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**Deliverable D2.2_User Requirements for System Functionality
and User Driven Content**

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**Ambient Assisted Living project
ICT concept for smart ageing seniors**

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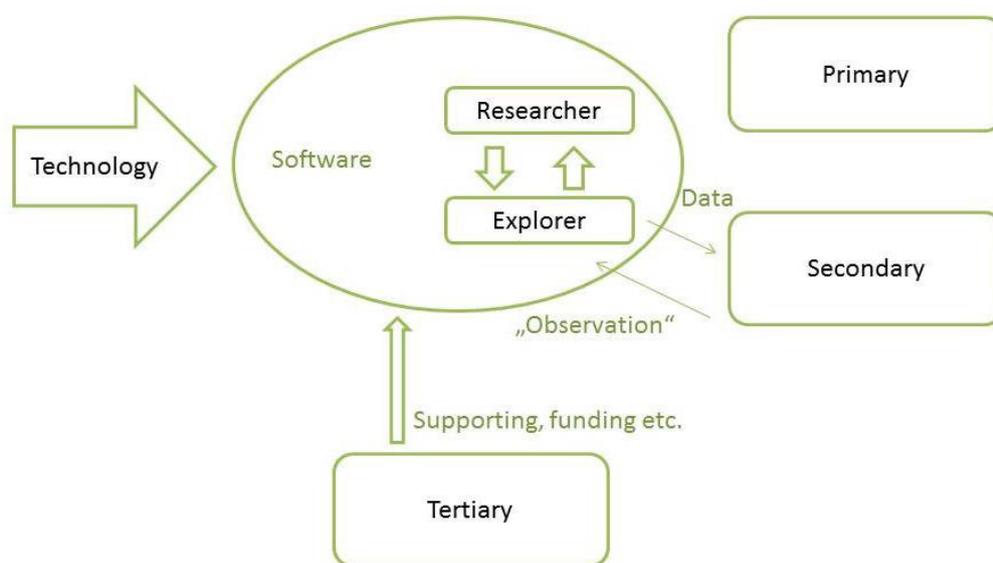
1. Introduction – MobilityMotivator in context of ICT and prevention for elderly people

The significance of the problems associated with the mobility of the elderly, including the prevention of isolation or other types of exclusion and the maintenance of good health has led to the creation of the European program, Ambient Assisted Living (AAL). Call 4 of this programme specifically targeted the solutions to improving mobility inside and outside the home. The Mobility Motivator project aims at developing ICT based solutions to encourage greater mobility amongst seniors using geo-localised "Serious Games" for inspiring outdoor activities and video based systems to encourage and monitor exercises and treatment at home.

The aim of the project is the development, implementation and validation of a system allowing elderly to maintain or even enhance their self-controlled range of mobility. Apart from physical activity this system will have to stimulate cognitive and mental resources of the elderly by specific training sessions. Cooperating end users are acting as researcher (located at home) or explorer (mobile) and have agreed to jointly meet a pre-defined task. These functional involvements can be swapped for each consecutive task. To build up a mutual gaming context, researcher and explorer get in contact with each other while situated at home. The researcher will set a mobility program for the explorer (e.g. visit a local park). The explorer, using his smartphone or tablet PC, embraces for his excursion and can communicate with the researcher via integrated video chat if desired. The entire route and its already left behind section can be documented via

GPS-signaling. With the completion of such a specific task, the game is over; users are accounted an individual mobility score and another game can commence. As optional add-on, the task and the performance of the gaming seniors can be analyzed, surveyed, monitored and evaluated by professionally integrated health experts (e.g. care professionals, practitioners), who can also provide telecoaching.

Figure 1: The MobilityMotivator Project



Source: IAT 2013

1.1 Theoretical background of the evaluation process

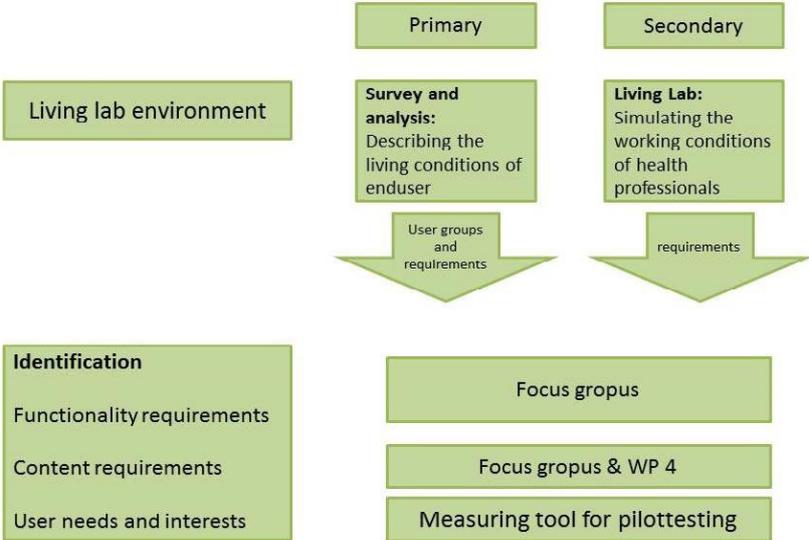
In general one can postulate for the commencement and outcome of such measures: “The earlier the better”. A recent Swedish study could show that increased physical mobility is beneficial even at advanced age (Byberg et al. 2009). The authors investigated the effect of mobility programs for people, who commenced with increased mobility at the age between 50-60 years. After five years duration, no reduced mortality rate could be observed in this group compared to non-participating seniors within the same age group. 10 years after onset of increased

physical activity at this age, mortality rates lowered down to the level of those people who had started with increased physical activity much earlier. This result correlates to studies of Hakim et al. (1998) who found that even moderate, yet regular physical activity programs in healthy male seniors resulted in extended life expectancy by up to five years.

In general, measures of health prevention and promotion at advanced age aim via multiple support systems and their respective components to avoid specific diseases and physiological reduction in order to facilitate an independent, active life (Kruse 2009). An important component in this context is the widely faceted and enhanced utilization of information and communication technology (ICT). Accordingly and in response to the demographic change, serious games have become an important trend over recent years.

This paper shows the first part of the evaluation process. The integration of end users into the innovation process can be regarded as the central aspect of the project.

Figure 2: Evaluation of MobilityMotivator

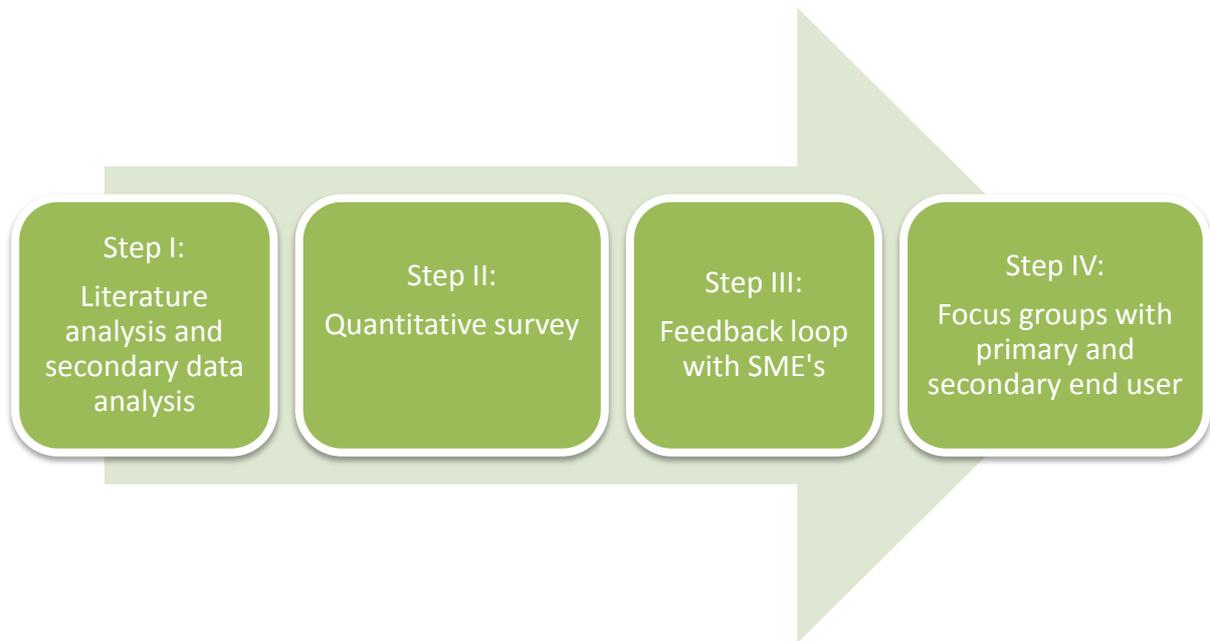


Source: IAT 2014

1.2 Method

The method of this report can be described as a 4-level-process:

Figure 3: 4-level-process of the report



Source: IAT 2014

- (1) The secondary data analysis describes the use of the internet by older persons. The literature analysis focuses on the effectiveness of serious games with a special view on elderly users.
- (2) As a second step the research team conducted a questionnaire-based survey with 970 participants. To disseminate the questionnaire, two strategies were used: A paper-based version was spread via mail to customers of German Red Cross in Düsseldorf and Mettmann in, an online version used the SosciSurvey of the TU Munich.

