I am too old to learn this” or “at my age I could not manage to understand”. These statements are often accompanied by statements such as “I don’t need it” or “My life has been good without it”. Due to this situation the approach has been very subtle, not forcing new games or technologies on them but showing the users the possibilities, even though seniors are scared of being overstrained
- Possibilities which new technologies offer are not available for people that have not had the opportunity of growing up with these technologies but they are very interested in learning new things and in keeping their brains active. This interest and the development of adequate and user friendly technologies will increase the acceptability of the technology to be used.
- Many of the existing soft- and hardware is not adequate for elderly people.

Which are the day-to-day activities of the users and what are their attitudes towards exercising?

- Aside from wanting to keep their mental health most elderly people also like doing exercises. As shown in chapter 2.3.4 most of the users do exercises on a regular basis, the exercises are mostly directed at specific parts of the body.
- The exergames have shown that the elderly also enjoy exercising when doing these in a group or having the exercises built into a game. An important aspect the users look for are exercises to train their balance. Balance is of high importance at old age, due to the risk of falling. Many of them liked hiking in the past and present, the

difference is that hiking outside is less of an option the bigger the impairment gets. The attitudes towards exercising are somewhat similar to the attitude while gaming, elderly people do not want to be overstrained or see where they fail, they want to see their progress and what they are capable of doing.

Which are the technical requirements that need to be met?

- The possibility to choose difficulty and speed levels, for each person
- The story of the game should relate to real life
- The possibility to interact and communicate with family and friends in and outside of games/exercises
- The possibility of following progress
- A simple and intuitive interface
- Benefit of exercises/games should be explicit
- The possibility to play/interact/communicate with limited fine motor skills
- The possibility to play/interact/communicate with limited eyesight
- The possibility to play/interact/communicate with limited mobility (sitting down)
- Cultural offers
- Rules of the games should not be complicated
- The possibility of advanced gaming when the basic rules are clear
- The possibility to play cooperative and competitive
- Known elements ease the access
- The possibility to play/interact with strangers
- The possibility to do specific exercises
- The possibility to correct ones mistakes
- Layout/graphics should be adequate for elderly
- Data protection (possibility to choose which data is available to others)
- Visibility of other persons participating

How can the elderly be attracted to digital media and to the social platform

In the proces of user involvement trust turned out to be an important aspect. Trust is the basis for further work.

Technologies have to be adequate, on one hand they have to be adapted to users' needs, on the other hand it is important for the users that the new technologies have a clear benefit. The benefit can range from social inclusion, fun to a mental/health benefit. Once the adequacy and the benefit are given and adapted to the users the acceptance of digital media or new technologies is increased.

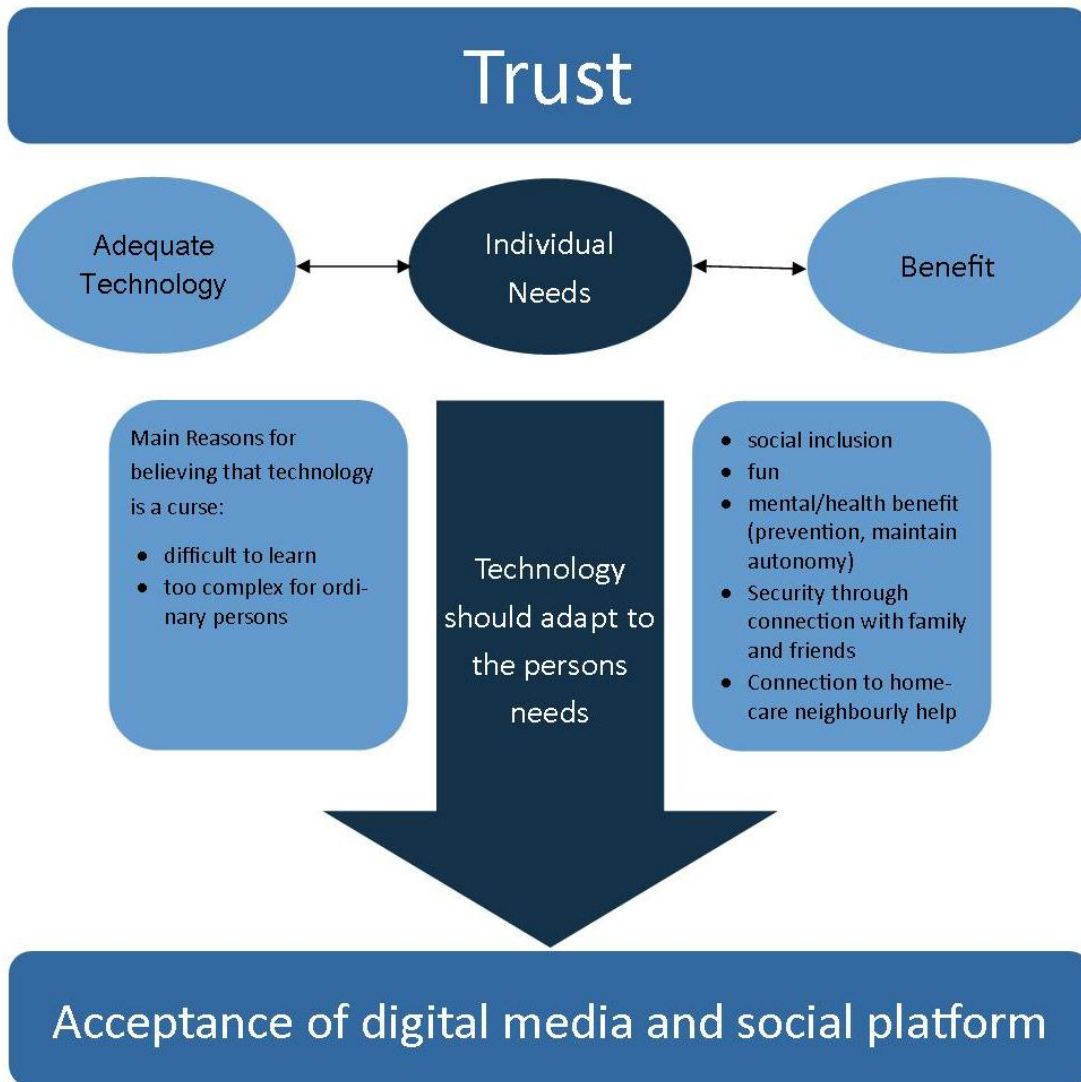


fig. 6 Process of acceptance of new technologies

4 User Requirements Hungary

4.1. Involving the users

User involvement is essential for the Join-In project for a better understanding of the elderly's needs and their attitude towards new ICT technologies. In Hungary the average computer usage in the targeted group is very heterogeneous depending on the social-cultural background, education level and financial status. In general just 12% of the 65-74 year-old population in Hungary use computers on regular basis⁴⁹.

This means that the user involvement has another important role, i.e. the education of the user groups on info-communication technologies. Thus our research focuses on the continuous education and involvement in the Join-In project. The sub-contractor of Bull, the Hungarian Johanniter Charity Service (JOH) is organizing the user involvement and the research of the user requirements analysis.

The analysis took place in three different types of settings for the better understanding of the users' needs, and to help the production of the regional Business Plan for the project.

4.1.1. Johanniter Charity Service

The Johanniter Charity Service (JSSZ – Johannita Segítő Szolgálat) is a countrywide charity service of the Order of Saint John, and the member of the Johanniter International, the international organization of the Johanniter Charity services in Europe and Jerusalem.

In the Join-In project the JSSZ organizes through its network five user groups in the capital city (Budapest), in small towns (Balatonalmádi and Szombathely) and in a small village (Hencse).

The JSSZ is taking part in the project with the expectation that the final product of the Join-In will help to develop the organization of the Elderly Care Mission.

4.1.2. Key persons

At every user-site there is one local member voluntarily involved in the project. These key persons are responsible for the outsourced equipment, the success of the user involvement.

They are also contact persons for the user involvement because of their knowledge of the user-groups.

4.1.3. Serial Focus group

The serial focus group in Hungary is recruited from the Pensioners' Club of the Sylvester János Protestant High School. The focus group is made up of retired teachers of the

⁴⁹ p. 65. In: Ezüstkör – Időskorúak Magyarországon, 2010 (*Silver-Age – Elderly People in Hungary, 2010*), Központi Statisztikai Hivatal (Hungarian Central Statistical Office), Budapest, 2011.

school. Their user involvement sessions are taking place in the school, where the JSSZ has its laboratory room for testing the Join-In developments.

The site is located in Budapest, and the members of the group are highly educated, and familiar to computers and the internet.

4.2. Research Design

JOH and JSSZ have set up five different user group centers, in five different regions of Hungary. Two are in the main urban area of the Hungarian capital, two in towns in the countryside, and one in a rural area in the south-western part of Hungary. In these regions at least 100 users are involved in the piloting of the Join-In project products.

The sites are located in Budapest (2 sites), Balatonalmádi, Hedrehely and Szomabathely. Other communities under the JOH networks are subjecting homebound individuals, who need regular maintenance from the JSSZ. These groups are located in the rural areas of Hungary.

The sessions with the user groups take place weekly in Budapest and bi-weekly in the countryside. The sessions last 1-4 hours depending on the number of the participants, but the goal is that every user tries the activities offered at least for 10 minutes in each sessions.

The questionnaires are completed with the help of the volunteer/key person of the specific user group.

4.2.1. Research design by Sites

4.2.1.1. Budapest –Békásmegyer

In the northern part of Budapest, in Békásmegyer, in the facility of the Hungarian Maltese Charity Service, the Pensioners' Club of the local area the weekly gaming sessions is held every Monday from 9 to 13 o'clock with a lunch break. The participants are recruited from the Pensioners' Club. Every session has been attended by 10 up to 20 persons. The total size of the club is 40 elderly people.

During the first session they got a description of the project, and were asked to complete the questionnaire.

In the weekly sessions a key-person and a JSSZ member are present, and guide the exergaming.

4.2.1.2. Budapest – Sylvester János Teachers Pensioners' Club

The user groups meet weekly, every Thursday afternoon, for a three hour gaming session. The users are very curious about the new technologies. Each time about five persons (the total number of the group is 12 persons) are joining the session.

Each meeting includes a gaming session and a discussion on the games presented.

4.2.1.3. *Balatonalmádi – Reformed Church Social Centre*

This site is a small city on the coast of Lake Balaton, which is traditionally the target of the tourism in the summer time.

The key persons of this site are the local priest and his wife. They are using the Join-In user involvement as part of the community building element of the church. The church has an elderly club with weekly two exercising meetings.

