



Join-In

Senior Citizens Overcoming Barriers by Joining Fun Activities

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1 About Join-In

Join-In has been developing a social networking platform and a concept for elderly people to participate in social activities and to escape social isolation. This will enable and facilitate communication by providing the necessary technologies and by offering activities that encourage socializing. Join-In offers a variety of activities to motivate, but also to stimulate the elderly. The Join-In Social Portal, the "Memofix" game, the multiplayer biking exergame and exercises facilitate communication with others. At the same time do these activities help the senior users to stay active, to improve their health status and they contribute to the target group's quality of life. Join-In supports people maintaining and setting up contacts to family and friends but also to others sharing similar interests and/or being in a comparable life situation.

Most social networks, computer games and exergames on the market are not suitable for the elderly. Elderly have special needs. Many elderly persons have physical barriers to overcome (e.g. arthritis in their hands), many do not use computers on a regular basis and are unwilling or unable to invest time in configuring their profiles in a social network; often they cannot adjust to the speed of commercial games- yet would like to compete with their grandchildren. The commercial exergames are typically addressed at young people.

The activities offered by Join-In are accessible via PC, or via TV and a set-top box and some also by tablet. An extensible social and gaming platform, a social networking portal, a memory training and socializing game, a biking exergame and exercises are taking care of the special needs of the elderly and aim to arrest the decline of cognitive abilities. The cognitive game is browser-based and thus portable to different devices and operating systems. It supports the use of external gaming peripherals (like Microsoft Kinect or Hillcrest Scoop). As many of the targeted users found the controllers difficult to handle and given that none of the controllers tested was found suitable for the elderly, new controllers were modelled and prototyped.

Active participation is vital for the individual to profit from the Join-In developments, yet motivation in the elderly is a challenge. One of the issues is the heterogeneity of the elderly. Join-In developed a methodology for elderly persons to participate in social activities.

The users were involved in the project development at all stages. Regular meetings took place with around 80 (total) users in Germany, Hungary, Norway and Ireland. Most of the participants were 70-90 years old. The work with the users has been very intensive. The attitude towards gaming and computers was found to differ between the countries. The users in Ireland and in Norway were found to be less

apprehensive of computers and new technologies compared to those in Hungary and especially in Germany. Gaining the trust of the users was identified as a significant issue. The involvement of focus groups and spokespersons was found to be beneficial.



Fig. 1 Join-In Social Network

The new technologies and products developed in the project for the elderly will open new markets. Our trials showed that the target group finds the social network and activities offered very motivating and beneficial for their physical and mental health and fun to use. A variety of approaches is being used to assess the marketing of the future products. Approaching regional groups for the provision of new types of services appears to have potential. Simultaneously we have been contacting technology and telecommunication providers to see whether Join-In can be integrated into their products. In addition to this the business partners of the project intend to market the projects themselves. The Hungarian partners have started building an integrative care system; the Join-In prototypes are an integral part.

For more information please go to the Join-In project web-page:

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

2 Introduction to the Report

The United Nations (UN) estimate that by 2050 one out of every five people will be over 60 years, and by 2150, one third of the people in the world are expected to be 60 years of age or older (1), (2). In Europe in the near future, it is estimated that the EU-25 countries will experience a demographic shift from 2000 when 15.7% of the population was over 64, to an estimated older population of 17.6% in 2010 and 20.7% in 2020 (3).

Also the number of the “very old”, 85+ will rise continuously. Thus it is expected that, in the EU the number of 85+ will triple from 23.7m to 62.4m by 2060 (4). This will have a major impact on public expenditure. The 2012 Aging Report (5) forecasts a rise of 4.1% of GDP of high-age related costs. Also the European labour market will be affected. It means that more dependants have to rely on fewer active nursing staff and dependants. The demand of nursery homes will be growing. In Germany the demand is supposed to more than double - from presently 845.000 places to around 1.95m (6). Besides economic reasons it is a matter of dignity and humaneness to help them ensure their quality of life for as long as possible.

The British Campaign to End Loneliness, an initiative that aims to create conditions to reduce loneliness, i.e. the perception of being alone and isolated (7), in later life, states that “half of all older people, about 5 million, say the television is their main company”. Research that has been carried out over the last few decades has shown that “10% of older people always feel lonely or feel very lonely” (8).

Loneliness and social isolation have a major impact on health. Cacioppo found that loneliness makes blood pressure rise, that it accelerates ages, destroys the immune system and dulls cognition (9). Steptoe (10) states that loneliness and social isolation are linked to increased mortality. At the same time loneliness and social isolation are associated with old age. Reduced resources, death of contemporaries and reduced mobility are just some of the factors increasing the risk for losing social contacts and a reduced social network.

Social Networking is a means of using the internet to make connections with individuals who share the same interests. It has become very popular in the past years for connecting privately (e.g. Facebook) and on a business basis (e.g. LinkedIn). For a long time social networks have been a domain of young people. However, more and more they are opening up for the elder generation, too. The very elderly people are so far rarely addressed. The elderly users find the use of on-the-market social networks sometimes difficult. The 70+ generation did not grow up with computers. They do not know how to use a computer nor do they “think digitally”. “Making friends on the internet” has no meaning to many of them. Therefore, attracting highly aged people to social networking site (SNS) is a challenge and requires a thorough approach.

In Join-In we developed a social network specifically aimed at non-computerized persons aged 75 and older to facilitate and enable social contacts, even when moving and going outdoors gets difficult. The activities connected to the social platform encourage exercising and brain training. Join-In worked very closely with the users in four European countries (Germany, Hungary, Ireland and Norway) to assess the users' needs. For over a year we analysed the target group users wishes but also their fears. Based on the user analysis we developed a closed Social Networking Portal (e-mail, instant messaging, videoconferencing, profile, groups, photo albums) and linked to it a communicative and brain training memory game ("Memofix") with many different card decks, a set of chair gymnastics videos, a cycling exergame to be used in combination with a stationary bike and a tablet. All developments were specifically built to meet the requirements of that age-group; to make it easy for seniors to socialise with others -and to encourage communication. The Join-In Social Network and the developed applications¹ were pilot tested by the users in Germany, Hungary, Ireland and Norway. The users received the Join-In Social Network and its applications well; they found them meaningful, useful and enjoyable. Details on the developments and outcomes can be found in the project deliverables at the Join-In website and in the Join-In Blog.

In this report we analyse what social networking means especially in relation to the elderly citizens, how to attract senior users to social networking and how elderly can profit from a social network. We will start by an analysis on social networking, explain the approach, look at the requirements and at motivation. We will concentrate on the social network and not consider the Join-In applications in detail, In parallel to the literature studies we show the outcomes of Join-In to finally draw some conclusions.

¹ The integrated solution with all the applications connected to the social network is called "Join-In Interactive Portal for Senior Citizens"

3 Social Networking

3.1 Social Networking - Introduction

Investopedia describes social networking as: “The use of internet-based social media programs to make connections with friends, family, classmates, customers and clients. Social networking can be done for social purposes, business purposes or both. The programs show the associations between individuals and facilitate the acquisition of new contacts” (11). A social network thus mainly serves to build communities, to network, to communicate and to exchange with others, i.e. to socialise. Recently social networking sites have started to increase their popularity by linking to or incorporating entertainment like games, films or music. Besides there are networking sites which are not concentrating on the user profiles but solely on creating interest groups, such as Meetup.com or Livejournal.com. In this report we will disregard those.

The attractiveness of a social network depends on its functions, on its usefulness to the audience, on the variety of information, on its users and –to a certain degree- on the number of users. Social Networking sites usually create attention through digital media; but how to attract a target group that does not use digital media?

Social networking is the primary online activity and accounts for 1 in every 5 online minutes. (12). In 2009 Jiyoun Cha (13) analysed what affected the use of social networking sites by looking at the frequency of use and at the amount of time spent at the site by questioning a group of college students. He found that

- internet experienced persons use social networking websites more frequently and that they spend more time on them;
- motivation for use were entertainment, relief of boredom, interpersonal utility, escape, convenience;
- the frequency of use was reduced by privacy concerns but did not affect the time of use on the site;
- women spent more time on social networking sites than men, no difference was shown by the frequency of use;
- the most important determinant for both frequency and amount of social networking site use was social interaction;
- ease of use correlates with the frequently of use, but not with the time spent on the network;
- internet experienced persons spend more time on social networks than people with lesser experience.

He also detected that escaping worries was a major reason for spending time on social networking sites. He points out that other authors (14) found the same correlation for the use of the internet. Valerie Barker (15) analysed the motives of older adolescents for using SNSs and found that persons with a high collective self-esteem use social networking to communicate with their peers, while persons with a low collective self-esteem use social networking for social compensation.

Adult users state that their primarily reason for using social networking is staying in touch with current friends and family members (75%), getting in touch” with old friends they’ve lost touch with” (50%) sharing a hobby or interest (14%) and connecting to others (9%). Other reasons were reading about celebrities and finding (5 %) and looking for a partner (3%) (16).

3.2 Social Networking in Older Adults

Though more elderly persons are now using social networking sites than did a few years ago, the uptake is still low (Fig. 2 (17)). Even in the UK, which has the 2nd highest number of internet users in Europe after the Netherlands, only 25% of online adults over 65 olds have registered with a social networking site compared to 92% of 16-24 year olds.