The questionnaire focuses on:

- Socio-demographic data (sex, age, education, income);

- Self-related health Status (Quality of Life Index; WHOQOL-8);
- Activity index (daily life and sports activities, barriers of activity);
- Self-responsibility in health;
- Use of technical equipment;
- Self-efficacy (general and special focus on technical acceptance).

The data set was evaluated with SPSS (see section 2.3. for the results).

- (3) In cooperation with Inventya the IAT prepared a factsheet for the technical partners of our project to identify which information about older persons could be important for the technical development process. After this IAT and Inventya had several telephone conferences with the small and medium enterprises (SME) involved in the project.
- (4) Focus groups with primary and secondary end users were set up to gain deeper insights into the needs of the elderly with a special focus on software solutions. Furthermore, the focus group interviews will seek information on potential strategies, model policies and programs that support mobility. Research teams will undertake a minimum of two focus groups in each country.

The guidelines for the focus groups were as followed:

- Participants will be recruited from the potential user groups.
- Each group will ideally have eight participants (minimum of six and a maximum of ten). Researchers are encouraged to include a diversity of older people in their focus groups.

- The interviews groups will be recorded with either digital or tape recorder.
- The interviews will be transcribed verbatim.
- There will be two focus groups “Functionality requirements” in each country (Germany and France).
- There will be two focus groups “Content requirement” in each country (Germany and France).
- There will be two focus groups “User needs” in each country (Germany and France).

The aim of the focus group with the primary end users is to evaluate the handling of technical devices by older persons. The members have to solve specific tasks with different devices (Smartphone, Tablet PC). The researchers observe the behavior of the elderly and intervene as little as possible. After the observation there will be a group discussion about the experiences.

2. Identification of functionality requirements (primary enduser)

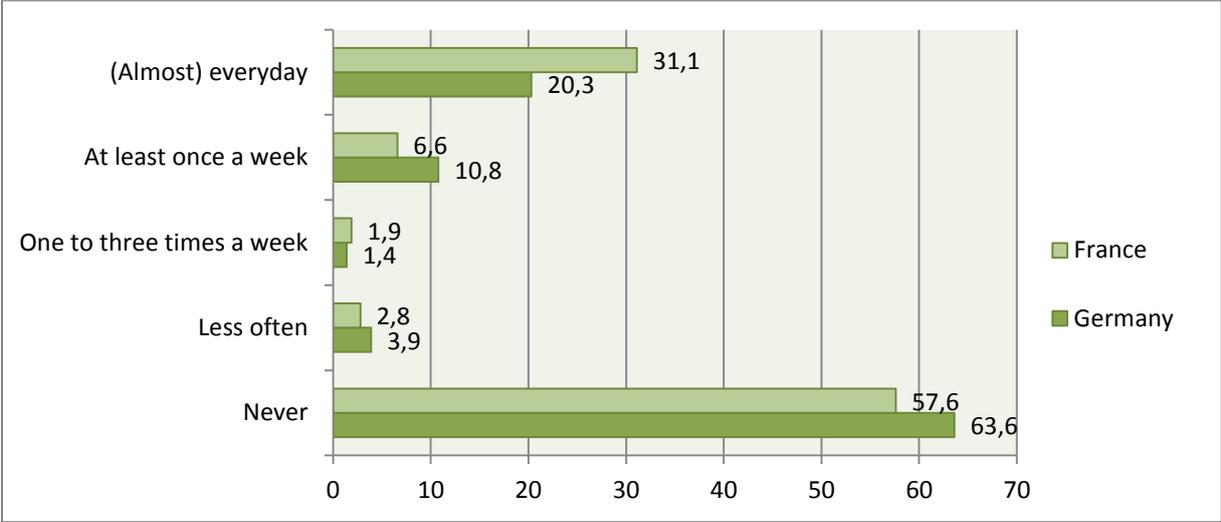
2.1 ICT for Elderly

Technology can have two sides: On the one hand innovative solutions can help people to participate in their community and hence support social inclusion; on the other hand technology can lead to exclusion (“digital divide”). Up to date, stereotypes of the elderly – like frailty and poorness – are still applied. The same is true when it comes to technical aspects; older persons are often regarded as not capable to use technology. Indeed, studies show, for instance, that the use of the internet is declining with increasing age, but these results cannot be generalized. The elderly are not afraid to use ICT and instead are willing to learn how to use new technologies – if the technology is reliable and meets a certain need (Malanowski 2009: 112, originally McCreadie and Tinker 2005).

2.2 Results from the data analysis

The accessibility of the internet can be seen as a central requirement for many ICT-based products and services. This also applies to the project “MobilityMotivator”. Therefore general access and use of internet have to be considered as general functional requirements. It can be noted that the daily use of internet of older people compared to the total population is rather low. However, considering the German population, the group of older people has the highest growth rate (InitiativeD21, 2013).

Figure 4: Use of the internet other than for work, 60+, Comparing Germany and France (in percent)

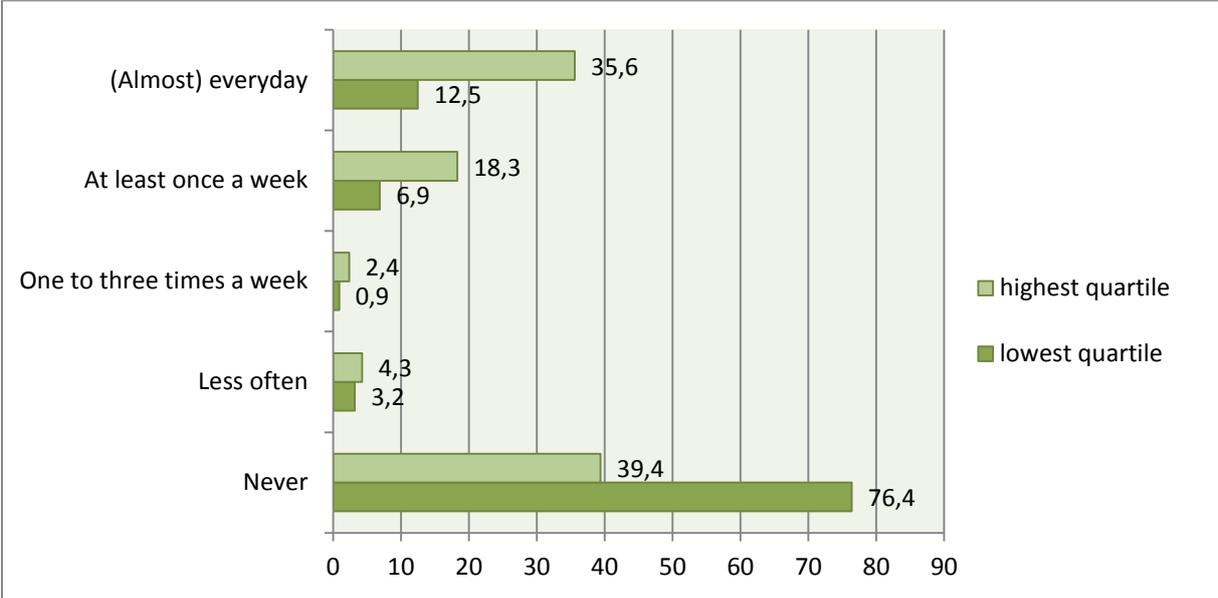


Source: EQLS 2012

Comparing Germany and France differences can be seen: Particularly noteworthy is the different proportion of people who use the internet almost every day. With nearly every third older person in France the rate is much higher than in Germany (20.3%). Considering persons who never use the internet the difference between the two countries is not significant (58% in France compared to 64% in Germany).

Another striking point can be seen in the digital divide, which is influenced by social inequalities. This is illustrated by the factors gender and income for Germany in the following section.

Figure 5: Use of the internet other than for work, 60+ in Germany, differentiated by income (in percent)

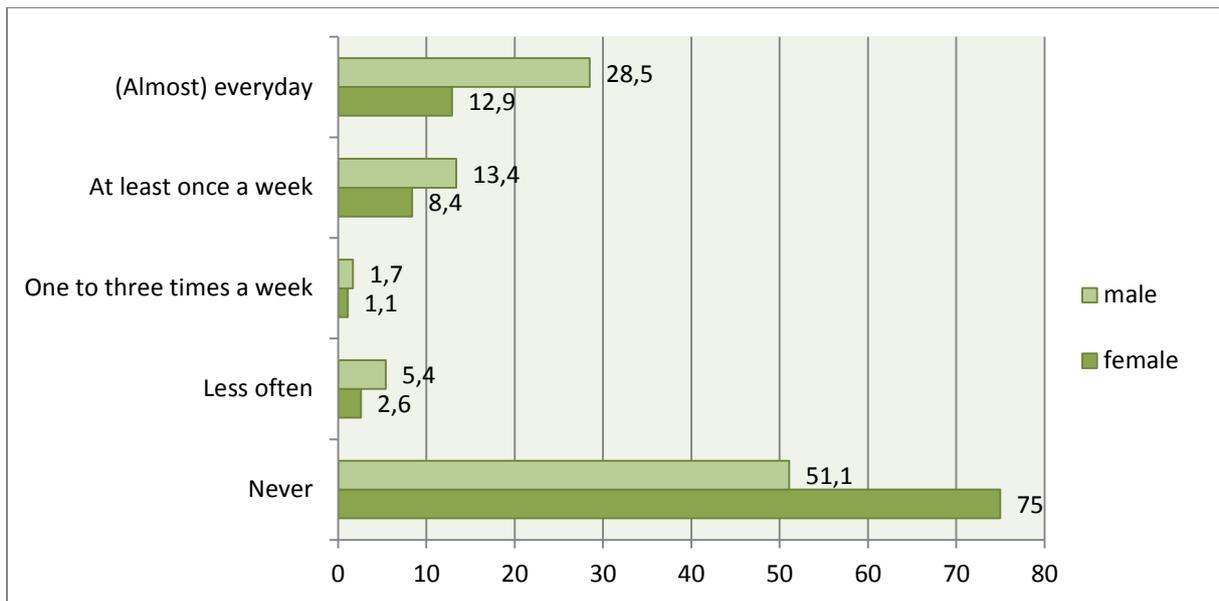


Source: EQLS 2012

Figure 5 shows the access of internet in Germany according to income. It becomes clear that there is a high correlation between internet access and income: While more than one third of the high-income elderly use the internet every day, only slightly more than 12% do this in the group of low-income elderly. Another noticeable difference can be seen in the group of “Nonliners”¹: 40% of high-income elderly never use the internet as opposed to more than three quarters of the low-income elderly.