The user involvement sessions are regularly taking place on every second Thursday from 16:30 for one or two hours long. The total number of the club members is 20.

4.2.2. Research Method

The methodology uses the quantitative data, from the filled out questionnaires and the qualitative data of the group discussions of the serial focus group, the interviews with the participants and the observations of the key persons.

4.2.3. Research Findings

4.2.3.1. *Age, gender and social status*

The first questionnaire was about the background of the participants. We asked for gender and age, and about their preferred exercising activities, now and in the past.

46 persons have - so far- filled out the questionnaire: 33 from the two sites in Budapest and 13 from the countryside. It turned out that the majority of the participants are female.

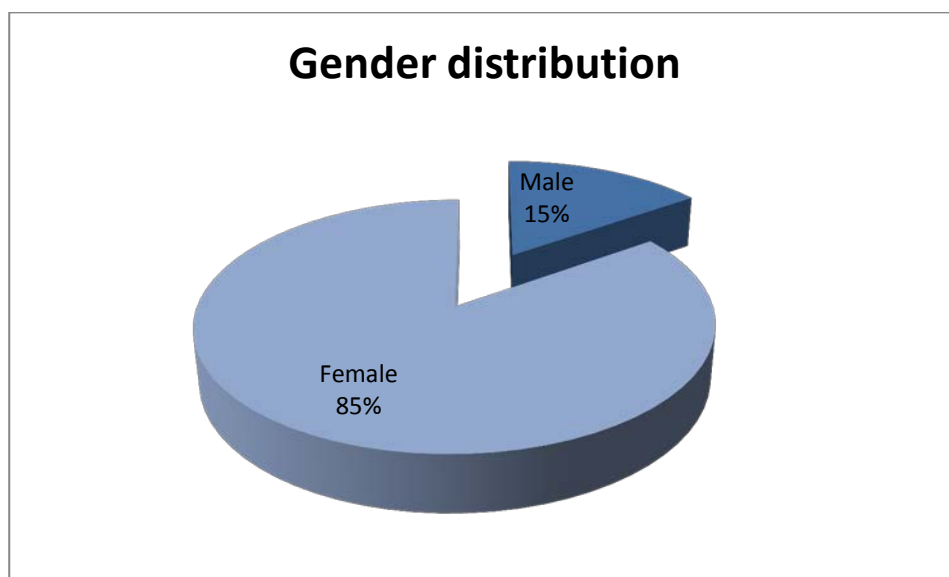


fig. 7

The average age of the participants is 68,9 years. The mean age of the users in the urban area is 5,4 years older than the ones in the countryside. We found that, thanks to to more developed elderly care in Budapest, the elderly live in their homes much longer than in the countryside. Also the transportation infrastucture is incomperable in the two areas, wich makes the urban enviroment much easier for the elderly to live in.

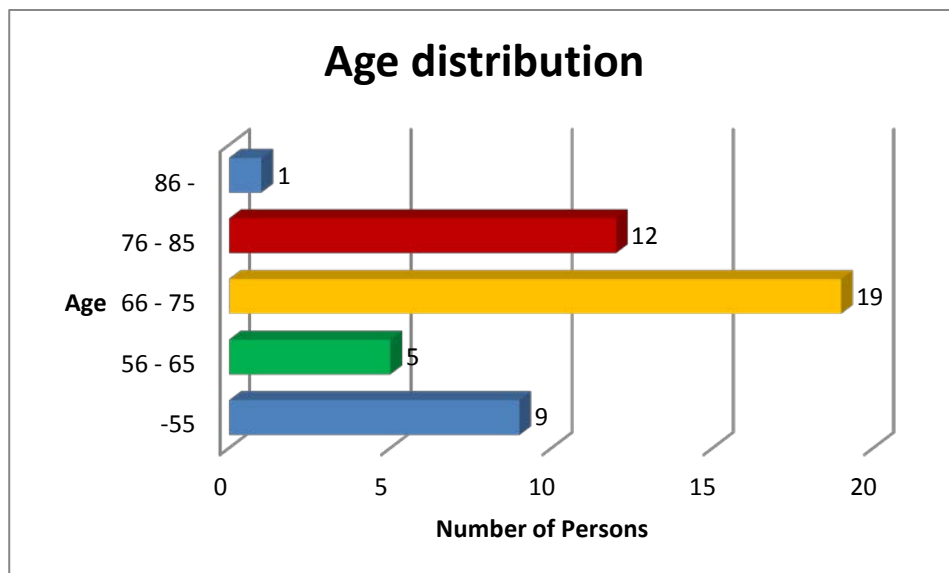


Fig. 8

4.2.3.2. Fields of interests

To analyze the preferred exercising or sporting affinity, we asked the participants for their loved and favorite sports they played in the past, even in their childhood. That showed us that the elderly participants had five major exercising hobbies: cycling, tobogganing, athletics, ball-games (mainly football, handball and basketball) and hiking.

Some connections were found between dancing and skipping-rope, which is a very interesting association from the participants, because in Hungary the rope skipping is a common game for children especially for girls.

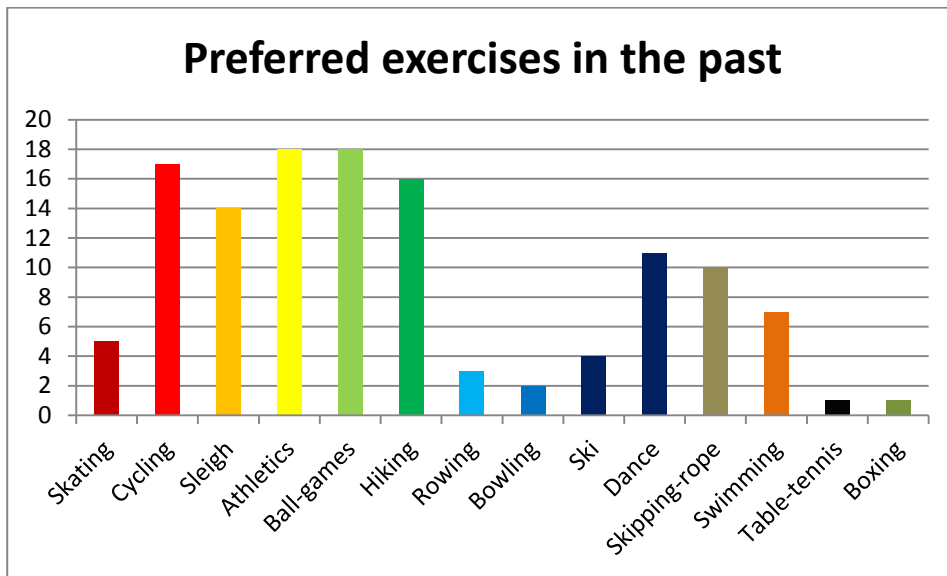


Fig. 9

After the first gaming session we asked the participants about which would be their favourite activity if they were not disabled. Surprisingly the majority of the users answered that if they could they would like to learn skiing or go skiing again. Swimming, cycling, hiking and skating also showed significant affection among the users.

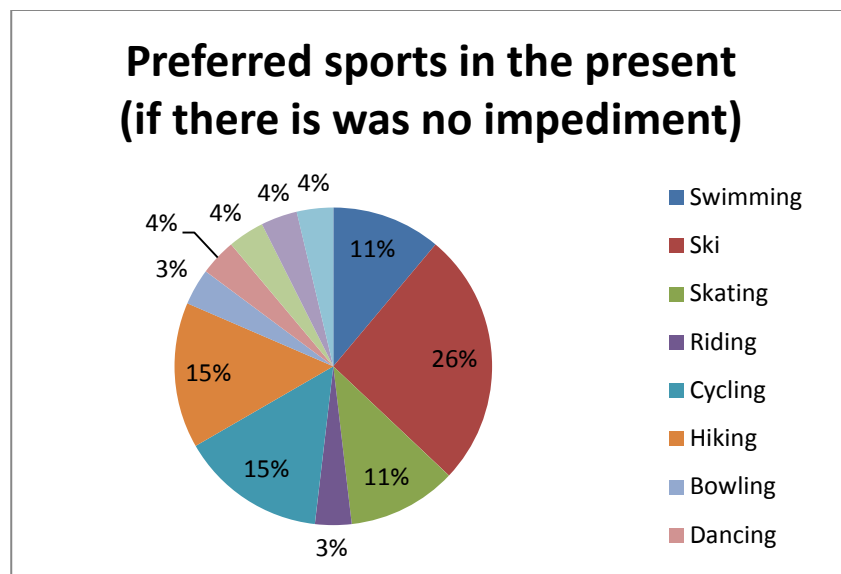


Fig. 10

4.2.3.3. Exercising

In the Join-In project one of the major goals is to activate elderly people to do more exercising in fun activities to prevent them from social and physical deprivation. For that we asked the participants to tell us if they do any kind of exercises regularly. It was surprising that almost two-thirds of the respondents are regularly exercising.

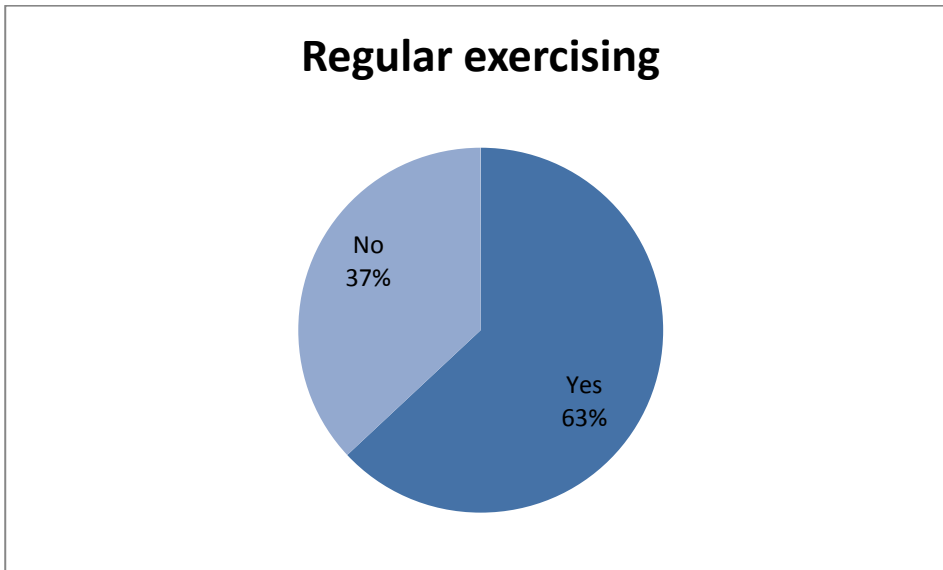


Fig. 11

To describe this data we asked the users to tell us the type of exercise they did. We found out that 20% (9 persons) had been exercising during orthopedic care in a hospital. So that fig.11 shows that more than half of our users stated to exercise regularly in prevention of their health.