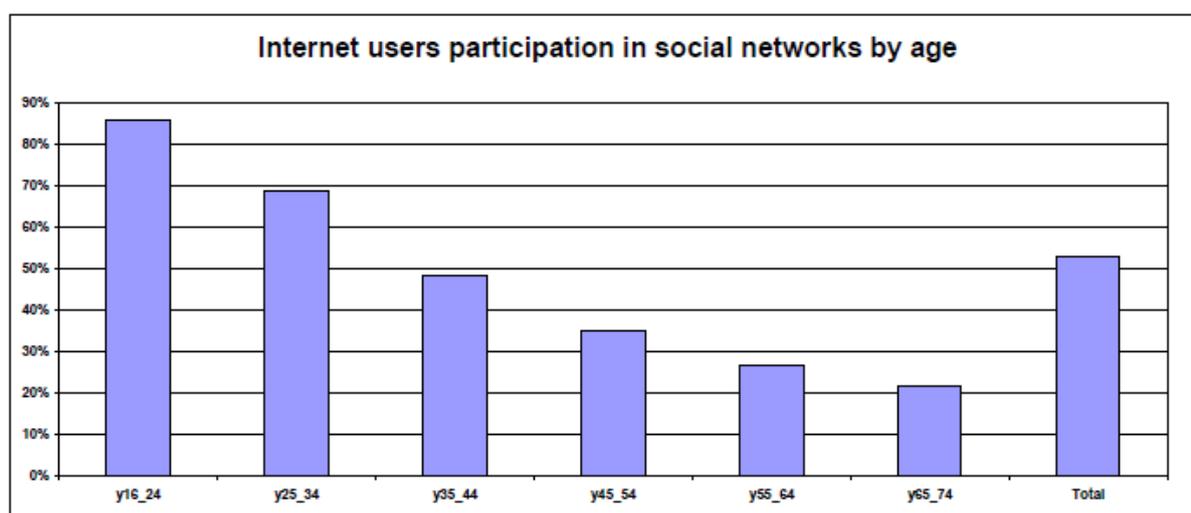


Fig. 2 Internet users’ participation in social networks by age. Source: (18)

Lehtinen and his team (19) tried to find the reasons for the reluctance towards social networks by looking at the age group 55-65. The study gave the following results

- “Older adults perceive the internet generally as an unwelcoming place for sociality, and SNSs as places for people who seek publicity and superficial relationships – qualities we found inconsistent with values expressed in older

adult life” and that these (e.g. self-disclosure) did not meet with their values in friendships, and shared activities

- Privacy, e.g. intrusion by hackers or by unintentionally disclosing something private by lack of knowledge, was another issue that was argued against the use of a social network.
- A further outcome of the study was that “intentional self-presentation is not socially acceptable among older adults” and uploading a photo of oneself was considered self-conceited.
- The participants of the study were little interested in new acquaintances and were unsure about trusting a person (on the net), who they do not know

There are many arguments how seniors can profit from social networking. Making the older generation participate in the internet and in social networking is more than simply adding a new activity to the elderly people’s lives, it means inclusion and participation. Therefore, it is important to find ways to make social networking attractive to this user group.

Nef et al (20) did a systematic review on Social networking sites and older users and found that there are too few studies on the use of social networking sites by older adults to allow a conclusion on usage and effects.

4 Approach

Social networking has become part of the daily routine for many young people and even children. They use it for organising their social activities and time and they “grow into it” -sort of automatically- just like generations before “grew into” the use the telephone. Contrary to this social networking does not come naturally to many elderly adults. Elderly individuals have to get attracted to a network and if a social networking site (SNS) has not been established some advertising and marketing will be needed to create interest in the target group. The target group needs have to be analysed in detail to understand why people join groups, what they expect from a social network and to assess what distinguishes this target group from others.

In Join-In user analysis constituted a vital part of the project. User groups were established in Germany, Hungary, Ireland and Norway. Two main user organisations were involved in the project and had a very close contact to the users throughout the project. The users were recruited from senior clubs, patient organisations, church associations, and from voluntary neighbourhood support groups. Special sessions, e.g. board/card playing sessions, Wii and XBox sessions with the users helped to gain the trust of the users. Key persons, such as social workers, ambulatory and stationary care nurses, but also priests got involved in the project. Scenarios, personas, but also quantitative methods (serial focus groups, guided and structured interviews, observations,) supported by qualitative measures (standardised questionnaires) served to identify the target group users, their needs, requirements but also barriers. The data was analysed. Based on the results the social networking portal and the applications were developed.

Vital prerequisites on the use of an SNS are

- enabling access to the technologies
- meeting the requirements of the users
- ensuring usability of the SNS
- motivating the elderly user

The Join-In Social Networking portal supports communication, socialising, exercising and memory training -main requirements by the users. The technologies are built to consider cognitive limitations of the elderly user. Usability and accessibility were major aspects during development. Motivational aspects, especially as concern senior adults were analysed and considered in the applications. The users were trained and user support was provided at all times. Join-In was piloted in the four partner countries by around 130 users. The users found the applications entertaining, useful and socialising. Details will be presented in the relevant chapters.



Fig 3 Three stages of social networking

Another challenge is to maintain the interest of the users by ensuring the attractiveness of the SNS, for example, by appealing content and activities, by reasonably sized community and by keeping the elderly users motivated.

A concept for Social Networking of Elderly Persons has to consider all of these stages. We will concentrate on the first two issues as we consider the third issue a major marketing activity. Promotion and marketing are important at all stages. For Join-In we describe this in the project deliverables D7.1 Exploitation Plan and in the Blog “Findings in marketing for the elderly population”.

5 Requirements on Social Networking of Elderly Citizens

5.1 Target Group

Any product developer targeting a specific user group needs to analyse this user group in detail. He/she has to assess the users' requirements but also any barriers that might stop them from using the product. As many of the elderly users, i.e. the target group we are addressing, is most likely not used to digital media it is important to also assess their attitude towards digital media and towards social networks, to assess if are any fears and barriers concerning computing and/or the use of the social networks. Elderly persons often lack confidence (21); this needs to be addressed accordingly.

5.1.1 Classification

A standard classification of the elderly is missing. In statistics and marketing they are often considered as one group starting at 65, 55 or even 50 years of age. This does not reflect the heterogeneity of the group. Bailey (21) reviewed a number of studies and journals and proposed the following classification for the elderly: older: 60-74 years, old-old: 75+ years. To further distinguish between older age groups, e.g. 65-74; 75-84; 85+ (22), seems sensible as from the age of 75 years of age strength and performance of older adults often decline and many seniors start getting frail. Frailty has a major impact on health. It increases the risks of falls and may easily make people to being confined indoors (23). More information on the target group can be found in D7.2 Exploitation plan.

Homebound elderly people can mostly be found amongst the old elderly. This report aims at homebound elderly individuals and thus we will focus on elderly from the age of 75.

Join-In aimed at homebound elderly individuals and concentrated on persons older than 75 years of age.

We found the target group users rather sensitive and hesitant. Time was needed to build trust. In the user requirement analysis it proved beneficial to address key persons and persons below the targeted age group.

In the pilot study we learned that it is advantageous to address the elderly persons prospectively i.e. when they are still active. At that stage we found seniors still had enough confidence to get acquainted with computers, the concept of social networking and Join-In.

Homebound persons could only be reached via care nurses.

5.1.2 Quality-of-Life in the Elderly

The use of a social network aims to improve the Quality of Live (QoL) in the elderly. In order to do so, it is important to know what QoL means to the target group and which factors contribute to it.

Ageing research distinguishes between objective and subjective quality of life. Objective quality of life is determined by “the extent to which a person has access to and command over relevant resources (income, health, social networks, and competencies)” (24). It is measurable. Subjective quality of life is a person’s individual perception (life satisfaction, emotional well-being). A person will compare his/her (objective) living situation according to their own values and standards. Thus individuals will judge the same objective situation very differently. (24)

QoL is determined by psychological, social and physiological functioning. Age, poor pension adequacy, living in a deprived area, poor health, bad experiences, and a recent life event result in a lower quality of life (25). Loneliness is often related to quality of life and is highest for the very old. A Greek study showed a major increase in loneliness with every decade from the age of 75 due to the changes experienced during that period of time rather than the process of aging (26). The same study showed that the loss of a partner had the greatest impact on the quality of life.

Studies indicate that the mental and emotional state of a person, i.e. his/her subjective wellbeing, plays the largest part in determining a person’s feeling of well-being (27). Even so no single factor could be found that determines QoL, three highly important domains of quality of life are: **health**, **social integration**, and **participation**. These interact (28). As Motel-Klingebiel et al state “on the one hand good health is the precondition for social integration and active participation in late life. On the other hand, it is well known that social integration and active participation positively influence the health status of older people.”

5.1.3 Social Integration

De Jong Gierveld (29) describes social isolation as follows: “Social isolation concerns the objective characteristics of a situation and refers to the absence of relationships with other people”.

A socially isolated person does not have to be lonely per se and a lonely person is not socially isolated per se, yet loneliness in old age is often an indicator of poor social inclusion. As mentioned above loneliness, i.e. the perception of feeling alone and isolated and social isolation have a major impact on health. Thus the “Campaign to end loneliness” (30) states that loneliness is amongst others related to the onset of Alzheimer disease, to depression and that “loneliness makes it harder to regulate behaviour, rendering people more likely to drink excessively, have unhealthier diets or take less exercise.” In a study by Golden et al. (31) loneliness and non-integrated social support networks accounted for 70% of depression in the elderly (Fig. 4).

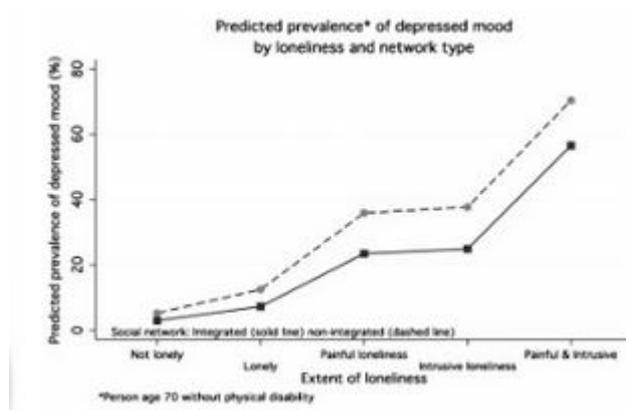


Fig. 4 The predicted prevalence of depressed mood by loneliness and network type. Source: (31)

Sörensen and Pinquart (32) point out that loneliness is more dependent on the quality than the quantity of the social contacts of a person. Tesch-Römer (24) states that social integration is determined in earlier phases of life and that people with less education tend to be less integrated. He also states that over the last decade an extended social network has become more important.

Nicholson (33) identified the following five attributes as indicative of social isolation: number of contacts, feeling of belonging, fulfilling relationships, engagement with others and quality of network members. He also named the following attributes to antecede social isolation: lack of relationships, psychological barriers, physical barriers, low financial and resource exchange, and prohibitive environment.