¹ People which do not use the internet.

Figure 6: Use of the internet other than for work, 60+ in Germany, differentiated by gender (in percent)



Source: EQLS 2012

More than one quarter of the male and only 13% of the female persons aged 60 and more use the internet on a daily basis. Still, every second male person never uses the internet as opposed to three quarters of the female persons aged 60 plus.

In summary, it can be seen that the majority of the older persons does not use the internet on a regular basis in Germany and in France. Furthermore, social inequalities have a significant influence on the use of the Internet of older persons. This applies especially for the factors income and gender.



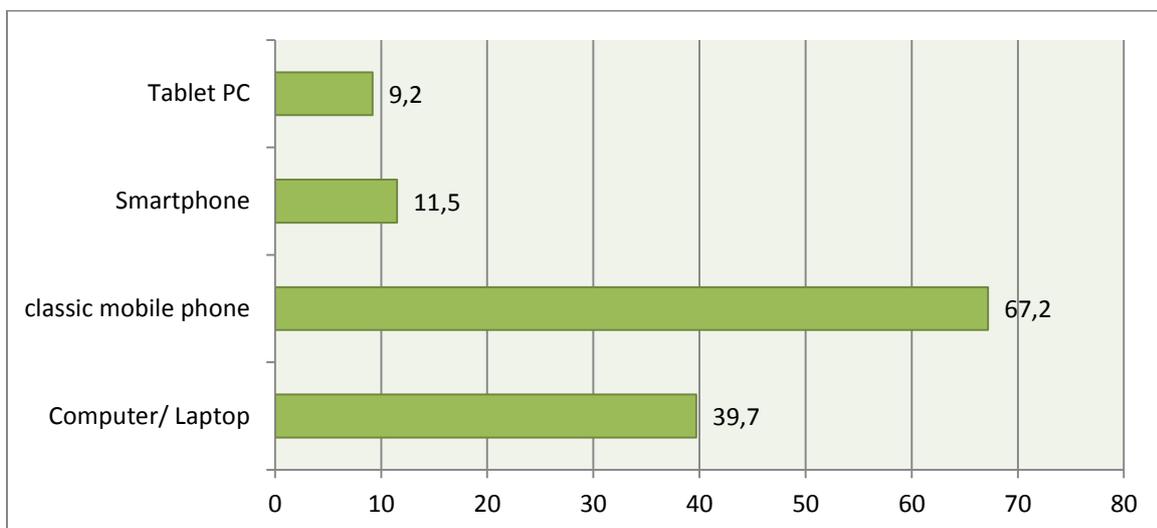
In a nutshell...

- MobilityMotivator wants to improve activity and cognitive skills of older people.
- More than half of the potential target group is not yet active in the Internet.
- Older people in France are a little more active in using the internet as in Germany.
- The use of internet correlates highly with the factors income and gender.

2.3 Results of the questionnaire

The next graph shows the distribution of modern technologies which can be used in the MobilityMotivator project in senior households.

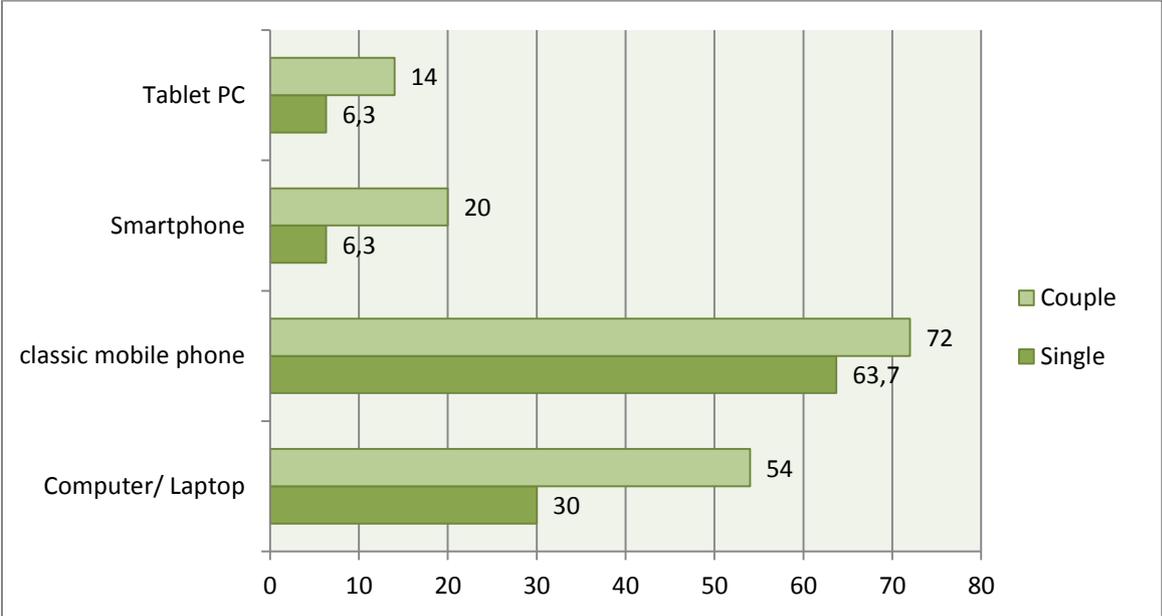
Figure 7: Use of modern technology by older people in Germany (n=143) (in percent)



Source: IAT 2014

It can be seen that modern technologies like Tablet-PCs or Smartphones are not very popular in senior households in Germany. At least two-thirds use a classic mobile phone, but this kind of technology does not fit to the technological requirements of the project (internet accessibility and GPS). Only 9.2% of the sample own a tablet-PC and only 11.5% a smartphone.

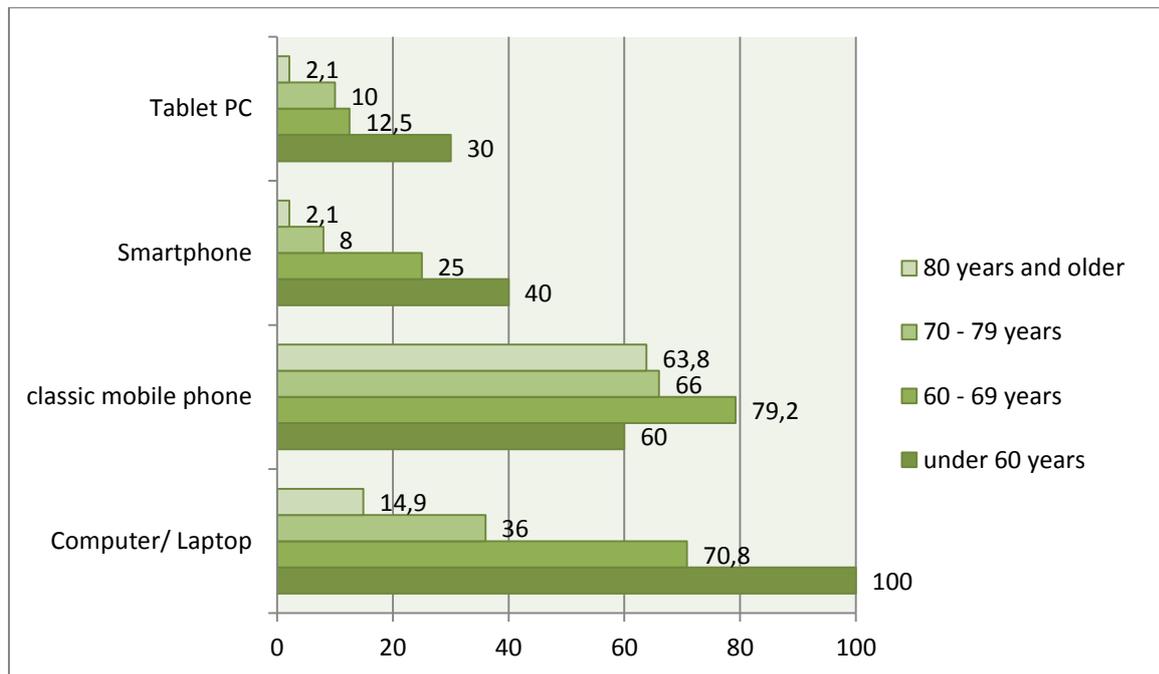
Figure 8: Use of modern technology by older people in Germany, differentiated by household type (n=143) (in percent)



Source: IAT 2014

The size of the household represents an important factor, because the use of technology is related to the social environment (Pelizäus-Hoffmeister 2013). There are significant differences between single and couple households. Particularly striking are the differences in using computer/laptops, tablet-PCs and smartphones. Only in using mobile phones the differences are less significant.