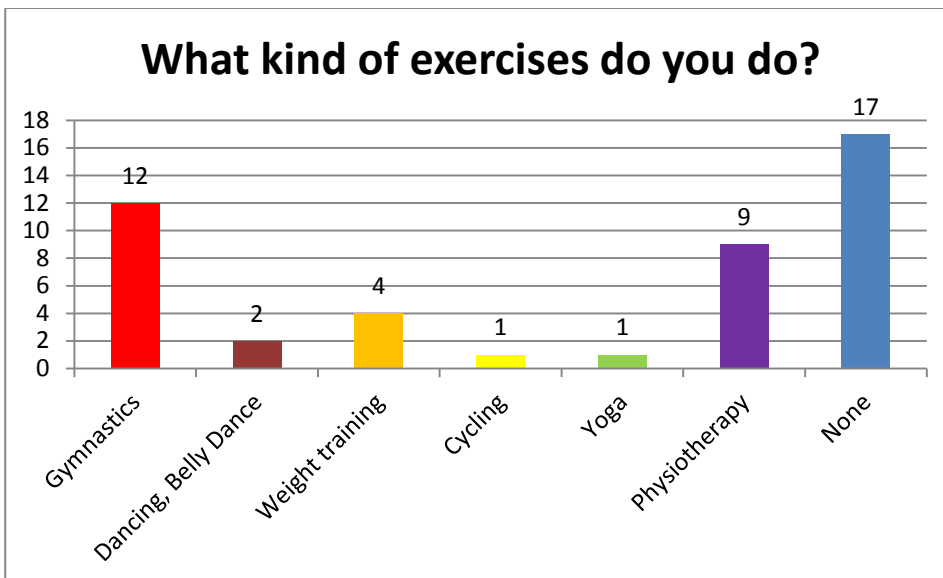


Fig. 12

When asked about the frequency of home exercising ten of the participants did not give any response. We enquired further and the users told us that they feel they are exercising, but not in any specific place, but, as they said, e.g. „going to the supermarket and coming back home is also an exercise”.

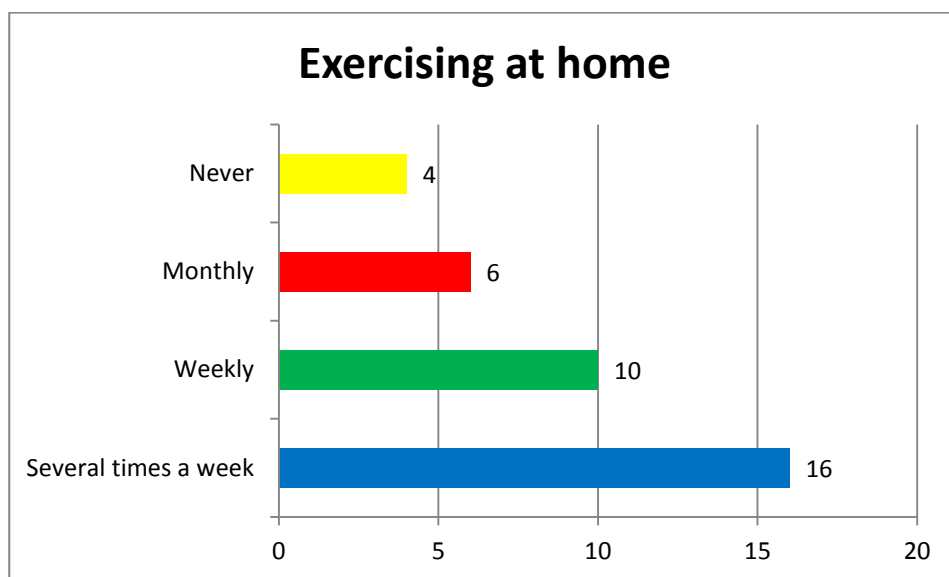


Fig. 13

In general, the full picture is not as good as the quantitative data suggests. Supplemented with discussions and interviews we found that the elderly have a wide definition of “exercising”. We believe that the reason for this is that everybody is aware of the importance of regular exercising for preserving a good health status, but that the target group does not want to see themselves as self-destructive persons.

We can conclude that more of the half of our involved users do not exercise in; however 20% of them regularly need professional orthopedic care taking.

4.2.3.4. Exergaming

During user involvement we tested Wii Sports, Wii Sport Resorts, Wii Fit Balance board and the Wii party games. When testing the English language provided difficulties, because the only user group that could overcome the English instructions and settings of the Wii games was the serial focus group, where most of the users speak English as a second or third language.

Another barrier was the use of the Wii Remote. Most of the elderly users found it hard to use the controller with only one hand. The reason of that is it that with the age the anatomy of the human hand is changing especially with arthritis. This means that the users cannot grasp the controller in a way that enables them to use the front and backward buttons at the same time.

To overcome these barriers intervening supervision was needed from the session leaders in every gaming session to not discourage the participants in the future participation.

However, the were totally disinterested users in most of the games, the ones they liked gave them a boost on the motivation to test more and more games.

The questionnaires' data showed a very positive picture about the Wii console in general, but it also showed that the Hungarian elderly do not want to play alone with the console. In the personal discussion we found that this unwillingness to play alone roots in the difficulties of the setting up and language difficulties, and does not mean that they do not want to play the game itself alone.

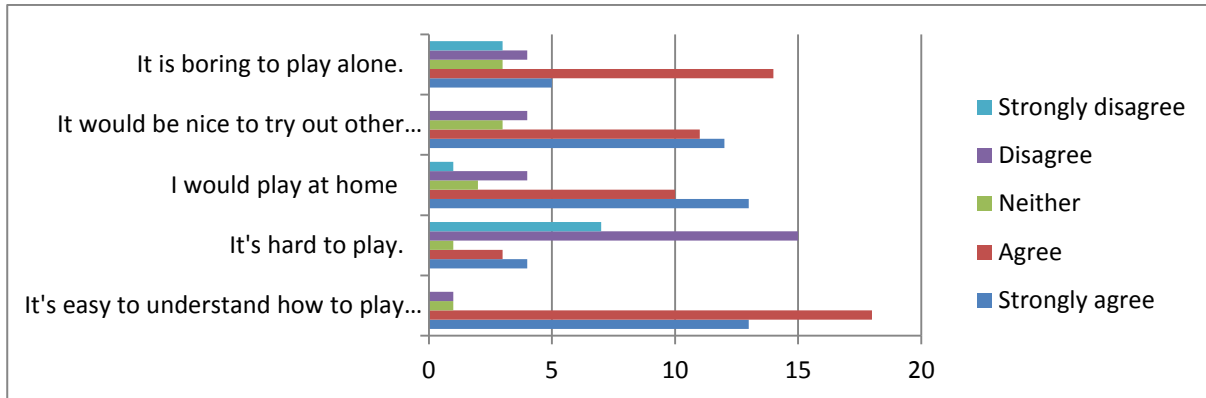


Fig. 14: Singly using of the Wii console is indicates fear

4.2.3.5. New Technologies, Communication and Network

For drawing a picture on the acceptance and actual behaviour about the so called “new technologies”, the investigation was expanded to the mobile phone and to computer using behaviour.

Most of our participants own a mobile phone (89%), but the majority uses it only for phone calls. Even writing short messages is hard for the target group.

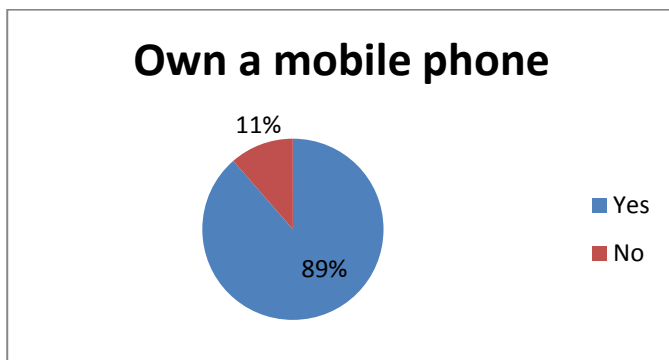


Fig. 15

The main reason for having a mobile phone is to be in touch with the descendants. It was a very typical sentence in the interiews that „my daughter going to kill me if I leave this (*the mobile phone*) at home”. The normal mobile using behavior is to only use it at home. Most of the elderly, who own a mobile, have an aversion against using the phone publicly, and most of the times the mobile phone has been brought by a son or daughter to give thse a feeling of security.

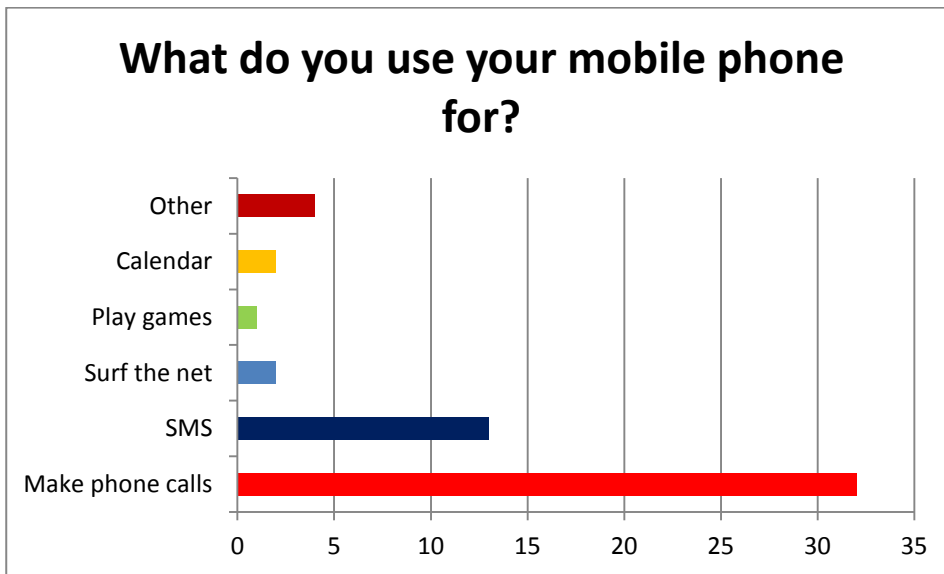


Fig. 16: Cellular phone using habits.