The Australasian Centre of Aging (34) cites three findings that indicate that social isolation might become an acute problem in old age:

- social exclusion in mid-life;
- key life events or transitions in later life
- age discrimination inherent in social attitudes and institutional arrangements.

They also looked into computer programmes which aim to help elderly individuals to overcome loneliness and found that programs that encourage communication e.g. email, have a positive effect, while programs encouraging processes e.g. web searching, may increase social isolation and decrease socialising. They also point out that when evaluating IT use by elderly people any evaluation has to allow enough time for the older persons to get acquainted to the technology. A literature survey on IT related approaches overcoming social isolation in older people (35) found that teleconferencing as a strategy for bringing people together seemed to be effective although time intensive. In all cases the personal contact was considered vital.

5.1.4 Participation

Social participation is an important component of quality of life. Participating gives a feeling of belonging, it can provide access to activities, information and emotional support. Participation is strongly correlated to education, income and living conditions. Social participation seems to be lowest for a person with low individual resources living in an economically deprived region (36).

Social participation often decreases with age . due to a reduction of income and a loss of peers or family members. Physical limitations make participating in social activities difficult. Voluntary work, a means of social participation for older individuals is strongly influenced by education. (24), (36).

Especially very old persons find it difficult to participate; this can easily lead to a feeling of not being valued which may result in loneliness (37). Technology might increase this feeling as they make them aware of the speed of the developments and the changes of the world around them. Not being able to cope with the technology leaves the older people feeling “outdated and frail” (37). This feeling could not be counteracted by socialising with younger people.

Digital media might offer new possibilities to participation for the very old people, yet it must not increase the feeling of exclusion.

5.1.5 Health

A strong correlation between the socio-economic factor and health has been demonstrated (38) and the health status has a major impact on a person’s quality of life. Poor health can be a predictor of social isolation. According to (39) it is even the most prominent one. Contrariwise it is also true that a supporting social network is associated with good health (40). The prevalence of physical and mental diseases is much higher in homebound elderly persons than in the average older population (41). People developing health problems easily lose the confidence to make new friends or to undertake new social activities. This makes them less open for joining social networks, and requires extra motivation and training.

Even though healthy life expectancy has increased over the last decades, health is a major concern for many older persons. Brennan, Horowitz and Ya-ping (42) report that twenty per cent of America’s older adults (70+) reported dual sensory impairment and the high levels of dual impairment were shown to increase the risk of difficulty with the ‘instrumental activities of daily living’ (including using a telephone, and hence a computer).

Impediments and health related issues also have to be considered in relation to computing and online social networking. Developers have to think how to make an SNS attractive for an elderly person without it being stigmatising. Special needs have to be taken care of when designing a social network (and its content), when addressing the target group and when training the elderly on the use of an SNS. A

majority of highly aged people experience age-related functional limitations when getting older. These need to be taken into account. Even though not every old person is affected and even though elderly people usually cope very well with their limitations, acceptance of the future product depends to a great deal on its usability.

Typical age-related functional limitations are listed in 5.3.4. It is important to analyse how far these need to be considered when addressing the target group users and when building/introducing a social network in order to create acceptance.

In Join-In Quality-of-Life was assessed indicatively. The involved users can be classified as being rather active. Even though many of the users have health problems (pain and mobility problems), only few persons felt slightly/severely depressed from time to time.

We found that social inclusion had a major impact on the Quality-of-Life. Some persons involved in the pilot study who actively participated in social activities, still felt socially excluded and sometimes depressed. They were the persons that gave the highest ratings to the Join-In Interactive Portal.

We found an indication that moving houses at a later stage of life is a risk for social exclusion (Germany).

The elderly care workers stated that loneliness and social isolation were main issues for the homebound individuals even if they had a partner.

5.1.6 Requirements on the Social Network

Content

Social networking is about exchanging common interests and maybe about doing certain activities, e.g. playing games. In any social network the quality of the content, and the relevance of the content to the target group have a major impact on the success of the SNS. The target group users appreciate content that is meaningful, useful and already part of their daily lives. Brain training activities will be very much appreciated. In a major German survey with 2000 participants (43) 41 % of the people stated that they did crosswords, Sudoku, etc. daily. Socialising activities also ranked high, the main priorities of the 80 year old persons were family, nature, contact to others and indulgence came forth.

To many people local events are more meaningful than happenings in other countries. A connection to former life activities will help establishing an SNS with the older generations. The interests will vary between regions.

The Join-In we built a social network based on the users' interests and needs which were the outcomes of a thorough user requirement analysis. The users decided on memory training game, an exergame which was related to a favourite sport of now or the past, and a portal which supported communication and socialising. The groups in the SNS are based on the users' wishes.

The following was named by the users as their favourite past time activities:

- In Germany: voluntary work, meeting with friends and family, travelling, playing games, cultural activities an sports (dancing, swimming)
- In Ireland: walking swimming, gardening
- In Norway: Handicraft of different kinds (knitting, porcelain painting, carpentry, etc.), cultural activities, cooking, walking, 3 persons answered "surfing on the internet".

The target group's barriers

Even though computer knowledge, the internet and also social networking offers much to the elderly generation, many elderly are reluctant to use digital media. As fear has a vital influence on the acceptance of computer technology (44), (45) and also on computer literacy (46), (47), it is important to know the reasons behind the fear order to being able to address these accordingly.

Studies (48), (49), (50), (51) show the following reasons

- lack of competence and skills;
- elderly not see any advantage in computer use;
- mistrust in the authenticity of internet information;
- lack of time;
- lack of resources.

Security is another major concern of many elderly users (52) (53).

Though IT/ internet uptake and the socio-economic status correlate (54) (55), Choi's (54) could, show that a frequent use increases the internet skill regardless of the

socio-economic status.

In the following chapters we will look into this in more detail.

In the Join-In user analysis elderly stated the following barriers

- Missing skills
- Fear of breaking something and of misusing the technology
- Seeing no benefits in the using of the technologies
- Lacking confidence
- Concerns on privacy, data protection and data security (Germany, Ireland)
- Fear that the technology will be controlling their lifestyles and that they would have to build their daily activities around the technology (Germany).

5.2 Abilities and attitudes towards technologies and computers/ITC

The development of ITC over the life-span of an older elderly person has been amazing and the influence it would have was not always foreseeable. A short outline of a computer history is presented along the life of a person who was 75 in 2013 in App. A.

5.2.1 Internet Use

The use of computers and the internet by the elderly have increased over the past years; yet, many of the older individuals are still missing out. (56) shows the use of the internet by age group (see Fig. 5) in 2013. Even though persons older than 74 years of age are not considered, it shows that a major drop in the use of the internet from 55 years of age. A survey done in Germany in 2013 showed that 16m Germans are not using the internet, most of them elderly (58) and specifically women from the age of 50 (half the women from that age group) (see Graph 1). Once the so called “silver surfer” get used to using the internet, however, they get very fond of it. 95% of the regular users stated that they used the internet regularly for getting information and stated that the use of the internet had added to their quality of life (59).

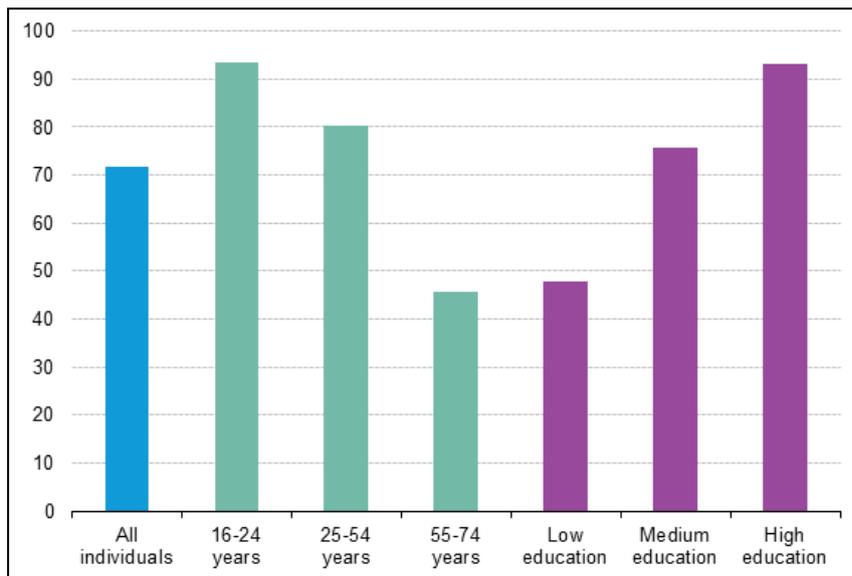
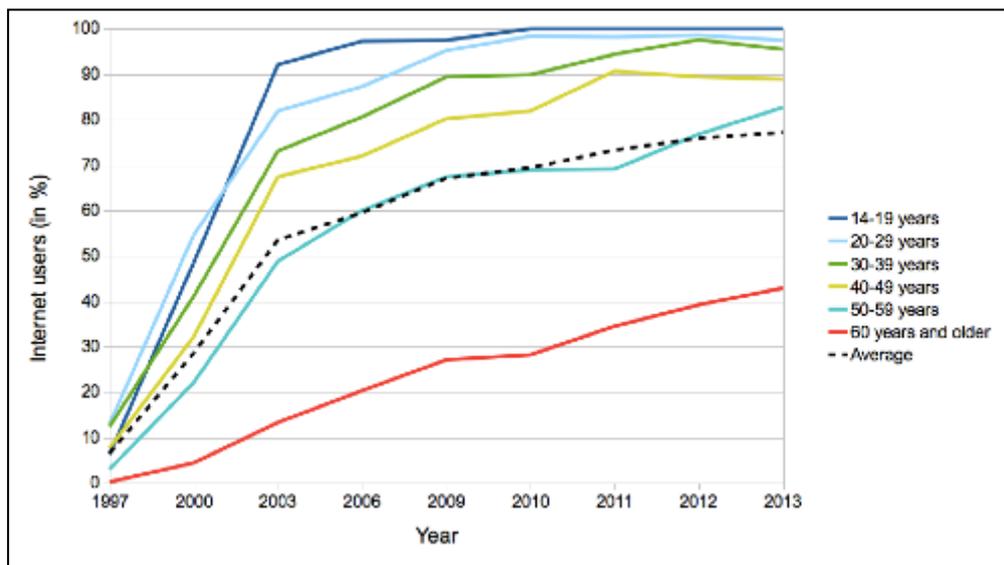