Figure 9: Use of modern technology by older people in Germany, differentiated by age (n=143) (in percent)

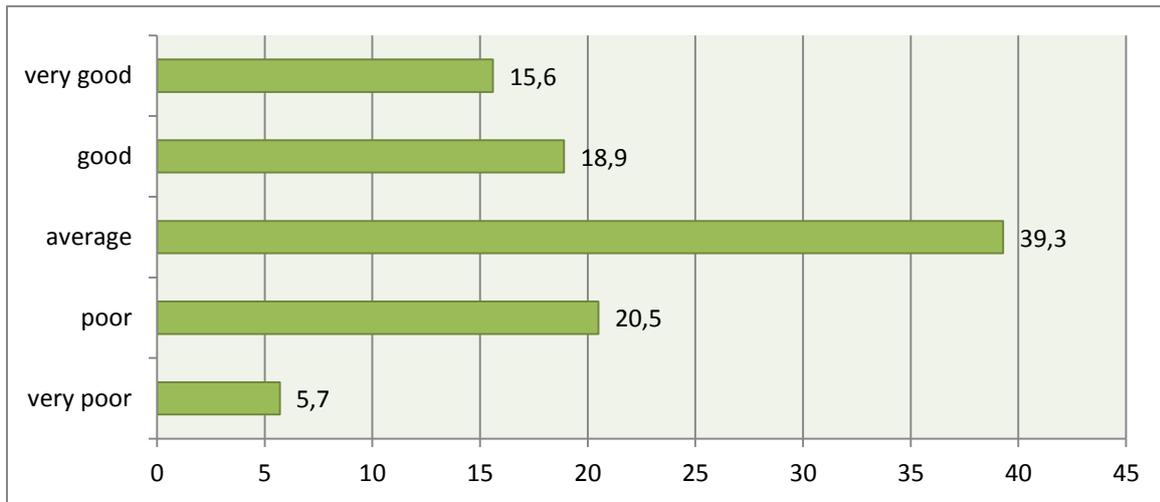


Source: IAT 2014

Another important influencing factor is the biological age. It is shown that with increasing age the use of modern technologies is steadily declining. The only exception is the classic mobile phone. It turns out that especially in the group of very old people (80+) the distribution of smartphones and tablet-PCs is very low (2.1%).

In the paper version of the questionnaire, the test persons should evaluate their handling with technical hardware themselves:

Figure 10: Self-rated handling of technical products, 60+ (in percent)

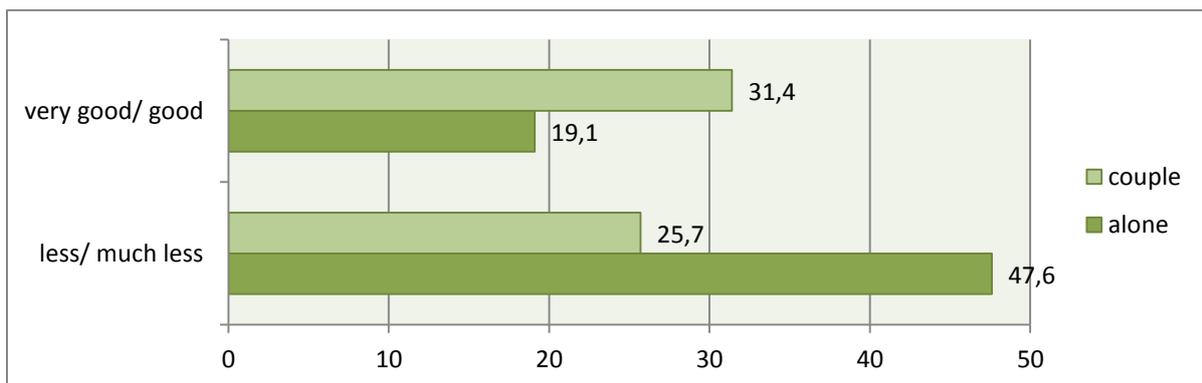


Source: IAT 2014

Every third person self-evaluates the handling with technical hardware as good or very good. However, more than a quarter of the persons included in the sample self-evaluate the handling as poor and very poor. The predominant part chooses an average self-evaluation.

It is shown, that the factors „household size“ and „age“ have a significant influence on the self-evaluation.

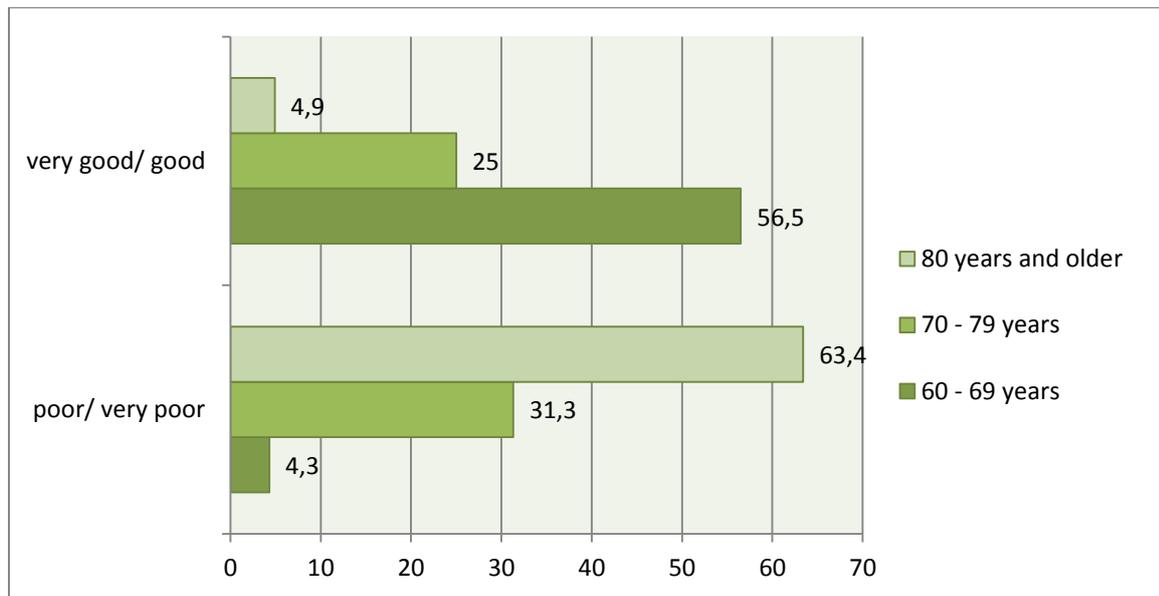
Figure 11: Self-rated handling of technical products, 60+, differentiated by household type (n=143) (in percent)



Source: IAT 2014

Nearly half of the people, who are living alone rate their handling of technical products as poor.

Figure 12: Self-rated handling of technical products, 60+, differentiated by age (n=143) (in percent)



Source: IAT 2014

Figure 12 shows that a good or very good self-evaluation declines with increasing age.

2.4. Results of the focus groups

In the first part of the focus group discussion, the handling with technical hardware was picked out as a central theme. In this connection four problem areas unfolded:

2.4.1 Functionality requirement handling

The discussion showed that the handling of technical hardware is commonly connected with problems for almost all of the participants, even though it has become an important part of today's life– from programming a digital alarm clock to the handling of a washing machine. Constant use of loanwords is experienced as especially annoying:

„My mobile phone says, I just shall use the „widget“. But what is a „widget“? It is assumed that everyone knows what it is, but I don't!“

The question, how a technical device should be constructed so that older people can handle it, led to a consistent answer:

„It has to be simple.“

The washing machine is mentioned as a positive example in this context:

„Colored laundry 40 degrees, set up, ready and done“.

Usually it is mentioned by the people that they have a big fear to break something during the handling of a technical device:

„It happens very quickly that I push the wrong button on the TV and suddenly all channels are shifted.“

It is criticised that in most cases the devices are not constructed in a way older people can handle them:

„Usually the fonts and keys are so small that you can't read and handle them properly with a light visual impairment.“

Generally it is determined that technical hardware is initially experienced rather negative by older people. But when they first get into the hardware, more positive aspects are mentioned. In the subsequent praxis test, this was confirmed. Especially the probands who had no experience with tablet-PCs or smartphones, faced the technology rather critical and cautious. After a short introduction, they become more and more involved. Starting applications on the touchscreen is rated as very easy by people with no experience with technology and succeeds after a short learning phase considerably faster than using a PC mouse. Simple assignments of tasks (photography, starting and quitting applications) are learned quickly by the probands. Group dynamics are developed, in which experiences are shared among each other.

The size of the display plays a major role. Probandes could use applications on a 10" display with no problems, also an 8" display turned out to be mostly applicable. Though, a part of the probands has trouble to decipher fonts and hitting the control panel on a 5" display.

2.4.2 Functional requirement Equipment

It appears that many older people are overstrained with the equipment of modern hardware:

„When I want to have a mobile phone, I must be able to use it for telephone calls. It doesn't have to be able to play music and I don't want to use the internet with it!“

Furthermore, many of the focus group participants mention that the equipment of modern hardware does not fit to the needs of older people. It was asked why only a few of the group have a smartphone. The following reasons were mentioned: Too expensive, too complicated and useless. However, it appears that the predominant part of the group already had some experience with the internet. The internet is used to get information (Travel reports, test results, kitchen recipes) or to communicate with relatives:

„I always write emails with my granddaughter, she doesn't know common letters and postcards anymore.“

For communication in general they use the internet and especially emails. Only a few probands already have experiences with chat- or video conferences.