The personal computer penetration is 57,2 % in our usergroups wich is more than the national avarage. But only 42,8% of the overall population uses computers.

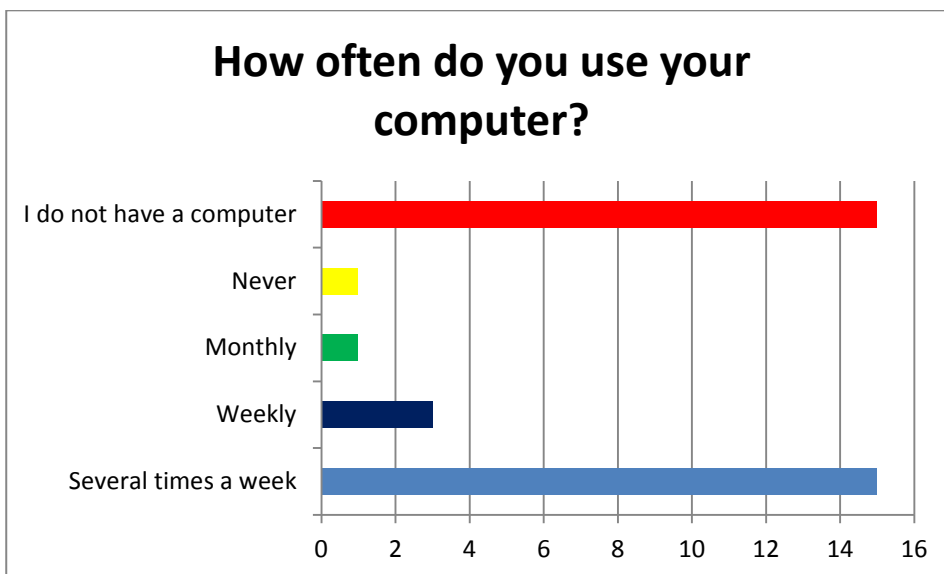


Fig. 17: 42, 8 % of the user groups do not have a PC.

The main motive to use the a computer is to communicate via e-mails, and to surf the internet for specific information. There are five participants using a computer to work on it.

Activities done on the computer for entertainment are gaming (mostly card games), and watching films.

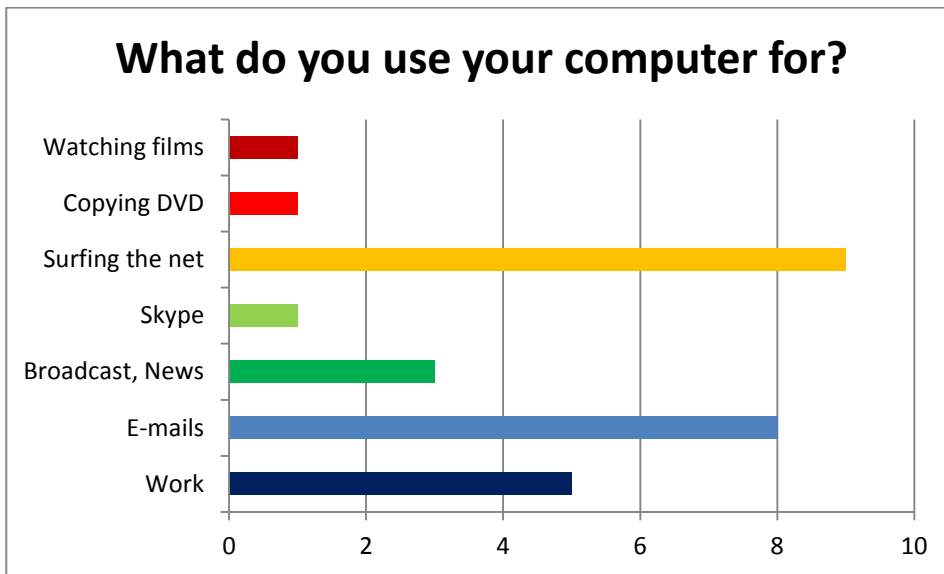


Fig. 18: What do regular users use their computer for (having used the computer at least once in the past month).

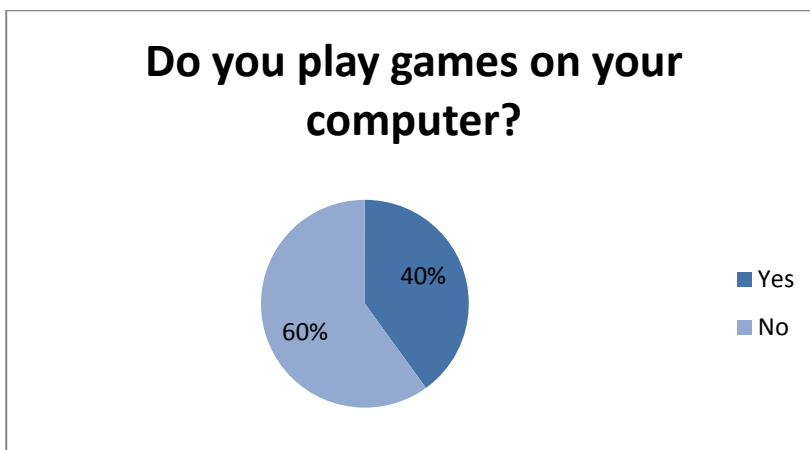


Fig. 19: Gaming within the PC owners

It is surprising that the users are very active in the social media platforms (facebook and iwiw), 30% of the participants are connected to one of the social networks. Compared to the computer owner percentage (57,2%) we can see that half of the elderly computer users are socially active online.

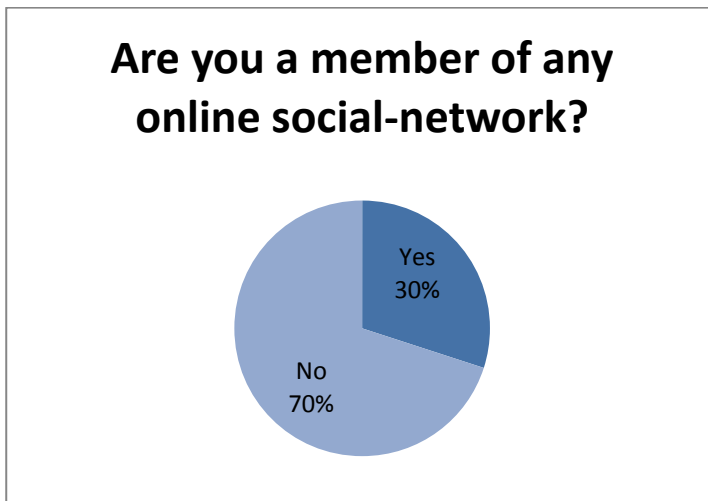


Fig. 20: Online social-networking within the user groups

In total most of the participants are aware of the usefulness of the new technologies and the use of the internet, but half of them find it difficult to use. There is a correlation of regular computer users (42%) and those who do not use computers (43%).

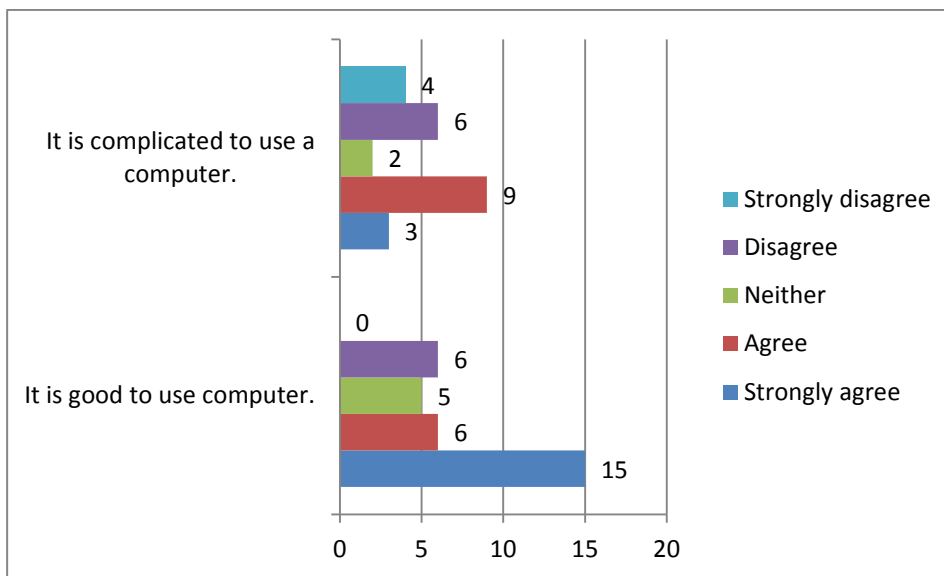


Fig. 21: How the participants feel about computers

4.3. Summary

In the testing period we investigated our users in urban and non-urban sites starting August 1st, 2012. The user involvement is still on-going in weekly and bi-weekly periods. This progress will continue during the lab-testing and the piloting period of the project. In the five sites a total of about 90 persons were involved. The requirement analysis was done with 45 persons in total. In Budapest 24 gaming and 2 introduction sessions were

held. In Balatonalmádi 1 introduction, 1 intergenerational and 4 elderly gaming session were held. In the other sites the user involvements were started.

For the questionnaires see Appendix H and I. The guide for the interviews is presented in Appendix J. The interviews were taken by the key persons from each site and by the workers of JSSZ.

The first analysis shows that

- The target group is aware of the importance of exercising, and is willing to learn the new technologies for preserving their health.
- The Wii Remote control is inappropriate for the target group's needs.
- The target group is scared of the unknown new technologies. However, for those who have learned how to use it, it has become a very useful tool for being in touch with others.
- The target group is very active on online social networks, if they have learned how to use the new technologies.
- Our analysis showed that of all the exergames tested: boxing, bowling, table-tennis, golf were the most popular.
- The participants also liked yoga and fitness exergaming with the Wii Fit Plus using the balance board. However, most of the movements cannot be performed; simpler and much more targeted exergames are needed.
- The key persons (especially the Senior Club leaders) are really satisfied with the exergaming, and they are eager to use the Join-In developments, or parts thereof to increase the elderly care level and to build communities by offering new activities.

5 User Requirements Ireland

5.1 Involving the users

The user group selected for testing in Ireland are part of the Active Retirement Ireland group located in New Ross, County Wexford. There are 110 total members of the group. The community meets regularly to take part in different activities such as bowling and dancing. Each member of the group can select the activities they wish to partake in. Some members of the group take part in activities 7 days a week. There were 14 members of the group who attended the user group testing sessions. The group is primarily female and range in ages from 55 to 85. The group has participated in two user testing sessions on the 6th May 2011 and the 3rd November 2011.