Fig.5: Individuals who used the internet on average at least once a week, by age group and level of formal education. Source: (56)

Graph 1 Use of the internet in Germany 1997-2013. Source: (60)



All statistics emphasize the influence of the education level on the use of the internet (see also Fig. 5, 6)

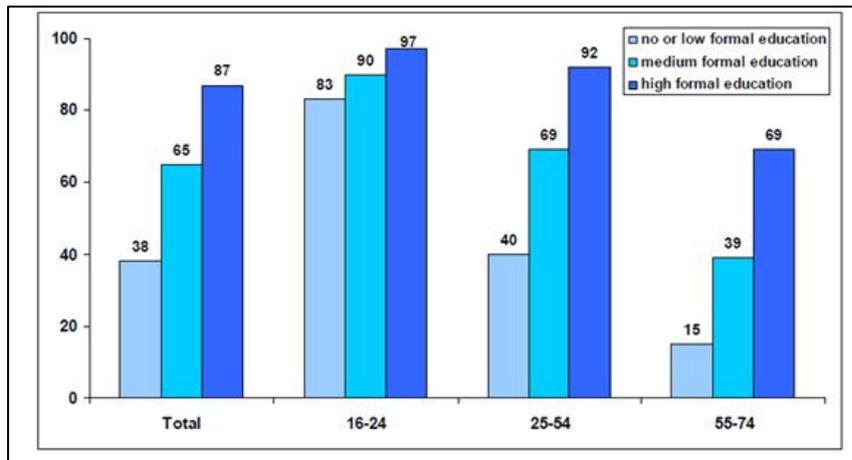


Fig. 6 Individuals who used the internet on average at least once a week, by age group and level of education, EU-27, 2009 (%); Source: (57)

When analysing what could prompt the use of computers in the elderly, (61), (62), (49), (63) found that email and communication were important factors for the elderly to going online. Kantner & Rosenbaum (64) named children as a reason for seniors that prompted them into learning how to use a computer. Fig. 7 shows the use of the internet for communication by age groups. While emailing is commonly used by people aged 55 to 74, the uptake on social networking is low.

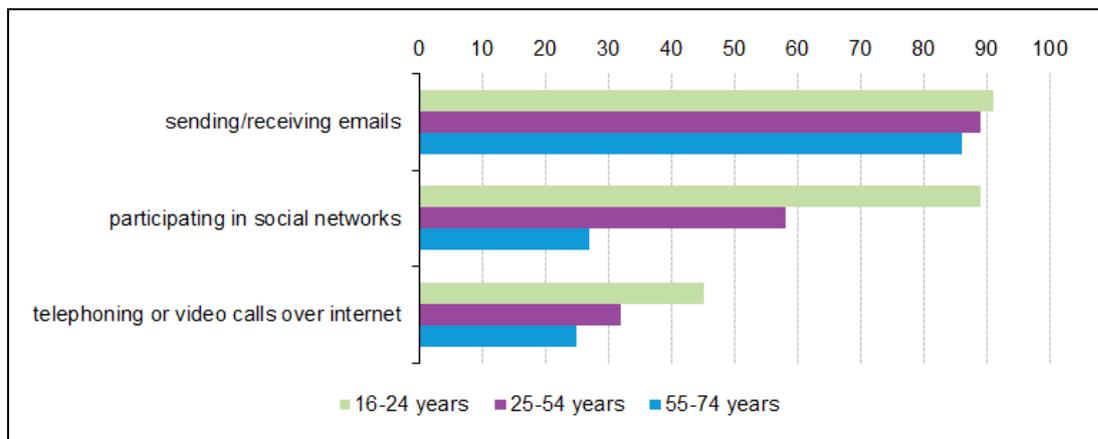


Fig. 7 Use of internet for communication, by age group, EU-28, 2013 (% of internet users) (65)



In Join-In computer literacy and internet access differed amongst the various participating countries. Due to the pilot requirements all users in Ireland and Norway were fairly experienced users. Internet access and IT knowledge was lowest amongst the German user group.

In Hungary most of the internet users were also members of a SNS.

In Germany we found that some internet user's knowledge was limited to one specific application.

Favourites with the Join-users were email and looking for information on the internet. Some used skype.

5.2.2 Barriers to internet use

In 2012 24 % the households of the European Union lacked internet access. This does not explain the reluctance of potential users. When asked the reasons given by the citizens of the European Union (17) for not using the internet resemble those that elderly people stated for not using SNS (see 5.1.6): motivation (47 %); lack of skills (35 %) and costs (6 %). In the US, where 15% do not access, the internet a more differentiated analysis (66) showed much the same result.

5.2.3 Reluctance of internet adoption by the elderly

e-inclusion is a major topic on the agenda of the European Union and "enhancing digital literacy, skills and inclusion" has been a major issue since it was first adopted in 2006 (17). Yet many of the elder generation are still left out and some authors have indicated that elderly persons are more reluctant to using new technologies (67), (68).

There have been a number of attempts to find the reasons for this. According to (69) "perceived usefulness positively affects Behavioral Intention, yet it was determined that perceived ease of use was not a significant predictor of perceived usefulness". The study group found a negative relationship between age and Internet self-efficacy. Burnett (70) found that self-efficacy is influenced by prior technology use.

Venkatesh and others (68) analysed the Behavioural Intention to accept and use a technology, and found that it depended on the expected performance, the effort, and on social influences. They further found that the use depended on the Behavioural Intention and can be enabled by facilitating behaviour. They then built another model "MATH", which determines the impact on the Behavioural Intention. This is based on three categories attitudinal (relating to utilitarian, hedonic and social outcomes (e.g. applications for personal use, for fun, status gains), normative

(e.g. influences of friends, family or TV) and control beliefs (i.e. perceived ease of use, elf-efficacy, fear of technological advances, costs)

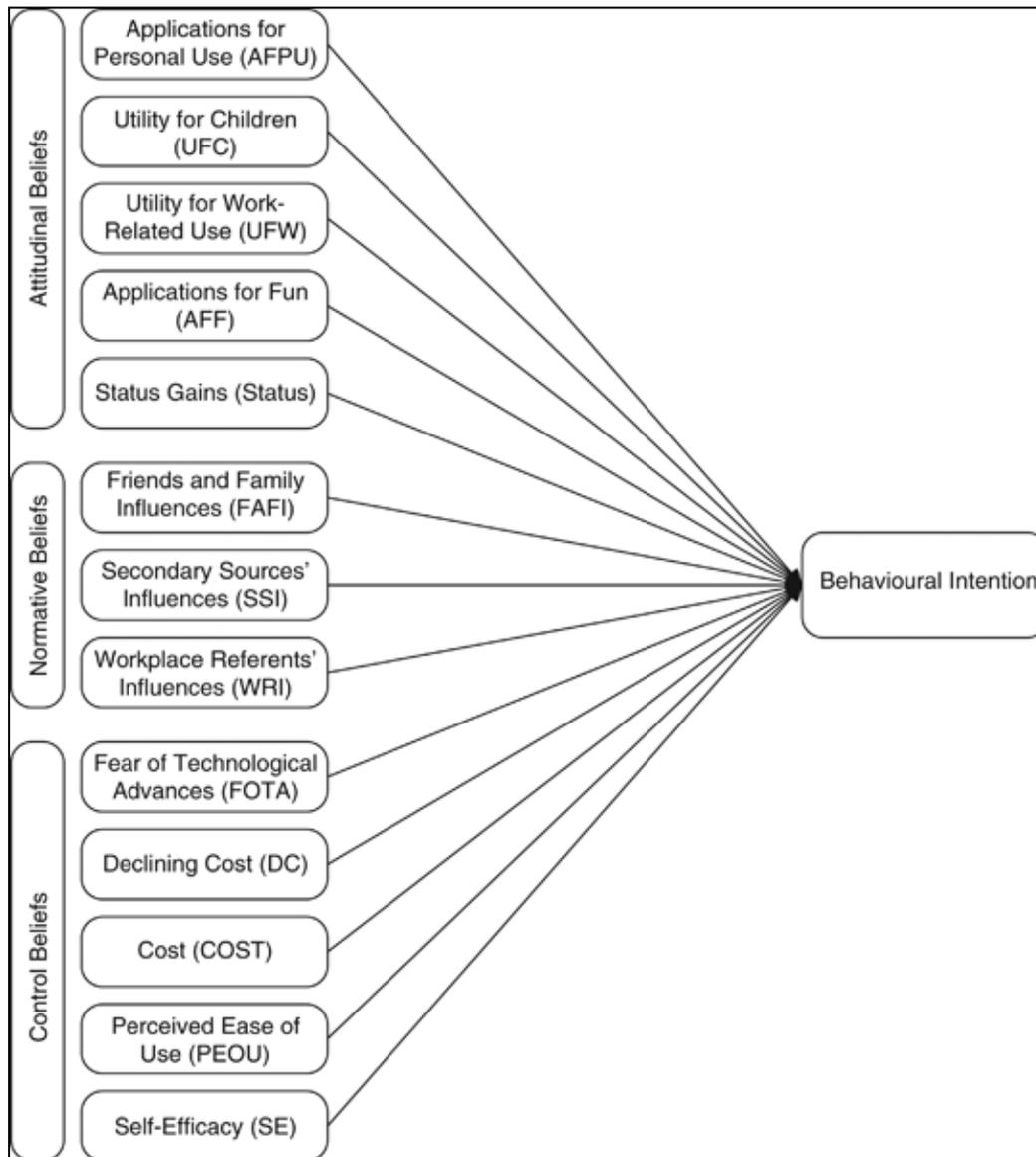


Fig. 8 Model of adoption of technology in households by Venkatesh & Brown.