2.4.3 Requirement Support/ Instruction

Older people mention „support“ and „instruction“ as especially important. The user manuals for many devices were criticised:

„They often appear very short and they say I can download the long version on the internet.“

Furthermore it is criticised that user manuals often appear to be incorrect and are translated in too many European languages. There exists a request for a user manual only in the mother language and it shall be in adequate font size and in printed form. Another problem is the use of too many loanwords.

A well working support system is seen as very important – especially for people who live on their own it is important to have someone who could help with problems:

„I am alone and my children and grandchildren are living far away and can't just come over. If something doesn't work anymore, it stays broken until I get the next guests, or I have to order someone for much money.“

Experiences with technical hotlines were mostly rated negative:

„Usually I'm on hold for a very long time and they can't help me either in the end.“

On the disposal the lack of consumer protection is as well criticised:

„The sellers always want to palm the newest hardware with the highest costs off on me. Nobody minds what I really need.“

2.4.4 Requirement Data security

Data security is not seen as a relevant problem for most probands since they think that it does not play an important role:

„They can have whatever they want. I don't have something to hide.“

Much more problematic is the intransparence of contracts. It is criticised that no one provides detailed information about the duration or possible additional charges.

„If you place a mobile service contract today, you don't know what they really palm off on you!“

In summary it is adhered that modern technology is seen as a barrier by many older people, but once the barrier is conquered, they're ready to get into the technology.

It becomes apparent that especially in a group which includes both technically experienced and technically unexperienced people group dynamics are developed, which could be described as „learning from each other“. The fear of breaking something is seen as a major problem.



In a nutshell...

- It must be assumed that the most possible users do not have the required hardware available.
- Specification of the role of secondary endusers with respect to future business models have to be defined.
- The system has to contain a detailed and comprehensible user manual for the targeted group. The manual should be developed in cooperation with the targeted group.
- The control panels have to be designed in a way that they can be used by persons with age-related function limitations.
- A special challenge is to address seniors who are living alone. A functional support system has to be constructed for them.
- Other focus groups will be followed by "Hands-on" sessions, providing potential endusers with specific h/w and s/w step-by-step solutions such as user-interfaces, in a living lab environment.

3. Content requirements (primary enduser)

3.1 Theoretical background serious games and changing health-related behavior

The term “serious game” was first introduced by the respectively titled monograph of Abt (1970). Though he did not yet refer to digital applications. Nevertheless his explanations are still crucial for today`s understanding when he states:

“Reduced to its formal essence, a game is an activity among two or more independent decision makers seeking to achieve their objectives in some limiting context. A more conventional definition would say that a game is a context with rules among adversaries trying to win objectives. We are concerned with serious games in the sense that these games have an explicit and carefully thought-out educational purpose and are not intended to be played primarily of amusement.” (Abt 1970)

Sostmann et al. (2010) are using a slightly different definition. They understand serious games as software for amusement and didactic simulations. Core difference to games for sole amusement and entertainment is the author`s explicitly defined educational target (Sostmann et al. 2010: 3). The main difference of serious games compared to conventional computer assisted gaming is therefore in their objectives. While the latter primarily or exclusively aim for entertainment, serious games have their prime objective in education, while entertaining is optionally used as a support.

Today, serious games can be found in various areas: health prevention and promotion or rehabilitation, but also in staff recruiting and in military contexts. In this contribution the focus is laid on health-related games - or so called “exergames”.

Originally, serious games were used in the educational sector, game controlling then extended the areas of implementation. The “Dance Dance Revolution” game for example utilizes a foot map

for input commands. The player sees arrows on the screen he has to meet in time with his feet. This game was highly successful in Asia and US, and it became a mighty spin off for various physical exergames. Despite the fact that this game cannot be called a serious game, it yet quite obviously stimulates physical exercising. This is substantiated in an American study by Tan et al. (2002) though these authors stress that health promotion can be obtained only via excessive gaming (three times for 44 minutes or four times for 29 minutes per week).

At the latest in 2006 exergames experienced a boom when movement control was introduced with various video game consoles. Multiple games were marketed with the objective to support specific physical moving and general physical training. With this technical development it became possible, to train more than one body compartment at the same time. Many studies published since then have documented the positive effect of serious games for health (Mhurchu et al. 2008, Wittmann 2010, Anderson-Hanley et al. 2012).

Meanwhile serious games are also increasingly utilized in supply chains for tertiary risk prevention and rehabilitation (Martin et al. 2011). Key area for exergames reported in the literature are linked to stroke rehabilitation and prophylaxis of falling down for other reasons (Burke et al. 2009, Lloyd-Jones et al 2010). Characteristic features of exergames for tumbling prophylaxis are as follows. As explained above, various physiological (including the physical) functions are changing with age. This development leads to increased risks of tumbling. Severity of falling tends to be downgraded by those affected and for this reason medical treatment comes too late or not at all. Strategies to avoid falls have become a key topic in the prevention of permanent or long

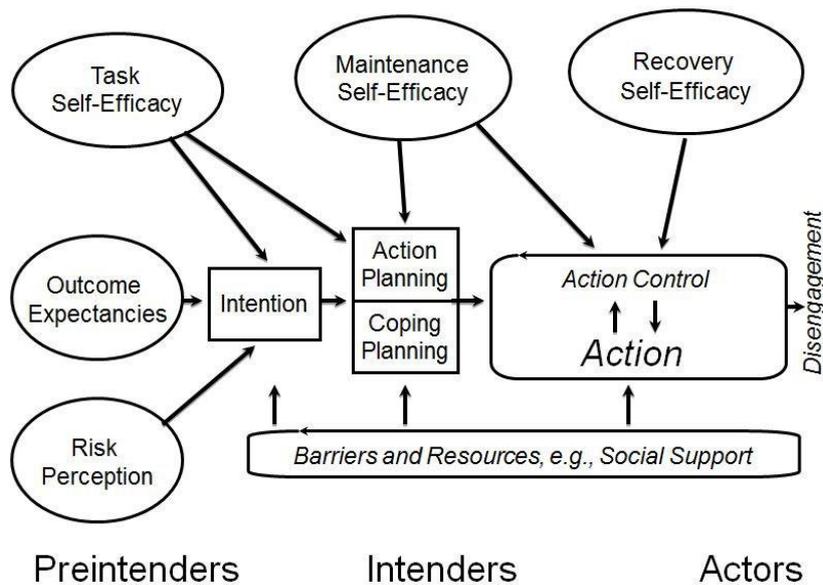
duration immobility of elderlies. The majority of falls of elderlies is linked to an impaired musculoskeletal system. Falls are often caused by minor stumbling blocks in unknown as well as known living environments, due to awareness focusing on other aspects than movement only. Thus preventive measures must go beyond the exclusion of such stumbling blocks. Barrier free environments are nothing more than a positive basic condition. However, preventive measures must focus on the body functions controlling safety. Depending on the grade of functional reductions primary, secondary and tertiary preventive measures can be applied.

In principle one has to differentiate between two approaches: 1) Serious games offering preventive measures and exercises targeting the secondary health supply market; 2) utilization of training software within the framework of classical health service by physicians, physical and ergo therapists. Various investigations have documented the effectiveness of serious games applications in tumbling prophylaxis. However, long duration studies are still missing (Wiemeyer 2010).

A new boom for serious games in the health sector can be foreseen for the near future, especially as links to social networks have been eased this way. Furthermore, with the introduction of smartphones and tablet-PCs, end users are no longer restricted to expensive complementing devices for route documentation. Smartphones can make use of GPS-signaling and thus function as virtual diaries of activity. This scenario is still at its very beginning and it must be awaited to which extend it is utilized by serious games developers and end users.

The outcome of serious games can best be visualized with the help of a socio-cognitive model on the formation of different phases in health behavior (HAPA).

Figure 13: The social-cognitive model of health (HAPA)



Source: Schwarzer 2004

According to this model, people go through a process of decisions at the end of which an aim is set for behavioral change. This process phase is characterized by different cognitional features.

- Awareness of risk reflects the subjective assessment of person's jeopardy through specific diseases and endangerments.
- Expectation of outcome can be described as a process of assessing the advantages and disadvantages of intervention.
- Expectation on self-effectiveness refers to the individual judgment of competences to meet the objectives of intervention.

The setting of aims is equivalent to the end of the motivation phase and the individual changes from a non-intender to an indenter. During the consecutive volitional phase plans are fine-tuned. Self-efficacy expectation is of high influence on this phase. As a follow-up to this phase, plans are implemented into praxis and the individual becomes an active player. Assurance of sustain health behavior implementation requires the inclusion of social

resources utilization and the overcoming of barriers. Otherwise the new health behavior becomes interrupted and will cease (postactional objective separation, disengagement). Throughout the entire process and at all times “self-efficacy expectation” (SEE) is of major influence on the outcome (Lippke & Renneberg 2006). Thus SEE is considered with special emphasis for health prevention and promotion and it is indeed of key importance for physical activity at advanced age (McAules et al. 2007, Leonhardt & Laekeman 2010). Schwarzer (2004) describe SEE as the personal certainty to appropriately meet new and difficult challenges on the basis of own competence. Consequently SEE can be used synonymously to subjective competence expectation.