5.2 Research Design

5.2.1. Research Methodology

The research goal is to increase motivation of elderly users to play the Join-In game. Motivating the player will encourage them to play the game for longer and more frequently.

The hypothesis of this investigation is that certain elements in the game will lead to increased motivation. One such element is an adaptive difficulty component. Adaptive difficulty is a method of altering the difficulty level of a game based on the skill level of the player. This differs from a static difficulty model where the user must select the difficulty level before playing a game. Adaptive difficulty links into one of the key conditions of flow, matching challenges with a user's perceived skills.

An experiment will be carried out with two groups - one who use the game without the adaptive difficulty component, the other with it, the objective of determining whether there is a significant difference on motivation. After completion of the test, users will be asked to fill out a motivational questionnaire using an instrument such as Harter's Intrinsic/Extrinsic Orientation Scale⁵⁰. The result of this instrument provides a method of comparing the game with or without the adaptive difficulty component.

5.2.2. Game review methods

In order to establish a set of common features in commercial exergames, a selection of games were tested. The games selected were grouped into five categories of exergames: workout exergames, control exergames, sensory exergames, rhythm exergames and exergame machines. A set of criteria were devised to assess each video game by: motivation, enjoyment, intensity, approachability, usability, adjustability, social integration and familiarity. In depth details of these criteria can be found in deliverable 5.1

⁵⁰ Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components.

'Requirements and state of the art in exergames for the elderly, low-cost motion tracking and respective HCI for elderly'. Each criterion has at least one instrument, used to measure the degree to which a game has fulfilled it. For example an instrument used to measure a criterion is the 'GameFlow' model⁵¹. This model is used to measure enjoyment in video games.

A user group session was held on 3rd November 2011, where the games 'Body and Brain Connection' for the Microsoft Xbox 360 and 'Wii Play' for the Nintendo Wii were tested. The criterion usability was selected to compare the games. The measurement selected for usability is the Software Usability Measurement Inventory (SUMI) questionnaire. SUMI is a fifty item questionnaire answered with either: agree, don't know or disagree. The SUMI questionnaire is recognised by the International Organisation for Standardisation (ISO) as a method of testing user satisfaction. The SUMI questionnaire evaluates several elements of software that have an effect on usability such as usefulness of instructions, how mentally stimulating the software is and the number of steps required to complete a task.

A secondary objective of the user testing session was to measure the usability of the game controllers. The two input devices presented to the users were the Microsoft Kinect and the Nintendo Wii Remote. The initial findings of the SUMI questionnaire in relation to this objective were that the group found the Kinect to be an intuitive controller. The Wii Remote was described as being too fast to control and required too much precision.

5.3 Fields of Interest and research findings

5.3.1. General condition of the users

The results of a questionnaire designed to profile the user group are illustrated below.

Gender and Age Distribution

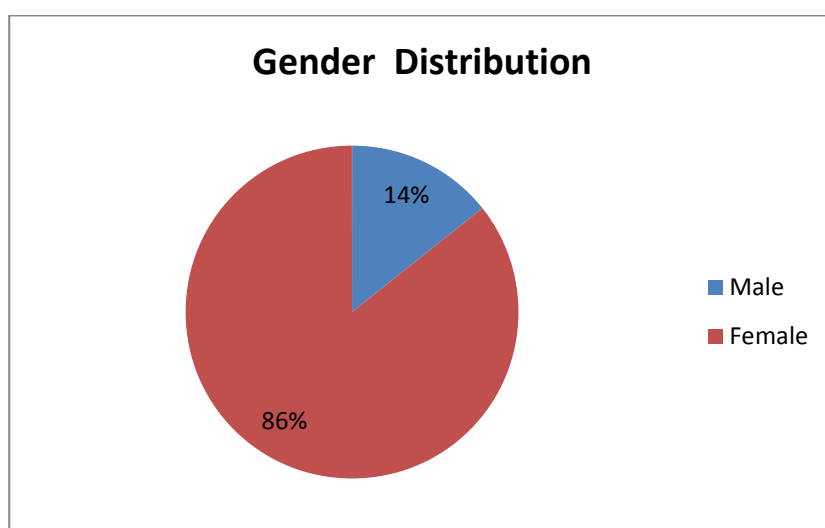


fig. 7 (Gender distribution)

⁵¹ Sweester, P. Wyeth, P. (2005) GameFlow: a model for evaluating player enjoyment in games.

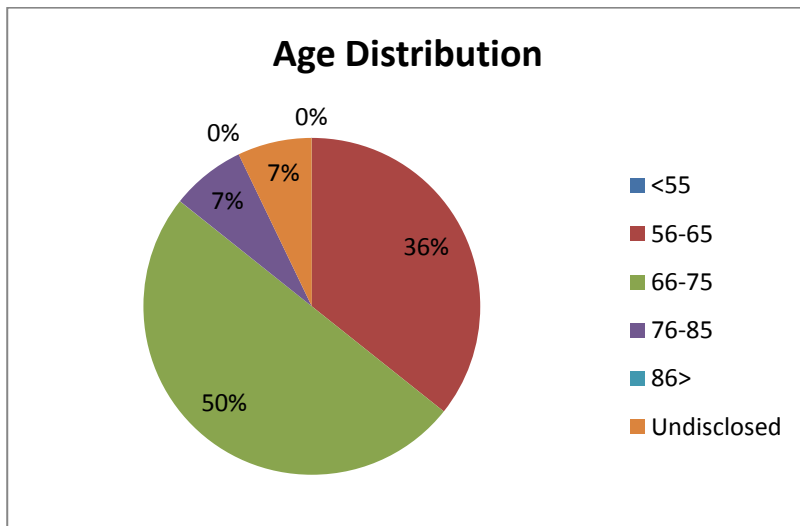


fig. 8 (Age distribution)

The results show that the group is comprised mainly of females (fig 7). Half of the group were in the 66-75 age group. There were no members in the under 55 or above 86 age groups who completed the survey.

5.3.2. Hobbies and favourite activities

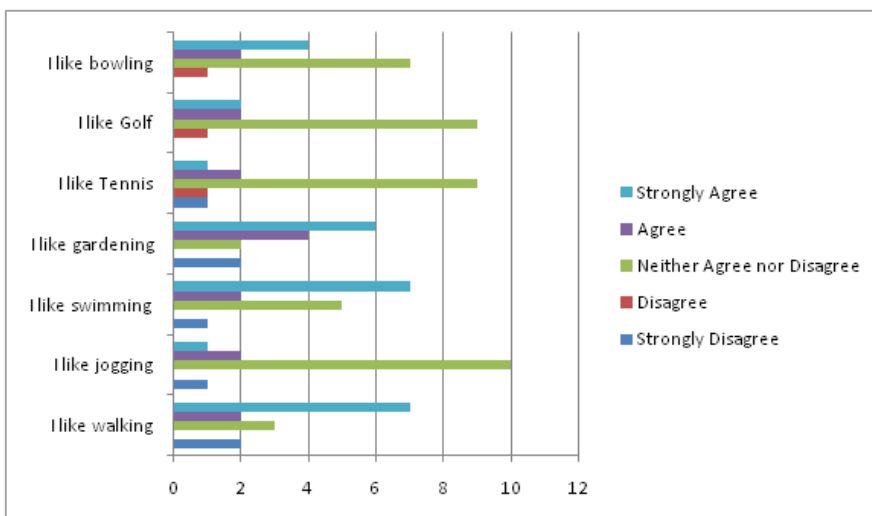


fig. 11 (Popular activities)

Walking and swimming were identified by the group as the most popular exercise (fig 11). Gardening was the second most popular activity and tennis was listed as the least popular activity.

5.3.3. Exercises

Exercise Routine

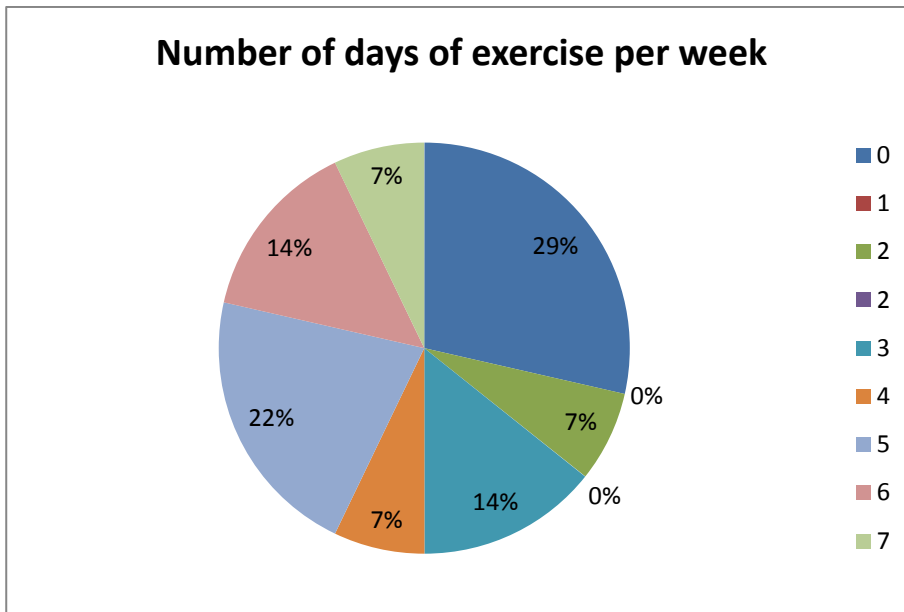


fig. 12 (Number of days users exercise per week)

Most of the users in the group exercise on a regular basis. Only 29% of the users do not partake in any exercise (fig 12).

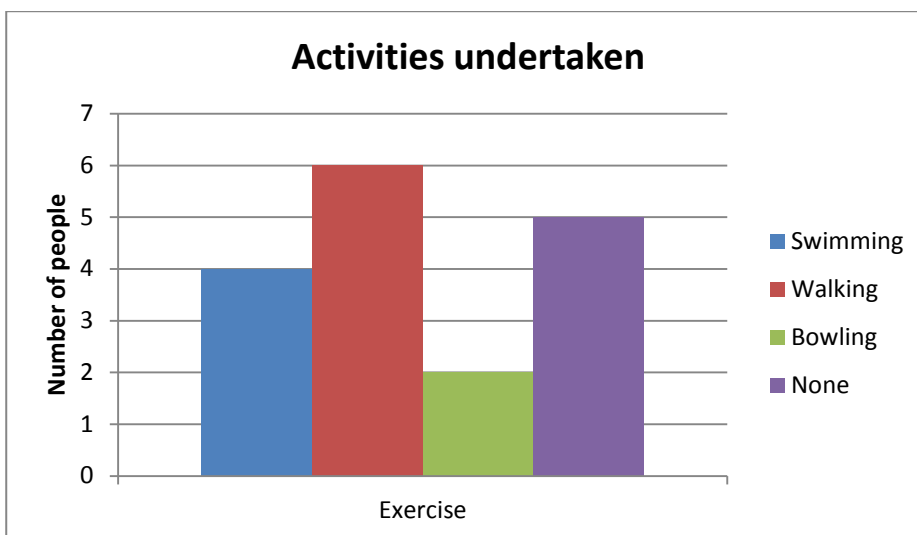


fig. 13 (Exercises the users currently partake in)

Walking was the most popular activity followed by no activity (fig 13).