Source: (71)

Niehaves and Plattfaut (71) used two different models to analyse the adoption of the internet by elderly individuals and could demonstrate that gender, age, income and education could explain the intended adoption of the internet in 70%. Analysis of 105 adults from the age of 65 using the models showed that people with a high income and a higher education are more likely to use the internet while elderly with increasing age were less likely to adapt the internet. They believe that ethnic diversity might also impact the adoption, but could not analyse this. They further argue that while their study and results were focussing on the internet; it and will apply for other IT technologies, too.

5.2.4 Computer Literacy

Computer literacy has been shown to have a positive effect on elderly people; physical and psychological well-being indices are associated with computer use (72). The attitude and ability to learn computing was found to depend, on the one hand, on experiences people had gained when first using a computer (73), (74), on the other hand, there seems to be indication that computer and internet use among older persons are related to education, active coping style, and health (77).

Many studies are dealing with digital literacy link health literacy and computer literacy. We think that health, which is the most sought information on the internet, might be used to trigger the interest of a target group where health is an important issue.

Compared to young people who like to teach themselves on the internet, seniors want to be supported by handbooks, training sessions and someone they can call in case of need (52). This also goes for Social Networks aimed at the Elderly. Elderly want to be addressed in their own language. A lot of results on internet / social networking use by elderly and the very old in Europe have been performed in the UK, or European countries, where internet use is fairly high (the Scandinavian countries and the Netherlands). In these countries English has been used for a long time. We did not find a study which looked at the use of anglicisms in IT and its effect on the elderly.

Another aspect that needs mentioning is a finding by Morris, Goodman and Brading (75) who found that age, was not the barrier, but a person's belief that older people cannot or do not use computers.

There is a growing belief that computer literacy will not be an issue for future "elderly" generations as they are using ITC at work and many of them have already made digital media part of their life. Yet till the baby boomer generation will have reached that age, there are the older generations of today who need to be looked after. Also the uptake of ITC from a certain age is still rather slow as could be shown above and it remains to be seen whether the digital agenda will be met.

5.3 Access to the technologies

5.3.1 Affordability

The costs are an issue for some people in the EU27. Around 6% cannot afford the equipment (56). In many countries the costs of the internet are not cheap and a regular asset that might be saved. The socio-economic gap widens and beating inequality is often considered the number one challenge of the 21st century. Also

elderly people will become poorer due to reduced pensions and less chances of a part-time job.

Though the costs might not be the main criteria for many of target group users, old people are careful spenders. They are concerned about the limited lifespan of a computer and in the past years they have experienced that they have to allow for unexpected spending.

5.3.2 Accessibility

Accessibility has been covered in 5.2.2 and 5.2.3. It is a major issue of the EC's Digital Agenda, but the infrastructure has not yet been fully established all over the EU. It needs to be mentioned that new programmes usually require more power as newly built systems profit best from new developers' programmes which use the latest technology. This means that PCs have to have enough memory and for most internet based applications broadband access will be required.

5.3.3 Usability

Older adults vary concerning their attitudes but also their capabilities, which are often related to experience. In a usability study done in 2013 Nielson (78) found that "users aged 65 and older were 43% slower at using websites than users aged 21-55." The 75 users came from the US, the UK, Japan and Germany. The slowness was also accounted for by the more methodological approach of the older users.

Usability has to also take care of the cognitive changes which many elderly experience. The chances of developing an age related functional limitation when getting older are high. These have to be considered during development of any IT application for the elderly users and as far as possible be counteracted in the design. The chapter starts with a short overview on age related functional limitations.

5.3.4 Age related functional limitations

Mobility

The incidence of falls increases with age. The following figure shows the answers to a survey performed in Austria in 2009 amongst 1.471 persons aged 60 years and older on the question "Do you feel your mobility is restricted due to an impediment?"

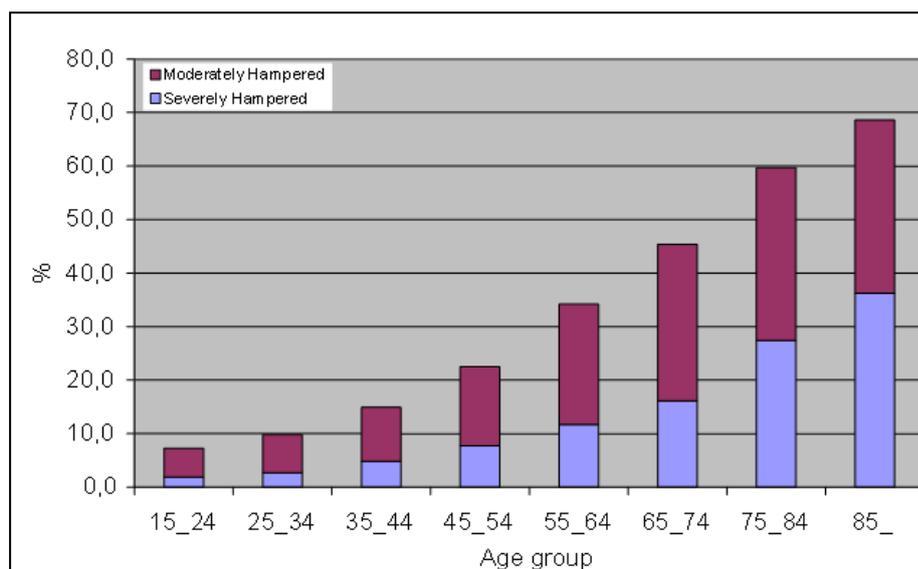


Fig. 9 Mobility restrictions of Austrian citizens (79)

The WHO Report on the main risk factors for falls amongst older people (80) states that about 30% of people over 65 fall each year, and people who are 75+ fall even more often. It says that “between 20% and 30% of those who fall suffer injuries that reduce mobility and independence and increase the risk of premature death. Many studies show that exercising decreases the risk of falls (23), (79). An SNS can offer access to exercising, e.g. by linking to a site with exercises for elderly adults.

Fall rates among institutionalized residents are much higher than among people living in their own houses. The latter is a major argument towards supporting elderly to remain living at home.

Mobility issues need to be considered when exergames and exercises are included in the social networking activities as in Join-In.

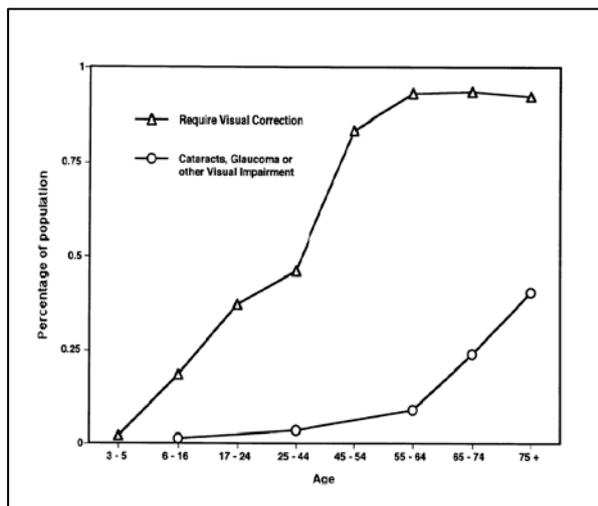
Effects on the eyes

Vision Decline (Presbyopia)

As we age the lens inside the eye hardens and loses its ability to focus; this makes it difficult to see close-up objects. Also the chances to get an eye disease which influences vision get larger with age. After the age of 40 the risk of developing glaucoma increases with each decade from around 1 percent in your 40s to up to 12 per cent in your 80s (81). The Royal National Institute for the Blind (82) estimates eyesight decline in the older population in the UK as follows

- 15.8% aged 65 to 74 years
- 18.7% for ages 75-84 years
- 45.8% for ages 85+ years

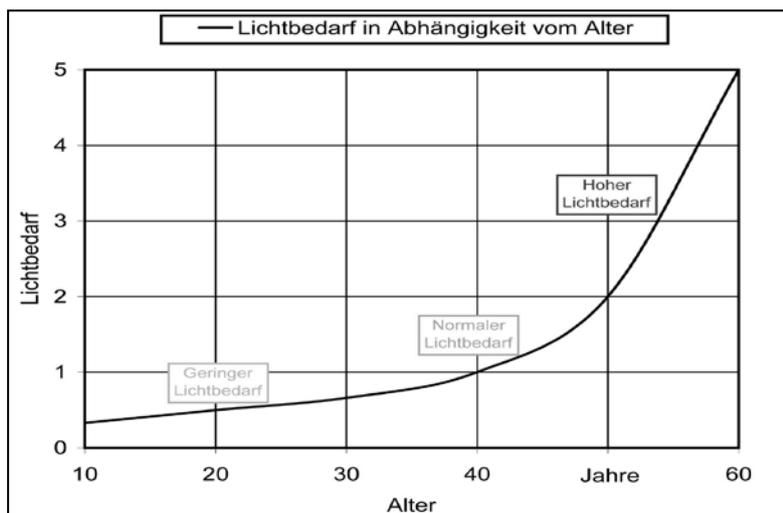
Graph. 2 Age related changes in vision Source: (21)



Demand on Light Sensitivity

With age the demand of light grows. Thus a 60-year old retina receives only 1/3 of the light as a 20-year old retina (83).

Graph. 3 Demand on Light related to age; Source (84)



Ability to discriminate colours

When getting older the colour vision often decreases. Cells in the retina that are responsible for normal colour vision decline in sensitivity. This makes colours to appear less bright and diminishes the contrast between the different colours.