Terminology has originated from the social-cognitive theory of Bandura (2001). According to this theory all actions emerge from the two subjective convictions or credos: consequence and competence expectation. Expectation of consequence relies upon factually and formally required behavioral performance in an universal context, without which an envisaged outcome cannot be reached. In contrast, expectation of competence refers to the individually determined contribution of a person. This credo can be named also as SEE and is not an inborn feature. Rather SEE is shaped by mutually active influences between any individual and its respective life environment(s). Crucial biographic experiences, as for example the mastering of exceptional challenges or the feedback on own behavior and performances can become a positive key influence for SEE. On the other side, a lack in sufficient challenge and frustration can negatively impact SEE (Winkel et al. 2006).

Serious games can become effective during different phases of the HAPA model. During the motivational phase educational and

formation characteristics are most influential. Targeted information with the backing of a gaming software context can positively enhance risk awareness, outcome expectation and self-efficacy. Positive motivation is crucial for successful behavioral change. Thus it is here where serious games have a good chance of influencing traditionally difficult to approach social groups for social participation, health prevention and promotion. During the planning phase one can stipulate a positive outcome of serious games by the provision of individualized training schedules. However, most effective for resource mobilization and barrier reduction are serious games during the active phase of gaming. When behavioral change is considered, the software of the game should be capable of evaluating newly set aims and objectives are realistic or should be modified. During the gaming phase the software should positively influence motivation for example via positive comments, encouragements to go on, bonus awarding for successful performances and respective conclusive rating after the training sessions enhanced communication features among the players. This way SEE can be shaped best.



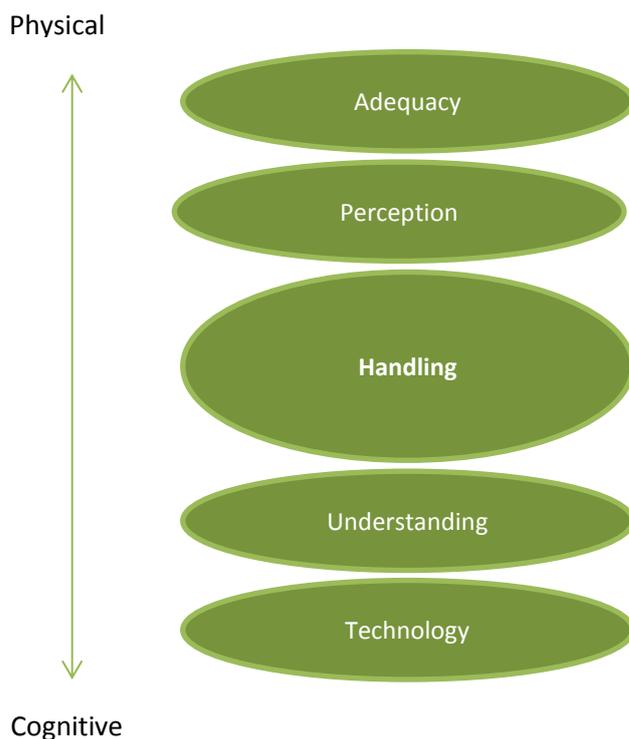
In a nutshell...

- “Serious Games“ are tools which in the first instance do not focus on entertainment but primarily aim for formation. Yet, entertaining values are not excluded, often even utilized in support of educational improvement.
- Recent developments and innovations in video game consoles, PCs and Smartphones have opened the areas of health prevention and health promotion to serious games application. However, solid evidence is missing on sustainable benefits for these sectors.
- Up to now, serious games aims have mainly addressed younger people. With the growing exposure to technologies plus respective increments in acceptance and mastership amongst seniors, this societal group becomes more and more relevant for serious games developer.
- This communication explains characteristics, aims and structure of the MobilityMotivator (MoMo) project in the context of serious games developments.
- During the planning phase one can stipulate a positive outcome of serious games by the provision of individualized training schedules.
- During the gaming phase the software should positively influence motivation for example via positive comments, encouragements to go on, bonus awarding for successful performances and respective conclusive rating after the training sessions.

3.2 The target population of MobilityMotivator

Age-related stereotypes still exist, especially when it comes to technology. Despite the fact that succeeding generations are more and more used to technology, for the elderly of today this is not the regular case (Initiative D21 2013). Elderly persons are a heterogeneous group, e.g. according to wealth, education or health status. This makes it difficult to identify or exclude typical features. Ageing is accompanied by a number of functional modifications – reductions but also improvements. Without a careful general and individualized analysis, outcomes can be missed or even reversed into the opposite.

Figure 14: Demands to be met by SG developers when seniors are target group for technical solution offers



Source: Modification of a diagram published by Kirchmair (2005)

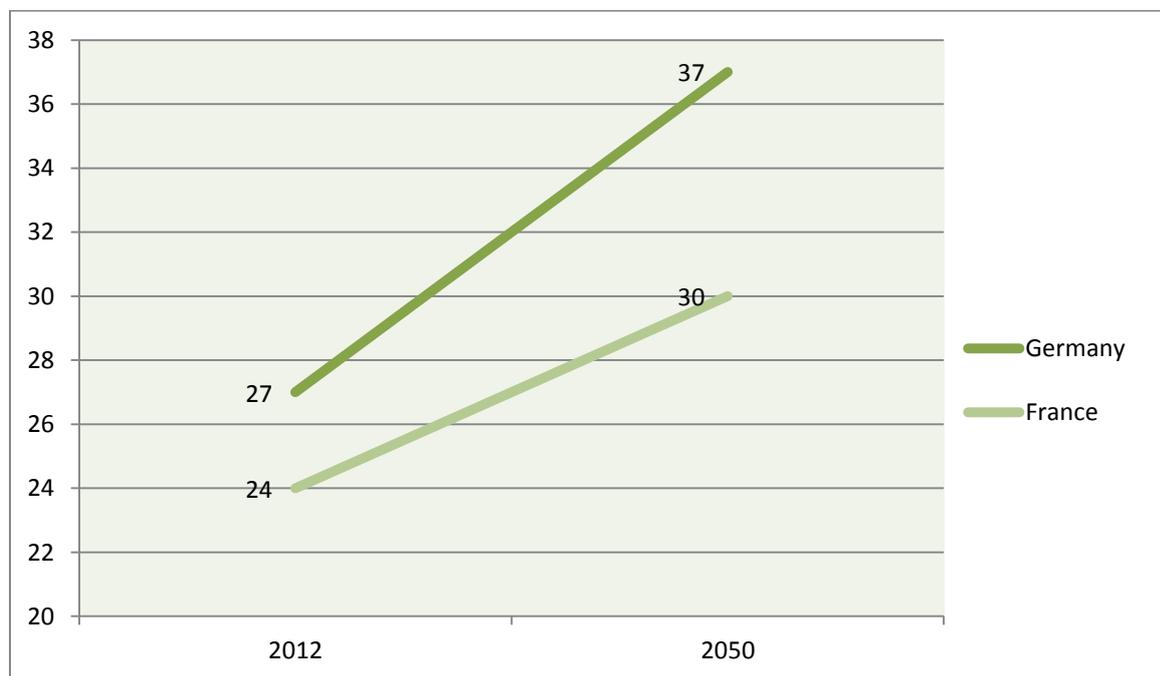
There are a couple of typical aspects which easily can be included into the development of software-based solution targeting elderly users. For instance, this includes adjustable font

sizes. A basic problem seems to be the design “as a whole”: If older persons perceive a product as mainly designed for younger persons, this will negatively influence the decision to adopt the technology.

A few years back, developers were primarily focusing on usability and ease of handling, while motivational and target group specific aspects were largely neglected (Ijsselsteijn 2007). Within recent years more target group specific developments have received growing attention (Väätänen & Leikas 2009).

The project focuses mainly on older persons. Taking a look at the population development in Germany and France, it can be seen that the potential target group will increase during the next years.

Figure 15: Population Development 2012 – 2050, Proportion 60+ of total population, Comparing Germany and France (in percent)



Source: UN 2012

It has to be recognized that both, in Germany and France, the proportion of older people will increase. In Germany today, every 4th person is aged 60 years and older. In 2050 the proportion will

rise up to 37%. In France the deferral slightens a bit: The proportion of older people in the same time span rises up from 24% to 30%.

With respect to potential customers, the development of absolute numbers is more important. In both countries the number of older people will raise from 2012 to 2050:

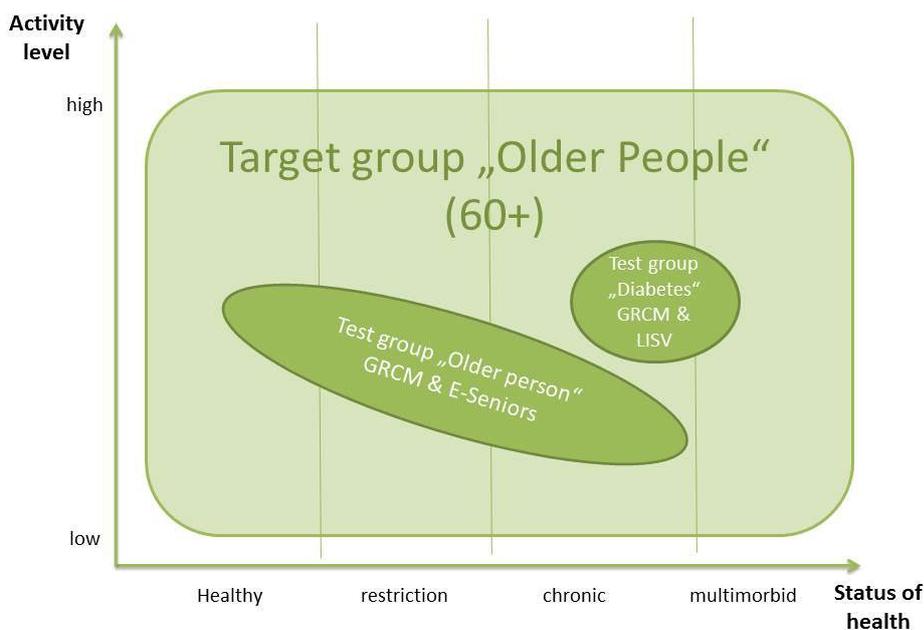
Figure 16: Population development 60+, Comparing Germany and France (thousands)

	2012	2050
Germany	21.866	28.037
France	15.036	22.067

Source: UN, 2012

An exact localization of the targeted group takes place on the basis of parameters “activity level” and “health status”.