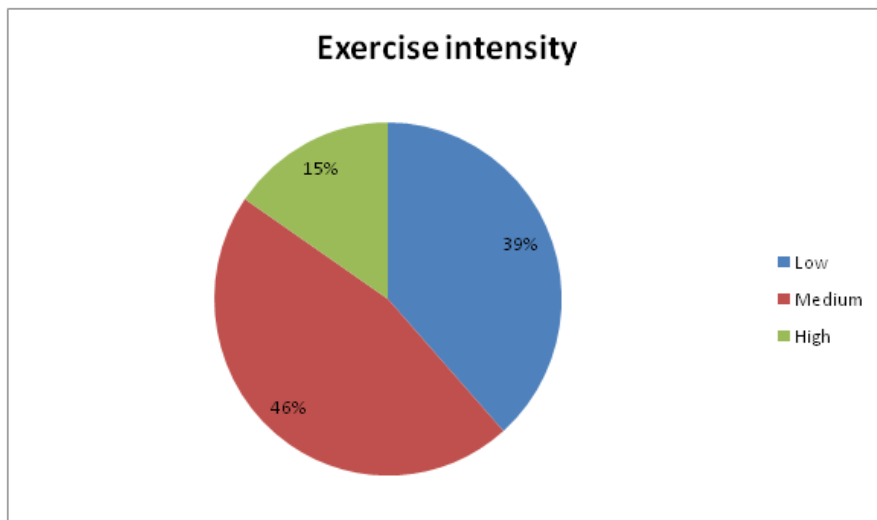


fig. 14 (Users perceived level of intensity of the exercise)

The results from previous questions established the types of exercise and the number of sessions a week each user participates in. The users were asked to rate the level of intensity of the exercises they partake in. 46% of the group selected medium as the intensity level of the exercise and only 15% felt the exercise they participate in has a high level of intensity (fig 14).

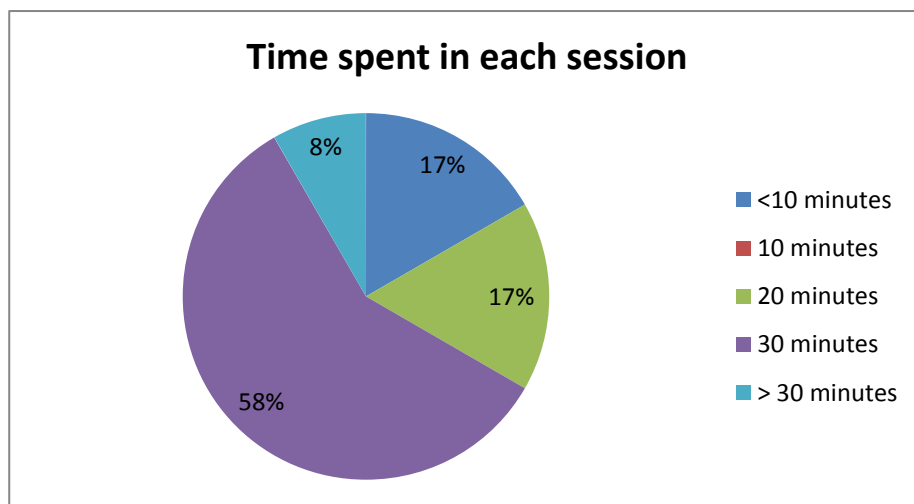


fig. 15 (Amount of time a user spends exercising during each session)

The group was asked how much time, on average, their exercise sessions last. The data shows that the majority of the users spend 30 minutes exercising during each session (fig 15).

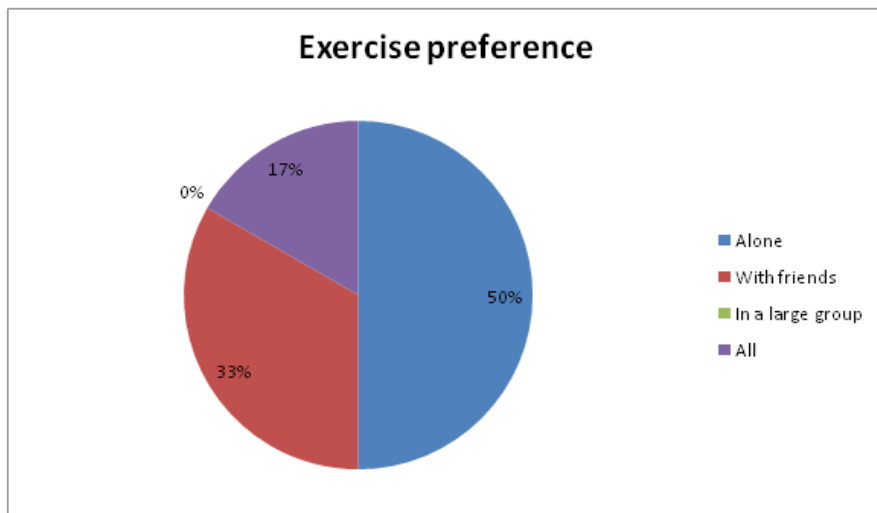


fig. 16 (Amount of people a user prefers to exercise with)

The final question was asked to determine how the users prefer to exercise with others. The data from this question can be used to judge how important multiplayer is to the users and the types of multiplayer that are important. The data gathered show that half the users prefer to exercise alone or with friends (fig 16).

5.3.4. New Technologies, Communication and Network

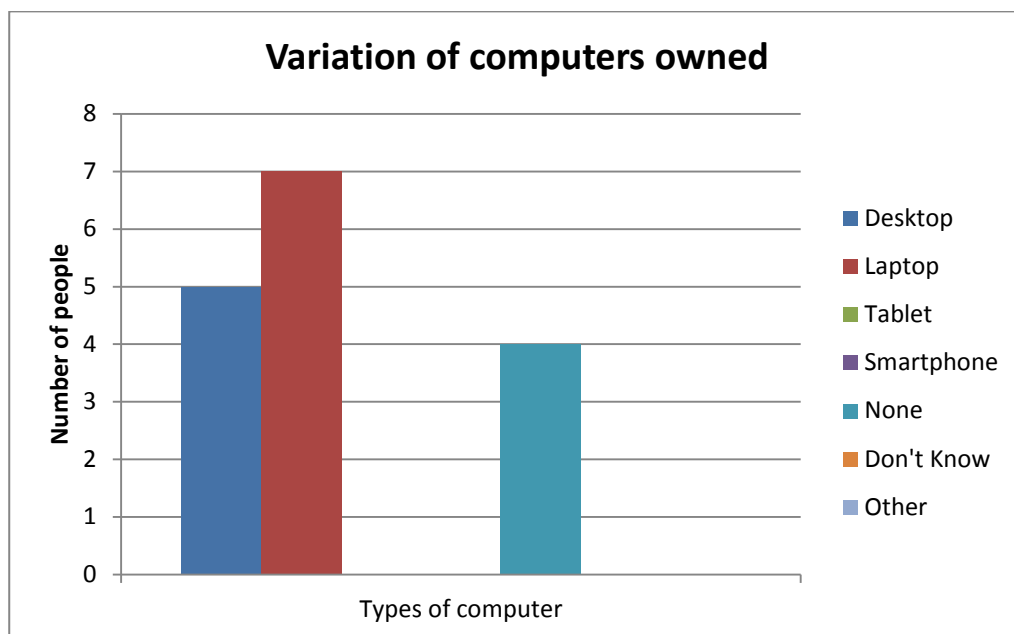


fig. 9 (Types of computers owned)

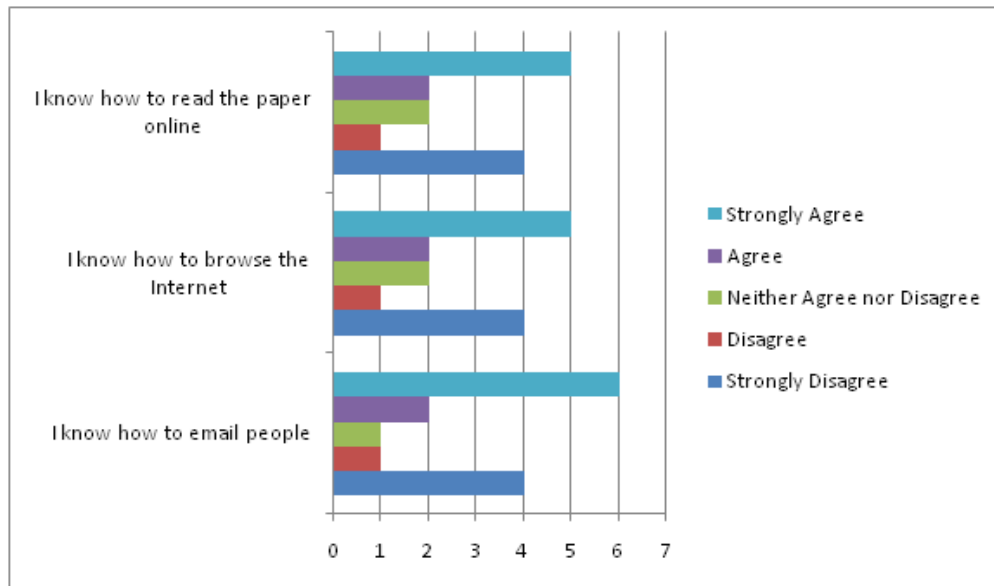


fig. 10 (Common uses of the computer)

The data obtained from the graph (fig 9) identifies that none of the members of the user group own a smartphone or tablet computer. Laptops were the most popular device followed by desktops. The majority of the users were confident in their ability to send an email, browse the Internet and read a newspaper online (fig 10).

5.4 Summary

The Irish Active Retiree group currently has fourteen members actively participating in the Join-In user testing sessions. The group is primarily female, aged 56-75.