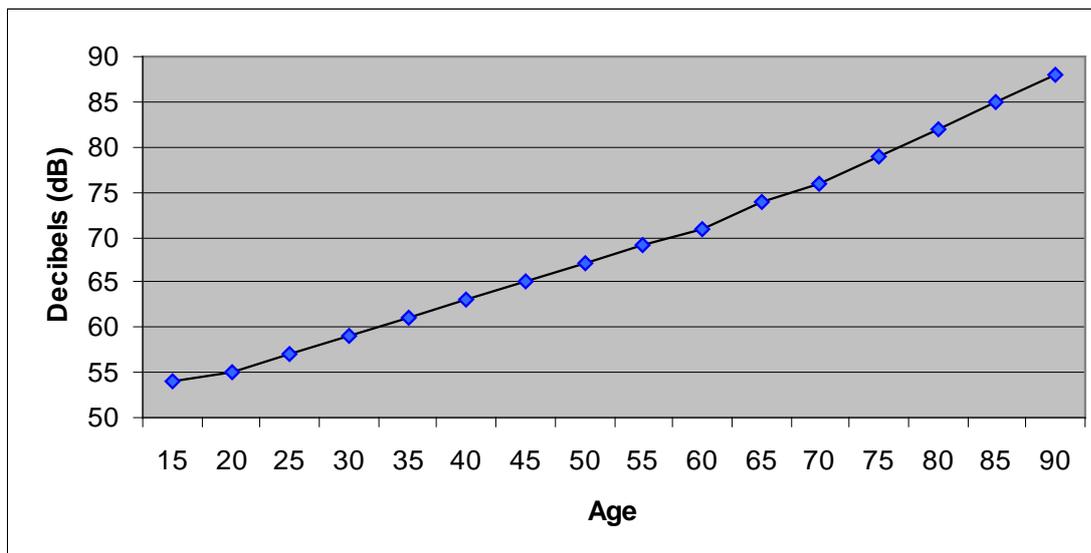
Visual field

The size of our visual field decreases by approximately one to three degrees per decade of life (81). By the age of 70 or 80 a peripheral visual field loss of 20 to 30 degrees is quite common.

Effects on hearing

Inside the ear tiny hair cells pick up sound waves and change them into signals. With age these hairs often get damaged. As they do not regrow many persons' hearing gets bad. There are also other reasons for age-related loss of hearing, such as family history. Statistically 55 % of the 65+ suffer from a hearing loss.

Graph 4 Hearing Comfort Level by Age; Source: (21)



Bad hearing has to be taken care when – as in the case of Join-In- video-chat is included.

When training seniors on the use of the network it is important that an individual might not understand because he/she simply cannot hear you and that background noise might affect a person with a hearing problem while it might not be an issue for the teacher.

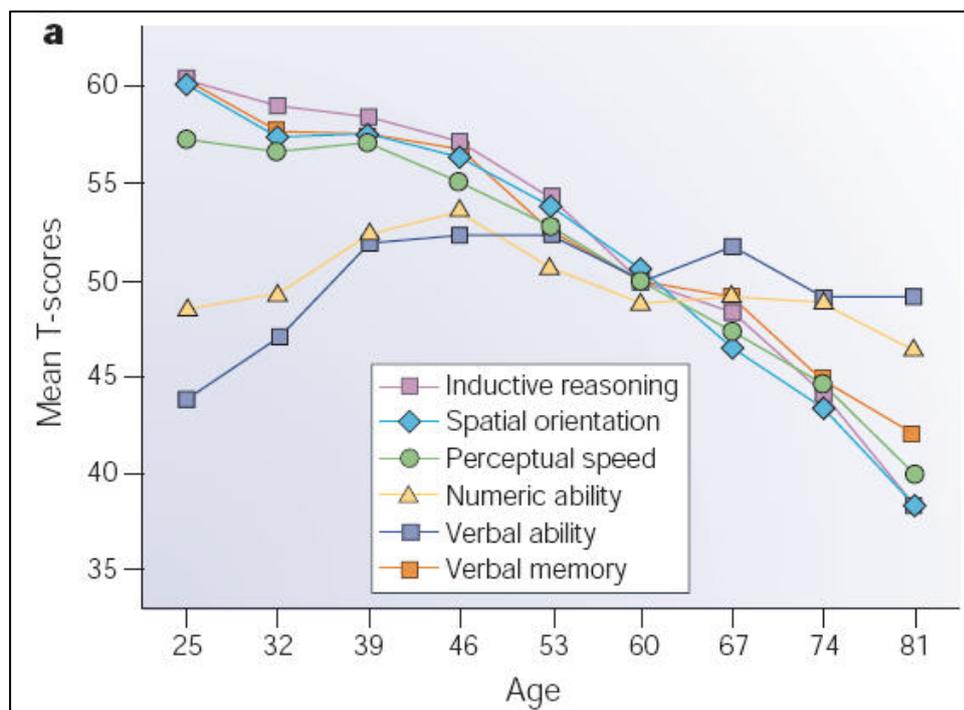
Age related cognitive effects

First of all we would like to point out that if there is a decline in some intellectual abilities, most elderly people's limitations are not bad enough to cause severe problems. While most language abilities remain with the elderly, the word-finding ability sometimes decreases. The following graph -an outcome of the Seattle Longitudinal Study (85)- shows that inductive reasoning, spatial orientation, speed at solving problems, and numeric ability often decline with age, while verbal and numeric abilities often remain stable. However, it is also true that brain reserves can be built by physical and mental exercising.

Long-term memory changes often occur with aging, the short-term memory is, however, not affected. It is also important to know that learning something new is sometimes slower than in younger ages and more repetition might be needed for

the elderly people to remember new things. Also social interaction has been shown to have a positive effect on mental capabilities.

Graph 5 Age-related cognitive effects; Source: (86)



There are some age-related disorders that interfere with normal life functions and that affect the intellectual abilities of a person such as dementia, Alzheimer's disease and later-stage Parkinson's disease. These are not considered in this report.

Contrary to some common beliefs elderly people are generally less depressed than younger adults and personality remains consistent throughout life (87). Elderly people in supervised care are more likely to suffer from depression than elderly people staying in their own homes. Age Concern New Zealand states that the "rates of depression for older people in supervised care settings are about three to six times higher than in the general senior population" (88). Other psychiatric disorders in older adults also seem to be more common in long-term care settings compared to those in community-dwelling (89). A social network -such as Join-In- could thus serve as an effective preventive measure. Further research should be performed.

Long-term memory changes often occur with aging, the short-term memory is, however, not affected. This means that learning new sometimes might take a little longer than in younger ages and that more repetition might be needed for the elderly people to remember new things. Training has to consider this, but this also has to be taken into account when adding a new feature to the site. Older adults' ability to remember is also affected by the environment. In 2009 Dr Tom Hess and

his team showed that older people' memory suffers when they are faced with negative stereotypes or when they are being stigmatized (90). This means that older people have to be reinforced on their memory abilities, but also that ageism is costly. Studies show that exercising and brain-jogging (91) -both activities offered by Join-In - affect the mental abilities positively (84), as does social interaction (91).

5.3.5 Web Design aspects

The design of any SNS is more than a mere marketing effect. An SNS designed for elderly people has to take into account the special requirements of the elderly user without being stigmatizing. In 1999 the W3C (World Wide Web Consortium) developed guidelines for accessibility of websites (92). Based on these barrier-free design and also Design -for- all / universal design were created. The latter take care of the fact that there is not "an elderly" to represent the whole group of elderly, but elderly individuals in their own ways and rights. This is an established area; there are many books about it and we just outline a few points that ought to be considered in the design of a user interface suitable for a highly aged person.

Structure

A clear structure is very helpful for people that have little computer experience. As elderly individuals often take more time to process information, it is helpful to look at a clearly structured layout that makes it easy to comprehend what it says. Besides, meaningful headings and short sentences make the content comprehensible.

Text comprehension

Elderly users find it sometimes difficult to concentrate and to comprehend text. Developers are often young and used to their own language and up-to-date jargon. Many languages use Anglicism. Many elderly users will not understand these. Short sentences are a lot easier to comprehend than long ones. A message is easier to comprehend when highlighted.

Readability

In order to compensate declining vision readability can be improved by a suitable typeface, an adjustable type size, and high-contrast colour combinations -avoiding blue and green combinations as they are often difficult to distinguish due to the changes in the eye.

Navigation

Elderly non-experienced computer users can be supported by a consistent layout, e.g. the use of same icons throughout all pages, the navigation buttons always at the same place, etc. Some seniors find it difficult to comprehend browser tabs and multiple windows. Buttons should be easily identifiable and large enough to also be

usable by users that find it a little difficult to make precise movements. Easy clicking is important. Some senior users find double clicking with a mouse difficult and these should, therefore, should be avoided.

Support

Nielson (78) points out that error handling has to be made easy for seniors. He suggests placing the explanation of the error/help function prominently at the site, and focusing “on the error, explaining it clearly, and making it as easy as possible to fix”. He also points out design changes of a website should be avoided. He found that a lot of senior citizens write down the steps they take when using a site and drastic changes on the design cannot be handled.

Social networks for older senior users should contain contact information in case a personal contact to the users is necessary.

5.4 Improving Skills

Lack of skills has been identified as one of the major barriers to joining an SNS. Mostly this will be related to computer literacy.

Personal attendance and training are very important when introducing highly aged people to SNS. Training elderly people is different from training young people. Nielson (77) reports that almost half of the seniors he attempted to train felt obviously uncomfortable. Unlike younger users they like to stick to known paths and do not like to try something different. Many elderly individuals get discouraged easily and often tend to give up. When a problem occurred 90% of the senior users put the blame on them compared to 58% of the youngsters. In comparison to the young people the seniors worked much more methodical; this made them slower.

Some authors have classified internet users according to special traits (see 16.2). It might be worthwhile looking into this and to build on this when training an elderly person.

Sauders (93) found that the elderly think they profit more from personal instructors than from manuals. They find manuals are helpful if they are “step by step”.

Improving skills is closely related to self-esteem and motivation. These will be dealt with in the following chapter.

In Join-In we found that many elderly users were very hesitant to using the computer. Many users seemed to be scared and it took them 1-2 lessons before they felt comfortable.

It took non-experienced computer users on average 1.5 h to learn how to use the mouse. Touch screens did not offer an alternative as often it did not react to the touch of a senior person and the large screen made it difficult for the users to find their bearings.

Elderly persons, who own a PC, often only knew one functionality (usually email) and still required intensive training.

If something did not work, the Join-In users tended to blame themselves (Hungary).

Join-In users in Germany asked for a manual on top of the individual training. They did not use the online help fun function, but wanted a printed copy next to the computer.

6 Motivation

6.1 Theoretical perspectives and concepts

Motivation is based on the latin word “motus” = “Movement”. The term motivation, as used in psychology, is the force that initiates and guides behaviours (94).