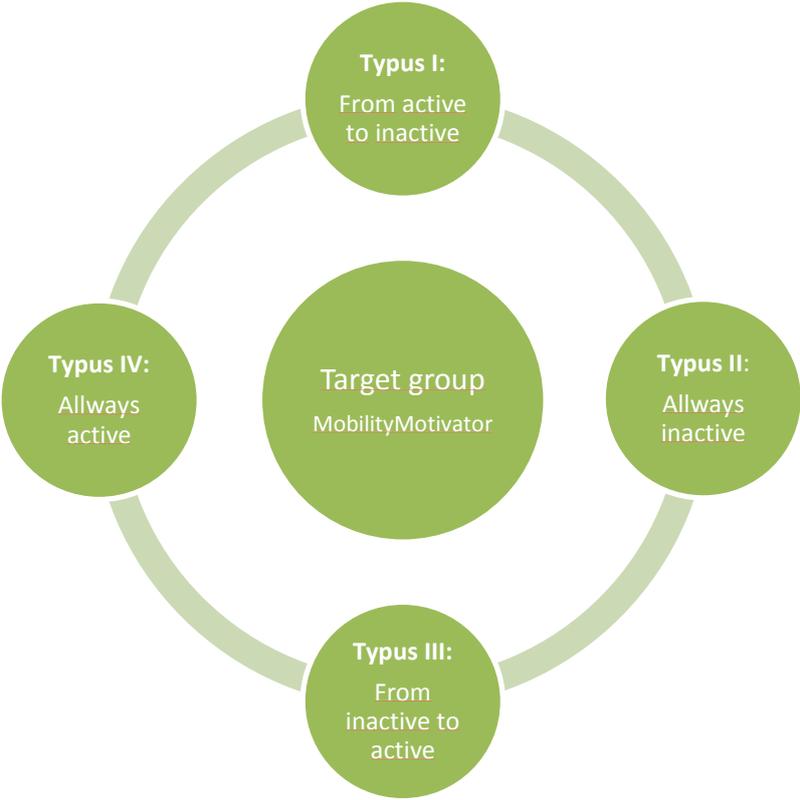
Figure 17: Target group of MobilityMotivator



Source: IAT 2014

The target group of older people is coined in several ways due to heterogeneity: Figure 17 clarifies this through the criteria „activity level“ and „status of health“. Though the predominant part of the older people of today ages in a more healthy way, age related functional restrictions cannot be denied. The shape of these restrictions has effects on the status of health as well as on the activity level. To cover this heterogeneity, different user types were constructed based on the results of the survey. Considering the mobility, the respondents were asked to rate their activity level during their childhood, while growing up, during their middle age and today. Conducting a cluster analysis, four different types could be identified:

Figure 18: Self-rated lifecourse activity typus



Source: IAT 2014

- **Type I – “From active to inactive”**: This type shows high level of activity during the childhood and the adolescent age. With increasing age, his activity level continuously reduces.
- **Type II – “Always inactive”**: Type II avoided activity during the whole life and describes himself as inactive.
- **Type III – “From inactive to active”**: This type can be seen as the opposite of type I. While being rather inactive during the childhood and the adolescence, the activity level of has increased since then.
- **Type IV “Always active”**: As the name suggests, this type has always been active.

Figure 19 shows that a significant relationship between the activity type and the quality of life can be found. The WHO QoL scale was integrated in the questionnaire to measure the quality of life.

Figure 19: Activity Types in context of Quality of Life

Typus	WHO QoL		SD
	Mean	Median	
From active to inactive	29,60	31,00	5,297
Always inactive	31,35	32,00	3,900
From inactive to active	33,77	34,00	3,708
Always active	33,22	34,00	3,531

Source: IAT 2014

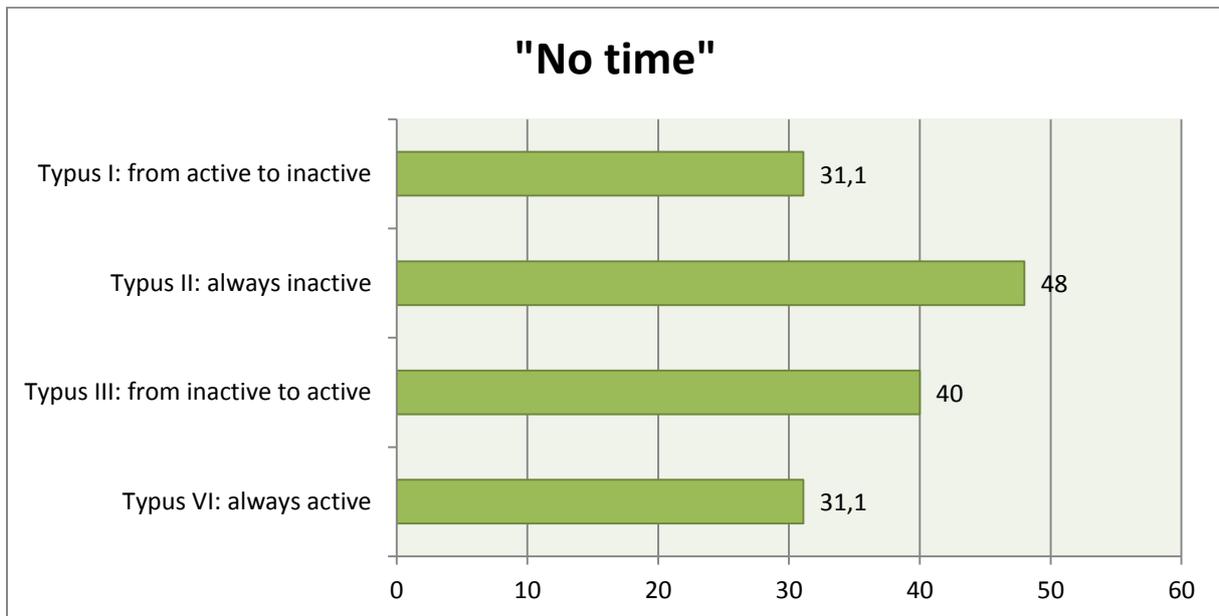
3.3 Content requirement “Motivation”

In the paper-based version of the questionnaire we asked the participants to name reasons which negatively affect their activities. This question was analyzed with the help of a content analysis, leading to four categories:

- No Time

- Age related functional restrictions
- No interest
- No environment

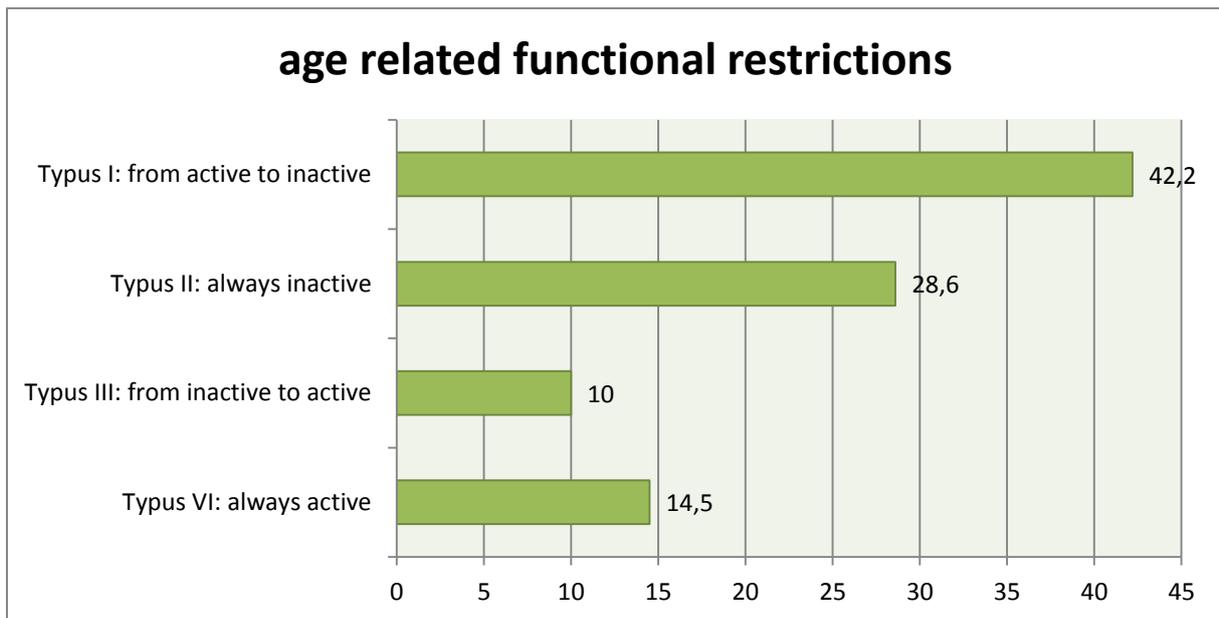
Figure 20: Reasons for inactivity I (n=501) (in percent)



Source: IAT 2014

Type I, II and III name “no time” as a reason for their inactivity. But also other duties were mentioned (work, honorary office, taking care of the grandchildren). Interestingly, the percentage of type II is remarkable high with almost 50%. Further research is necessary to investigate this result. Concerning the development of the game, this means that tasks should be implemented that can be managed in relatively short amount of time.