Currently the group has participated in two user testing sessions which were on the 6th May 2011 and the 3rd November 2011.

It was discovered from the user testing sessions that the primary hobbies of the group are walking swimming and gardening. A quarter of the group interviewed did not currently partake in any form of exercise. The majority that frequently exercised preferred to spend 30 minutes per session. The data gathered showed that most of the group owned either a laptop or desktop computer. A quarter of the group didn't own any form of computer.

The research goal is to increase motivation of elderly users to play the Join-In game. Motivating the player will encourage them to play the game for longer and more frequently. The hypothesis of this investigation is that certain elements in the game will lead to increased motivation. The research question will address one of the elements of game flow. Motivation is the likely variable to be investigated.

Commercial exergames were reviewed to identify common elements. The games were assessed using the criteria: motivation, enjoyment, intensity, approachability, usability, adjustability, social integration and familiarity (see Deliverable D3.1). Validated and reliable research instruments are continuously being used to measure and contrast game elements to ensure the data gathered is valid.

6 User Requirements Norway

6.1 Involving the users

In Norway elderly users were recruited from the senior centre Heracleum, from the Norwegian Lung and Heart patient organisation (LHL), and from a pulmonary rehabilitation centre.

From Heracleum four ladies between 72 and 85 tested the Wii and 12 persons have filled in a questionnaire. The three youngest who filled out the form are in the 60s and have a computer and use it for surfing and gaming.

From the LHL and the rehabilitation centre ten participants, in the age group 70-90 years, half of them above 80 years old, were recruited. Five of them were computer users, of which one was a monthly user only. Eight of the participants were female, and two male. Nine used the mobile phone for voice call, and four for text messaging.

6.2 Research Design

Heracleum

The participants from Heracleum met for a lab trial. There were supposed to be four participants, but since one was sick that day, only three turned up. They were accompanied by an occupational therapy assistant. We first introduced the project, then the participants tested some games, and afterwards they went through a general questionnaire and commented on it. This questionnaire is the one that later was answered by 12 seniors at Heracleum (including the “exergamers”).

The main result of the training was that the ladies wanted regular Wii training at Heracleum. The project bought a Wii fit game with balance board, and the occupational therapy assistant who accompanied them at the trial is now organising weekly Wii training session. After some training sessions, two of the participants were interviewed (2 were sick). The assistant has also been observing the ladies, and her observations are part of the results.

Since there is only one TV screen and two Wii motes, only four users have been attending the groups. It is planned to recruit more seniors, since such a small group is very vulnerable.

LHL and the rehabilitation centre

The participant groups from LHL and the rehabilitation centre met for one lab trial day each. The purpose of the lab trial was to get feedback on exergames, and to acquire

background information on the participants' usage of technology, and their exercise and board- and card games habits and preferences.

The lab trials for the two groups were arranged in the same manner. The participants did exergame testing (a selection of Wii exergames); they answered questionnaires individually, and took part in a focus group session at the end of the day. Questionnaires were developed for the lab trial. The exergames questionnaire has a five point Likert Scale, while the other questionnaire combined multiple choices and free-response items.

6.3 Fields of Interest and research findings

Heracleum

From the questionnaire 12 persons filled in a general questionnaire, 6 of each gender between 63 and 85 (average 75).

- Just as in Germany, the participants have many interests, 3 even answered “surfing on the internet”. Handicraft of different kinds (knitting, porcelain painting, carpentry, etc.) is important, but they also like film, theatre, reading, music, etc. Many also like walking and cooking.
- 10 out of 12 respond that they have mobile phones. Out of those 6 use it for texting, 2 use the calendar function and one uses the phone for gaming. All uses it to call. None of them find it difficult to use the phone.
- Only 4 of our respondents have a computer, and one of them never uses it. The three others uses it daily. The computer owners use their computer for e-mail (2), Internet (3), banking (1) and games (2). One is also using social media.
- When it comes to exercises, some attend regular exercise outside of their home while some exercise at home. 3 also replied that they could consider using exergames at home.
- 50% of the respondents (6) were performing sport when they were young.
- Only three of the respondents play card or board games, either with grandchildren, friends or acquaintances but they are mostly sporadic players. .

From the discussion after some gaming sessions

Due to illness, only two out of the three players participated in this discussion.

- The Wii playing ladies have mainly been playing games from the Wii fit. They have not used buttons on the Wii mote since they have not played games requiring input other than movement, and the occupational therapy assistant has always been there and set up the games for them. The Miis were made in advance, but they actually partly could guess who was who based on hairdo, glasses, etc.
- The users have tried slalom, table tilt, walking, hula hoop and boxing (from Wii sport). Their favourite games are slalom and table tilt. They also like the walking game. None of “our” ladies liked hula hoop as kids, so they did not like it now either,

they find it too difficult to master. They also do not like boxing as a sport, and, therefore, do not want to play it.

- The users find slalom fun, they feel that it has an effect on balance and flexibility, and they like to get an insight in what it is like to perform this sport. The table tilt game is perceived as fun and challenging, and also good for balance and flexibility. The walking game is fun, because “we can make teams and compete”. They sometimes cheer two different local football teams when they play the walking game.
- Since they have not used the buttons on the wii notes, our questions “is it difficult to play” is tied to how easy it is to achieve the goals in the games. Both of the ladies said they find game-play easy. One of the ladies does not think that she would like to play at home, but the other one might under certain conditions. Both ladies find it fun to use avatars when playing. One of them would like to play alone and would like to learn how to do it (85 without a computer and no interest in using a computer). The other one would not like to play alone.
- We also asked what was important when we make a new game targeted at seniors. They particularly want to train balance and flexibility, and due to health conditions it is important that they can exercise at their own speed and take breaks when they want to.
- The seniors don't care whether the surroundings are real or fantasy as long as it looks nice and suits the game.
- When asked whether they like to compete or cooperate, they say “both, please”! They rather cooperate in teams that compete. They also prefer to exercise with friends rather than peers. They could not imagine who in their families they should exercise with.
- They also prefer to see avatars and not each other if they play together over a distance (“I know which avatar is you!”).
- They want a simple user interface in Norwegian, and preferably feedback and instructions that are both visual and in audio.

Additional comments from the occupational therapy assistant

- The assistant, organising the training says that the players get more alert when they play, they have a new challenge and they have to concentrate.
- Otherwise her observations are in line with the results from the meeting. The ladies feel that playing Wii games is useful for their health, one of the main motivating factors for this age group.

LHL and the rehabilitation centre

- The results show that four out of the ten participants were playing board games. They were playing with (grand) children, and not with other adults. They were either playing at home, at their cottage, while on trips, or during visits.

- Four out of the ten participants were also playing card games. Two were playing with (grand) children, and two of them did solitaire (alone). Again none were playing card games with other adults. They were playing at home, at the cottage, on trips, or during visits.
- In their younger years they played board and card games like; Ludo, Chinese Checkers, Monopoly, Whist including variations, Cassino, Yatzy and Dame.
- Current interests (activities and hobbies) include watching film (six out of ten), sewing and knitting (five out of ten), gardening (one), photography (one), genealogy (one), music (one).
- All were exercising regularly.
- Exergaming was well perceived by the participants at the lab test. The majority stated that they would like to do exergaming at home. They also imagine it fun exercising together with others using avatars.

Statistics computer usage elderly Norway

Statistics on computer usage in Norway (SSB, 2. quarter 2011) for age group 65 – 7452 show that 75 % have Internet at home, 49 % is using a computer nearly every day, 12 % at least once a week, and 4 % at least once a month. 57 % were using the computer to do Internet banking, 13 % for social media, and 52 % for reading newspaper online. Especially the use of social media is low for this age group.

6.4 Summary

Heracleum

The senior centre offers a wide range of activities such as different kinds of handicraft, dance session, entertainments, educational speeches, a café, a shop for selling handicraft, hairdresser, etc. They also maintain a day centre for elderly who cannot come by their own means, including people with dementia. The users that have answered our questionnaire are a heterogeneous group both when it comes to age and interests. They include people who have never touched a computer, and those who play games on a mobile phone. One also plays cards regularly.

The group that tried out the Wii game, belong to those who do not use computers. One is even in an early stage of alzheimers, but they all liked playing so much that they themselves wanted to play on a regular basis organised by Heracleum.

⁵² The oldest age group in the statistics. This is also the oldest age group for the Eurostat statistics

The LHL and rehabilitation centre

All of the participants were older than 70 years, and half of them were computer users which is comparable to the national average. There were few board or card game players among the participants. Those who do, play with grandchildren or other children. Their current activities and hobbies include watching films, sewing knitting and exercising.

The participants perceived the concept of exergaming very well.

7 Consolidated Summary

Elderly people are often less experienced in the handling of new technologies than young people and many of them mistrust new things. We learned that elderly need regularities and feel discomfort when a regular agreement or appointment needs to be changed. Key persons are to be trusted by the users, they feel understood and they cherish their opinion. In the project the key persons provide the link between users and research.

Taking the view of the users into account, one can distinguish between the expectations of the users and things that should be considered:

- ❖ It should be considered that elderly people often lack understanding of newer ICT; they did not grow up with the new technologies. One of the participants of the serial focus group said “Some elderly people find it hard enough to operate a microwave oven or the remote control of a new television”.
- ❖ It should also be considered that elderly want things to have a purpose; elderly people tend to classify things as useless if they do not see a direct purpose. Impractical and unhandy technologies have the risk of not being accepted by elderly people, especially if they do not meet their demands and show no value for daily life.
- ❖ Furthermore different disabilities have to be considered, such as bad eyesight or arthritis. It is important to know that speed is discouraging. When things happen in a fast manner and elderly people cannot follow the course of events it lowers their motivation of pursuing whatever activity.
- ❖ The main expectation or wish that elderly people have towards new technologies is the preservation of human contact.
- ❖ Elderly users are afraid that new technologies to take control of their lives.
- ❖ Simple structures are very important as well as different levels of difficulty. Adaptability of tools is also important when competing with younger people, e.g. grandchildren. Due to the heterogeneity of the group the capabilities of the single persons are also very heterogeneous. It has to be taken into account, that elderly people do not want to be overstrained nor under challenged.

New technologies offer the possibility of enhancing the quality of life. The approach on introducing the new technology depends on the technology experience of the users and on the background⁵³ of the user group. A subtle approach proved to be very important when bringing new technologies closer to elderly people who are computer illiterates – as most of 70+ are. A subtle approach strengthens the trust and increases the motivation, especially with persons that had not been confronted with new technologies before. The present generation of elderly persons is not as accustomed to ICT as are the younger generations. Especially in Germany and Hungary it showed that fears regarding new technologies are often combined with the fear of technologies taking over human contact. However, it is important to note that the approach might be different from group to group and it needs to be adapted to each individual group.