According to Stangl (96) two major motivation concepts can be distinguished

- One concept sees a being as somebody ruled by instincts, hormones, external influences or drives, which means that man’s behaviour is somehow ruled
- The other one emphasises man’s free will and his freedom of constantly redefining oneself (behaviourism)

Motivational psychology researches “why” are we doing what we are doing and “how” are we doing what we are doing. It tries to explain the direction, persistence and intensity of a purpose-full behaviour. According to Heckhausen (97) there are two basic strategies concerning motivation

- the tendency to organising one’s behaviour in a way that will either ignore things that are considered less important (fully concentrating on successful criteria (“goal engagement”))
- or to actively deactivating the original goal and finding new goals along the way (goal disengagement).

Several theories may be distinguished according to the degree whether it is instinct or behaviourism that determines motivation. One of these is the “Incentive Theory”, which states that behaviour is motivated by incentives, i.e. external stimuli, which push you towards a desired goal.

Maslow's Need Hierarchy was founded by Maslow in 1943 and is much used in psychology. It is based on the observation that human needs have different priorities and that basic needs must be satisfied before needs that are lower in the hierarchy. The needs are made up of biological and social needs. The hierarchies are laid down in a pyramid (Fig.10) (98), (99).

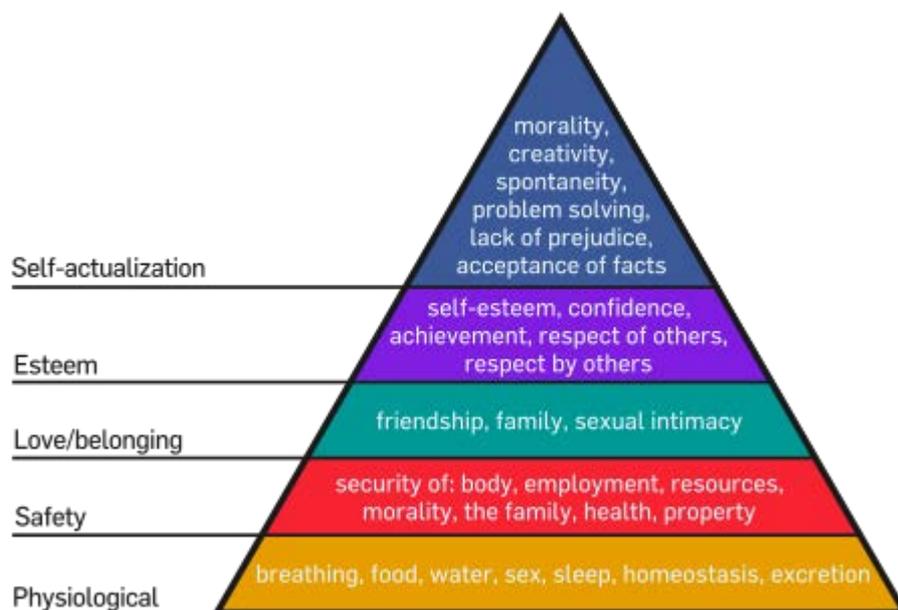


Fig10 Maslow's Need Hierarchy. Source: (100)

6.1.1 Intrinsic and extrinsic motivation

Social studies primarily use the “intrinsic and extrinsic motivation theory. An intrinsically motivated person does something because he/she likes doing it; it means fun to him doing it (100). Intrinsically motivated people attribute their results to factors under their own control and believe they have the skill that will allow them to be effective in reaching desired goals (i.e. the results are not determined by luck). They are interested in mastering a topic.

An extrinsically motivated person does something because he gets something from outside as a reward for performing a given task. Competition is usually extrinsic as it prompts the user to win (101). These rewards provide satisfaction and pleasure that the task itself may not provide.

6.2 Motivation in the elderly

Up to now the motivation behind everyday behaviours in old age is not quite understood. Vallerand (102) used a model developed by Deci (103) for motivation in young adults and transferred this to motivation in the elderly. He distinguishes four types of motivation: intrinsic, self-determined extrinsic, nonself-determined extrinsic, and amotivation). “Intrinsic motivation” is perceived as the most self-determined motivation. While an intrinsically motivated person does something because it is fun or pleasure, i.e. for the activity itself, an extrinsically motivated person does an

activity for a certain reason. A self-determined extrinsically motivated person would give a reason like: "I do this because it helps me keep fit", a non-self-determined person extrinsically motivated person will say: "I do this because people will consider me clever". Amotivated people cannot link behaviour to outcomes and they are not motivated at all. More self-determined forms of motivation lead to more self-esteem, greater life satisfaction, and have "positive effects on health in stressful situations" (102). Vallerand points out that many studies found that the elderly's feelings of self-determination, wellbeing and intrinsic motivation were increased by being given choices.

Other vital factors that influence the elderly person's motivation are self-efficacy and the perception of competence. Bandura's self-efficacy theory (104) states that "people who regard themselves as highly efficacious attribute their failures to insufficient effort, those who regard themselves as inefficacious attribute their failures to low ability". However, support of self-determination in the elderly is only successful, if it concerns an area that is of importance to the elderly (105). It is worth noting that if elderly individuals feel they have to join an activity or that they are forced to perform a certain task their self-efficacy and self-determination decrease. Perceived social inefficacy increases an older person's vulnerability to stress and depression.

Bandura (106) points out that peers have a major influence. Peers who succeed, impact self-efficacy positively, while peers who fail make the elderly observer believe that he/she in the same situation will also be failing. He also showed that verbal persuasion leads to a greater effort and supports self-efficacy.

Reisenwitz (107) put the internet use of older people in relation to personal traits and found that the most active internet users were those who were more innovative, less risk averse and less nostalgic. Hannon & Bradwell (108) classified senior users according to their psychological approach toward using the internet into

- "the *non-line outsider*, who is not generally averse to using the internet, but is hampered by fear and uncertainty;
- the *tech sceptic*, who is critical of technology and resentful of pressure to become connected;
- the *cautious toe-dipper*, who has tentatively embraced the internet for basic tasks but is wary of trying new websites, software, or deviating from trusted brands; and
- the *digital trail-blazer*, who is adventurous about trying out new things on the internet and is evangelical in his enthusiasm."

They further found that specific older age groups stood a high chance of belonging to a certain one group. This, for example, people over 75 were more likely to belong to

the “non-line outsider group”, while people 55-65 years of age were more likely “tech skeptics”.

6.3 Motivation through technologies

Games and gamification are more and more being viewed as motivational supporters. Persuasive technology aims to influence a person’s attitude and thus to change the individuals behaviour (107). Presently it is attained a great perspective in healthcare. It can offer a new way to motivate elderly persons. In the Join-In report D 5.1 Requirements and State of the Art in Exergames (108) the following strategies are recommended

- display information to encourage people to be more active;
- record and display the users’ past behaviour so that they can compare with their current behaviour;
- provide positive reinforcements to improve behaviours;
- make the user interface attractive and friendly;
- provide the information at opportune moments and do not to disturb gameplay
- use social influence.

In the report the authors describe what strategies game developers have identified to benefit the senior users and which they like. Some special requirements of elderly users have also been identified

- concentration: the concentration of an elderly person differs from the one of a younger one; seniors find it difficult to concentrate on 2 different items at the same time. This means that the players should either concentrate on the game or the exercising.
- difficulty: an elderly person gives up easily if a game is perceived as being too difficult
- feedback: the elderly are very sensitive and frail concerning any failures. They tend to blame themselves and to give up. Feedback, therefore, is vital and it has to be positive and reinforcing

Some studies looked at the effect of socialising with people not being in the same place. More information can be found in the same report.

6.4 Motivation – physical activity

Physical activity benefits physical, but also mental health. Within the European project SHARE '(Survey of health, ageing and retirement) a study was performed over 2 years with 17,500 elderly people in 11 European countries to assess whether physical activity and mental health were associated. It showed that people who exercise regularly have a lower risk of developing depression in old age and that depression prevents people from exercising. (109). Exercising lowers risk factors in chronic diseases and yet elderly people find it difficult to be physically active. Self-efficacy has been shown to impact exercising behaviour positively (110).

Bennett (111) analysed different approaches and found indications that the following approaches might motivate highly aged persons to exercise

- Individual advice of a healthcare professional
- Illness
- Personal coaching and follow-up by telephone.
- Further research is, however, required.

Mueller (108) found exercising with others increases motivation and also the effectiveness of an exercise for some people.

6.5 Motivation in the elderly –in physiotherapy/rehabilitation/sport psychology

Motivation has an effect on the outcome of a treatment (110). Keiba (111) analysed some studies on motivation in the elderly in rehabilitation. He found that in sport psychology literature females and the elderly persons were found to be intrinsic and self-determined extrinsically motivated. He also states that gender specific differences were found by a number of authors. Females showed a tendency for more self-determined forms of extrinsic motivation, and were found to be more intrinsically motivated than males. In rehabilitation, factors like "establishing goals, the use of humour, as well as having a caring, kind, and competent rehabilitation team" encouraged older adults. Domination and not believing in the success of a rehabilitation had a negative effect. Old patients want to go back to their way of life – this is a strong motivational factor.

A number of models (115), (116), (117), (118) were developed, which try to explain motivation taking into account –amongst others- the likelihood of the success, the costs/ efforts, the present situation and past experience. Based on such a model Kemp (115) and Resnick (116) explain that elder people often perceive the costs (risk of failure, risk of fall) as high and, therefore, tend to remain sedate and

present-oriented. From this they draw the conclusions that older adults need immediate and concrete achievements.

Phillips (115) uses the motivation model by Geelen and Soons (117) to arrive at the following practical advices

- set attainable goals to create a feeling of achievement;
- perceived costs, he names fatigue, should be considered positive outcomes;
- elderly people feel frail, safety should, therefore, be addressed;
- increase in competence by educating the patient.

He also states that observing peers in a similar situation doing well motivates many elderly persons.

6.6 Summary Motivation

Self-efficacy seems to be a determinant of motivation in elderly people and strategies should be implemented that will increase self-efficacy.