Some results were unexpected, for example the amount of new televisions amongst the users of the senior club I in Germany. The users from Hungary are very active in the social media platforms, 30% of the participants are connected to Facebook or iwiw. 89% of the users in Hungary own a mobile phone.

Many results were similar on an in the different trial sites' group results, but not all of them are comparable due to age factors and different preconditions.

The hobbies and interests of the user groups in the involved countries differ. While gaming with peers is of high importance in Germany, the users from other countries do not play with peers as often. The indoor interests of the users are very similar, they like reading, music, cultural activities and handcraft.

The gaming activities are very different among the user groups. In Germany two thirds of the participants of gaming sessions play at other occasions (6 out of 7 wii-testees play on other occasions). In Norway one third of the participants in the user groups play board or card games, but mainly with grandchildren.

Most of the users exercise on a regular basis: in Norway 8 out of 12 at Heracleum and 10 out of 10 from the LHL and the rehabilitation centre, 26 out of 30 in Germany, 26 out of 36 in Hungary and 71% in Ireland. The importance of exercising is very clear to all involved users.

The approach to test exergames was different from one site to another. In Germany a slow and subtle approach was necessary. The tests were conducted with two participants, later on these participants functioned as multipliers. In Norway the LHL, the Heracleum and rehabilitation user groups participated in a lab test day. The participants in Ireland were asked to try out exergaming with the Wii and with the Kinect. Not only did the approach differ from country to country but also the preferred exergames. While slalom and table tilt were favourites amongst the Norwegian players, the German players preferred Bowling, Ski Jumping and Obstacle Course. In Hungary the favourite games amongst the users were boxing, bowling, table-tennis and golf. None of the participants liked the Hula Hoop

⁵³ Why are they in the user group, what connects them, who are the key persons, connected to the research, etc.

and all of them found it important to be able to compete and to be able to cooperate during a game.

The Computer usage varies depending on the user group. 4 out of 12 users from the Heracleum have a computer and 3 use it. From the LHL and the rehabilitation centre 5 out of 10 were computer users. 12 out of 16 users in Ireland own either a Laptop or a Desktop. In the case of the German users there is also a difference between the wii-testees , 3 out of 7, and the participants of the senior club. Here only 5 out of 24 have used a computer. In Hungary 57,2% use a computer. The official statistics of internet usage also vary between countries. In Norway 75% of the persons between 65 and 74 have Internet access at home, in Germany it is only 41%, in Hungary 31% and in Ireland 20%⁵⁴.

The groups of elderly people vary depending on age, health situation and social network. What all have in common, is that the access to new technologies is through an obvious benefit. The results of the research are the foundation for a methodology of how elderly people can be attracted to digital media and to the social platform. This methodology will be developed in the course of the project.

Over all it must be said, that the needs of the users are similar in all participating countries. The analysis led to following requirements:

- ❖ The new technologies must be beneficial
- ❖ The new technologies must be easy to use
- ❖ The user interface has to be clearly arranged since the actual generation of elderly is not used to a “windows menu structure”
- ❖ Different age related limitations have to be taken into account (e.g. limited fine motor skills)
- ❖ The interests of the groups should be met on a regional basis. The local reference is very important for the elderly.
- ❖ The exercises should not be too fast or too difficult
- ❖ Different levels of difficulty make it suitable for a wider range and more interesting for each participant
- ❖ Negative Experiences result in rejection, elderly can therefore not be confronted with inadequate solutions
- ❖ Things that relate to real life ease the access to new technologies
- ❖ Data protection issues have to be explained (e.g. negative propaganda of Facebook)

⁵⁴ Cp. Statistisches Bundesamt 2011

Specifically related to games:

- ❖ Rules should not be complicated
- ❖ advanced gaming when the basic rules are clear
- ❖ cooperative and competitive game play
- ❖ specific exercises with a clear benefit
- ❖ correction of one's mistake – they should not fear that they will damage the solution

8 References

- Basak C, Boot WR, Voss MW, Kramer AF: Can training in a real-time strategy video game attenuate cognitive decline in older adults? *Psychol Aging*. 2008 Dec; 23(4): 765-77).OE24.at
- BMFSFJ (2001): Dritter Altenbericht: Alter und Gesellschaft
<http://www.bmfsfj.de/RedaktionBMFSFJ/Broschuerenstelle/Pdf-Anlagen/PRM-5010-3.-Altenbericht-Teil-3,property=pdf,bereich=bmfsfj,sprache=de,rwb=true.pdf>
- Bertram, Hans (2000): Die verborgenen familiären Beziehungen in Deutschland: Die multilokale Mehrgenerationenfamilie, in: Kohli, Martin & Marc Szydlik (Hg.) *Generationen in Familie und Gesellschaft*, Opladen: Leske + Budrich, S.97-121
- Bowling, A. N.N.; See-Tai, Sharon; Ebrahim, Shah; Gabriel, Zahava; Solanki, Priyha (2005): Attributes of age-identity. In: *Ageing and Society* 25 (4), S. 479–500.
- Budde, S. H.; Stulp, F.; Sancho-Pradel, D. L. (2008). Using persona descriptions as a communication tool in interdisciplinary system design. In: *Gerontechnology* vol. 7.2 pages 229
- CARMA – Care for the Aged at Risk of Marginalization (QLK6-CT-2002-03421) - Recommendations and Guidelines to Policy Makers. (2005).
<http://www.egga.ee/RecommendationsFinalwCoverTOC.pdf> Last accessed:2/10
- Debus, Mary, Academy for Educational Development / HEALTHCOM or the Communication and Marketing for Child Survival Project / U.S. Agency for International Development, 1988
- Dürrenberger, Gregor; Kastenholz, Hans; Behringer, Jeannette (1999): Integrated assessment focus groups: bridging the gap between science and policy? In *sci public policy* 26 (5), pp. 341–349.
- Findlay, Robyn A. (2003): Interventions to reduce social isolation amongst older people: where is the evidence? In *Ageing & Society* 23, pp. 647–658. Available online at <http://journals.cambridge.org/action/displayFulltext?type=1&fid=175238&jid=ASO&volumeId=23&issueId=05&aid=175237>.
- Fritz, Jürgen (1992): *Spielzeugwelten. Eine Einführung in die Pädagogik der Spielmittel*. 2. korr. Auflage. Weinheim: Juventa Verlag.
- Grajczyk, Andreas; Klingler, Walter; Schmitt., Sibylle (2001): Mediennutzung, Freizeit- und Themeninteressen der ab 50-Jährigen. Ergebnisse der SWR-Studie '50+' und weiterer Studien In: *media perspektiven* 4/2001, S. 198-201. Available online at http://www.media-perspektiven.de/uploads/tx_mppublications/04-2001_Grajczyk.pdf
- Hawkley LC, Thisted RA, Cacioppo JT: Loneliness predicts reduced physical activity: Cross-sectional & longitudinal analyses. *Health Psychol*. 2009 May; 28(3):354-63

Hemme, Lothar (2010): Senioren und Gesellschaftsspiele - Versuch einer Standortbestimmung. In Guido Hunke (Ed.): Best Practice Modelle im 55plus Marketing. Bewährte Konzepte für den Dialog mit Senioren. 1st ed. Wiesbaden: Gabler, pp. 91–105.

Jakobs, Eva-Maria (2008): Alter und Technik. Studie zu Technikkonzepten, Techniknutzung und Technikbewertung älterer Menschen. Aachen: Apprimus.

Leeuw, Edith de (2008): Self-Administered Questionnaires and Standardized Interviews. In Pertti Alasuutari, Leonard Bickman, Julia Brannen (Eds.): The Sage handbook of social research methods. Los Angeles: Sage Publications, pp. 313–327.

Mayring, Philipp (2007): Qualitative Inhaltsanalyse. In Uwe Flick, Ernst von Kardorff, Ines Steinke (Eds.): Qualitative Forschung. Ein Handbuch. Orig.-Ausg., 5. Reinbek bei Hamburg: Rowohlt-Taschenbuch-Verl., pp. 468–475.

OE24.at. Deutsche Studie - Sechs von zehn Senioren spielen am Computer. <http://www.oe24.at/zeitung/digital/article318942.ece>. Last accessed: 2/10

Office of National Statistics: Older people,. Living arrangements. At: <http://www.statistics.gov.uk/cci/nugget.asp?id=1264>

Resnick, Barbara (2001): Prescribing and exercise program and motivating older adults to comply, Educational Gerontology, 27:3-4, 209-226, DOI: 10.1080/036012701750194950

Schelling, Hans Rudolf; Seifert, Alexander (2010): Internet-Nutzung im Alter. Zürich: Univ. Zentrum für Gerontologie (Zürcher Schriften zur Gerontologie, 7). Available online at http://www.mediadesk.uzh.ch/articles/2010/senioren-und-internet--mit-passender-unterstuetzung--geht-ein-drittel-der-offliner-online/BerichtIKT_def.pdf.

Smithson, Janet (2008): Focus Groups. In Pertti Alasuutari, Leonard Bickman, Julia Brannen (Eds.): The Sage handbook of social research methods. Los Angeles: Sage Publications, pp. 357–370.

Sorkin D, Rook KS, Lu JL: Loneliness, lack of emotional support, lack of companionship, and the likelihood of having a heart condition in an elderly sample. Ann Behav Med. 2002 Fall; 24(4):290-8

Statement of ethical practice for the British sociological association (2002): <http://www.britisoc.co.uk/NR/rdonlyres/801B9A62-5CD3-4BC2-93E1-FF470FF10256/0/StatementofEthicalPractice.pdf>

Statistisches Bundesamt (2011): Ältere Menschen in Deutschland und der EU. Wiesbaden: Statistisches Bundesamt. Available online at <http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Content/Publikationen/Fachveroeffentlichungen/Bevoelkerung/Bevoelkerungsstand/BlickpunktAeltereMenschen1021221119004,property=file.pdf>.

Zafar, Aylin (2011): Physical Video Games May Help the Elderly Psychologically at <http://www.theatlantic.com/technology/archive/2011/02/physical-video-games-may-help-the-elderly-psychologically/71184>

Tomaka J, Thompson S, Palacios R: The relation of social isolation, loneliness, and social support to disease outcomes among the elderly. *J Aging Health*.2006 Jun; 18(3):359-84

van Dijk, Jan (2006): *The network society. Social aspects of new media*. 2nd. Thousand Oaks, CA: Sage Publications.