Practical Implications

Motivation in the elderly is a main topic in geriatrics, especially also for old people in nursery homes. Some of the recommendations which are also useful for motivation concerning the use of an SNS

- many elderly feel less valuable when growing old; encouragement and reinforcement can counteract this feeling. Approval of the accomplishments is very valuable to a person who feels frail. Also giving an elderly person a meaningful task, which could, e.g. be commenting on a new book or giving some advice, helps the person feel needed and included.
- meaningfulness is important to an elderly person. Empower the elderly by telling her/him why the SNS and related activities are important to him/her; in which way they support her/him.
- Consistency is important in motivating elderly people. Regular activities offered by the network might prove helpful.

In Join-In we used many different ways of motivating the users

- We established a very personal relationship and built trust with the users
- The users were actively involved in the developments of Join-In
- The SNS is “private” – this made the users feel “safe”
- We trained the users individually and provided support by personal contact, by offering as many training sessions as needed, and help-lines
- The trainers were instructed to raise self-esteem in the users
- The Memofix game gives motivating and reinforcing messages
- The exerbiking game offers peer motivation by biking with others
- The peer effect was used in the training sessions

7 Conclusions and recommendations

Social networks have gained importance in past years and the uptake of the internet is fast; however, highly aged persons are still missing out. We assume that this is even more so for homebound elderly persons as details on this group of elderly were not found

The use of the internet and of social networking sites is closely related and a lot of statistics on the uptake of SNS take internet availability as a basis. We showed that chances of getting socially isolated increases for the very old. IN the past years an extended social network has gained importance. Social networking sites provide a means to socialise, to meet someone new and to communicate. Members of SNSs may also profit from the knowledge of other members. Pew Research (122) analysed the social impact of belonging to a Social Network and found amongst others that “The average user of a social networking site has more close ties and is half as likely to be socially isolated as the average American”, that “Facebook users have more close relationships” and that “internet users get more support from their social ties”. The very old people should also profit from that.

Getting highly aged people to join a SNS is not always easy –even though “computer freaks” can also be found about this age group. In the preceding chapters we analysed different factors concerning internet and SNS uptake in the elderly and examined motivational aspects that may influence the highly aged target group. We pointed out that computer literacy has shown to have a positive effect on older adults.

In order to draw older individuals to social networking our areas need to be considered technology, content, skill, and motivation.

Technology: the technology has to be accessible, affordable and the infrastructure needs to be in place. As SNS for the elderly has to meet the special requirements of the age group. Usability has to reflect in the design of the SNS; changes of the site’s design should be avoided and –if necessary only be done in small steps. Usability requires a reliable and robust system.

Content: the content of the SNS has to meet the interests of the users. Meaningfulness is more important to this age group than to others and any social network has to include meaningful activities such as access to information which is of interest to the users, memory training and entertainment- just like Join-In.

Skill: the necessary skill has to be provided. The older person is likely to have to be supported; personal contact might be necessary to achieve the desired effect; the elderly may profit from the involvement of peers

might. Support has to be ensured at all times.

Motivation: building motivation and supporting self-efficacy is the primary requirement with many prospective older users. There are many studies which show how lack of self-efficacy will negatively impact training, literacy, and the uptake of computing. Self-esteem might be low with persons because they are feeling “left out”. As the number of highly aged people is growing, social participation of this age group needs to be supported. A first motivating step could be educating the users on the advantages gained by the use of the SNS.

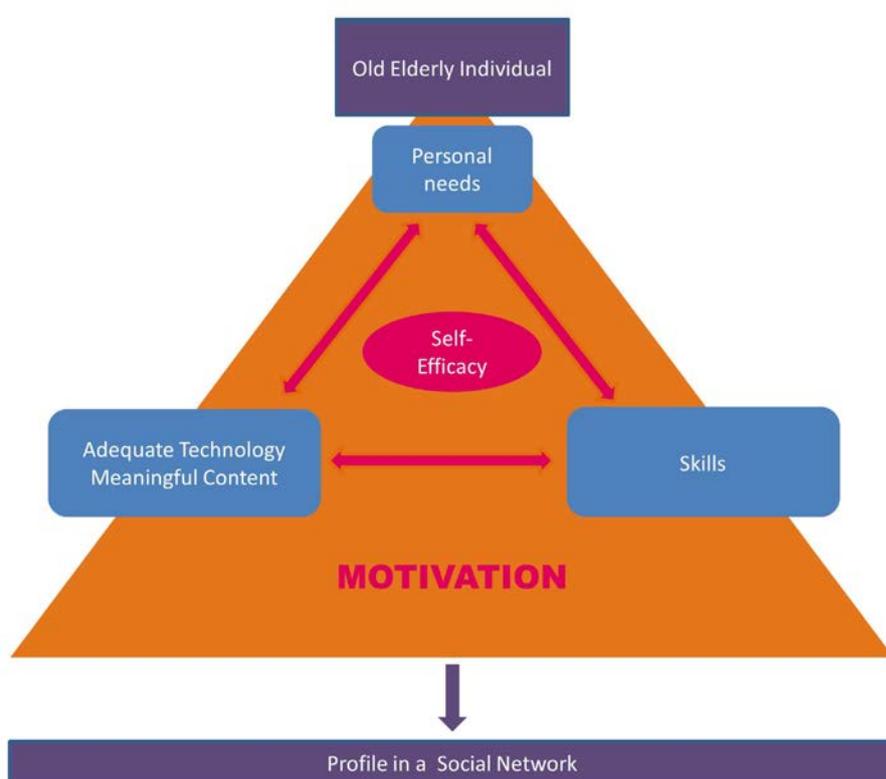


Fig. 11 Join-In Model for attracting Elderly Persons to a Social Networking Site

In Join-In we saw that being able to use a computer means “inclusion” to the elderly person. IT offers the potential to raise quality of life, and to enable participation in society. Social carriers should look into this issue. Older elderly people might, for instance, act as ambassadors on social networking to other highly aged persons. Other means of participation have to be found. Social carers and communities have to seek possibilities to include the highly aged people, e.g. through engagement in voluntary work, e.g. peer-to-peer support. This will benefit all of us.

Some elderly people consider SNS to be a place for young people and that joining means they will have to develop a different personality. This is something that

needs further research.

The internet is becoming a vital source for seeking health related information. Also the involvement of patients in their own healthcare is done via digital media. Health is an area which is of major interest for the elderly. Chu (55) showed a reduction in computer anxiety and an increase in computer confidence and computer self-efficacy in retrieving and evaluating online health information. Lack of access will be another source for non-participation. Social networking sites for elderly could link to health care sites and thus raise the elderly individuals' interests in IT.

New media like tablet computers and smart phones might facilitate the access to IT for the older individuals. Tablets are considered to be more intuitive and seem to be well accepted by the elderly. Whether they can meet the requirements of the highly aged persons remains to be seen.

Little is known about homebound elderly people. Most studies concern elderly person living in homes for the elderly. Access to homebound elderly people is not easy and needs to be done via persons, who will, in many cases, be carers. People are getting older and thus the number of homebound people will be growing. The number of single households is also increasing which is an additional threat of social isolation. This needs to be counteracted. Social networks offer the possibility for participation -also for this group. Studies are required to assess the specific requirements of this group. Though this can built on the results of Join-In, such a study has in many cases to allow time to gain a homebound person's trust and confidence. It should also be built on lasting results. To release a person who is socially isolate from his/her loneliness for only a limited time-period is unethical.

A lot of issues have been shown to be related to education but also to income. This is an issue where the public sector comes in. Councils could team-up with voluntary organisations. Special events could help to increase awareness. Access should be facilitated by offering training in public areas. Educating and integrating this user group might be costly in the beginning but pay off in the long run.

The Join-In Social Network has been shown to benefit highly aged people. It offers meaningful activities which train the physical and mental abilities of the older users. The "holistic" approach offering a social networking site including a digital game, an exergame and video-conferencing facilities – all of them developed for the elderly user- proved to be right.

The "Join-In Interactive Social Portal" was well received by the elderly users. They appreciated that the activities meet their needs and that they were able to learn computing in a closed and safe surrounding. Elderly individuals who feel lonely and are looking for new contacts profited most. The training with the users was intensive but rewarding. Join-In is a valuable application to train the highly aged on computer use, to make them gain confidence and self-esteem.

Join-In's recommendations on introducing social networking with highly aged users are

- Provide affordable, secure and usable technologies to a target group that has been clearly defined
- Encourage the elderly to act as contributor to her/his own motivation, behaviour and development
- Meet the user' interests and include functions that the users consider useful
- Address any barriers the highly aged person might have
- Provide training to overcome computer illiteracy
- Help the elderly to gain new skills; this will make the elderly confident
- Inform the user on the activity; if the user feels an activity is important to him/her he/she is more likely to do it
- Provide trust and attendance to the elderly users
- Set up groups with people in the same situation; this encourages many elderly users.
- Give positive reinforcement to the elderly person; support self-efficacy.

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Appendix A - A Short Computer History

With a target group 75+ it is obvious that we are addressing an age group that did not grow up with computers. It might be worth remembering that

In 1938 the first computer was invented; a 75 year old person of today was born. In 1941 Thomas J. Watson thought that a few computers worldwide would be all that were needed.

In 1951 the first serially produced computer was released by Remington Rand; a 75 year old person of today was 13 years old.

In 1954 it was demonstrated that computers could support office work. End of the 50-ies around 8.000 computers had been installed worldwide. Till the end of the 60-ies computers were only for specialists.

In the 1960-ies mini-computers were released in the USA. In the 1980-ies computer automated machines and robots were more and more used in car production and shortly after in many industrial productions world-wide.

The first PC was invented in 1975 when a person now 75 years was 37 years old.

In the 70-ies Apple started developing the first graphical interface and in 1983 they brought "Lisa" to the market, a computer with a graphical interface and a mouse [<http://www.bernd-leitenberger.de/pc-hist1982-2000x.shtml>]. (Today's 75 year old is 45).

Christmas 1990 the first WorldWideWeb browser/editor is being demonstrated.

In 1995 shows WWW to the European Media. By now our 75-year old is 57. Now more and more people buy PCs for their own homes mostly because they want to use the internet and play computer games.



Fig. 12 Computer Development

Zuse Z11,

Apple Lisa

iPad

Source (113)

Source (114)

Source: (115)