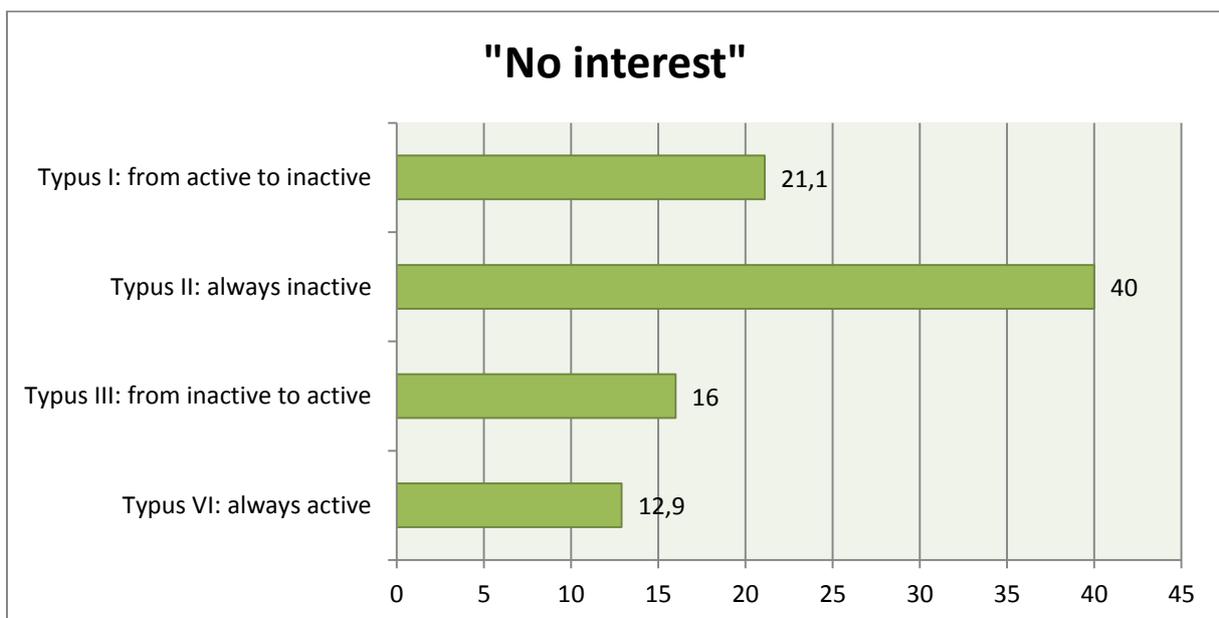
Figure 21: Reasons for inactivity II (n=501) (in percent)



Source: IAT 2014

Clear differences in the arrangement turn out here, too. Noticeably high is the percentage of people belonging to type I. The tasks and scenarios in the software must be coercible adjusted on the physical condition.

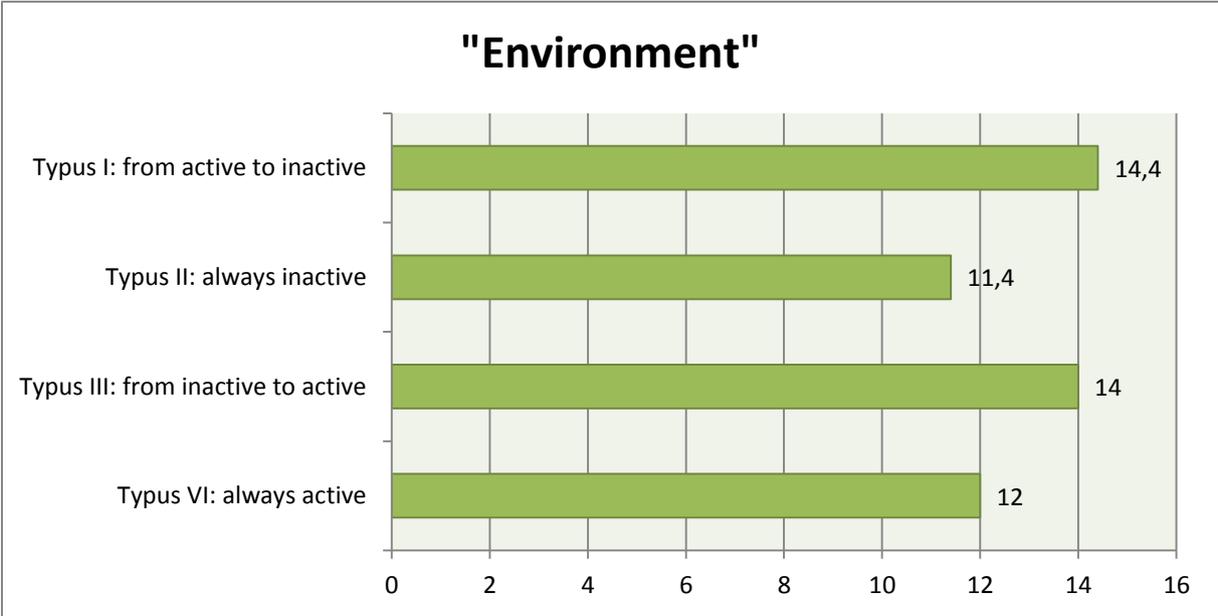
Figure 22: Reasons for inactivity III (n=501) (in percent)



Source: IAT 2014

Especially type II seems to be less motivated to perform physical activities. Here too, further research needs to be done to gain more insights. On the basis of the HAPA model (see figure 13) type II can be seen as the main challenge for the project.

Figure 23: Reasons for inactivity IV (n=501) (in percent)



Source: IAT 2014

The physical, spatial and technical environment greatly affects the activity level of older persons. It could be a goal of the software to inform about activity opportunities inside and outside the own apartment.

Reasons motivating older persons to leave their home environment apart from regular shopping were to meet other people, usually family or friends, with cinemas or restaurants being the most popular venue choice. According to the French focus groups, public transport using the bus or metro and walking are the most frequent means of mobility for clients in Paris or the near suburbs. The main problem mentioned was the fear of falling and in this respect, bad driving by bus drivers was mentioned as a problem, despite the introduction of dedicated bus lanes and driver training. Too many stairs to negotiate in the metro was another

problem. Even when escalators exist in the metro, the edge of the tread is practically invisible, particularly for those going down. This is particularly a problem when the escalator is out of action because the height of the steps is also greater than for normal stairs, but could be alleviated by introducing a colour contrast band at the edge of each step. A number of their clients use a walking stick, but very few use a walker.



In a nutshell...

- Despite the heterogeneity of the group of older people there can be identified four different activity types:
 - From active to inactive;
 - Always inactive;
 - From inactive to active;
 - Always active.
- Typical barriers for being not active are “Not time”, “Age related functional restrictions”, “No interest” and “No environment”.
- The content of the game should focus on the barriers.
- To identify the different needs of the activity types a further detailed analysis is necessary.

3.4 Results from the focus groups – content requirement

Unsurprisingly, the predominant part of older people has no experience with video games. It can be recognized that there is a negative fundamental tendency about this subject, which is established by negative media reporting and observations in the familiar environment:

„My grandchild is sitting at the computer the whole day“.

But it becomes clearly apparent that these arguments are shaped by prejudices and information deficits. During the discussion it turns out, that there are certain aspects raising interest among the participants. For instance, cognitive exercises like Sudoku, crossword puzzles or quiz games do not have to be paper-based but could also be software-based. There are plenty of proposals for the question how such a game should look like:

- The game must be easy to understand and it *„may not have a manual with thousands of pages“*. It has to be possible to get into the game immediately after a longer break, without having to learn everything again and from the beginning;
- Time restrictions have to be avoided (*„I must have enough time to read everything. When I watch my grandchildren, it all goes so quickly and in this short amount of time, I can't read everything.“*);
- The content of the game must be comprehensible for the target group. This relates especially for quiz games. Here the target group wishes for a kind of content which is interesting for them. (*„When I'm watching Jauch [Moderator of the German version of Who wants to be a millionaire?] and there are questions about cinema movies or pop music, I can't say anything about it.“*). Topics related to history, music of the

50's, travelling, geography or sports appeal more to the targeted group.

- Competition could play a motivating role. But in this case, there must be found a proper and fair way not to disadvantage people with handicaps.
- The content of the game and the user interface should have direct links to the environment the people live in. When asked where they spend their free time, following answers were made: Theatre, Café, Nature, Museum. The results from the focused groups correspond with the results of the written poll.
- It is not clear, if a computer animated avatar effects the adoption decision positively or negatively. To get a valid statement for this case, a praxis test is recommended.
- Some games popular with seniors that were mentioned were scrabble, patience and among TV programs, after prompting treasure hunt. The use of an environment such as that proposed by Studio 352 for groups could be interesting in this setting. Nevertheless this type of game is an example of pursuits that reduce physical activity and constitute an incompatibility with the concept of outdoor mobility. It is noted, however, that no medical or paramedical staff are involved in this organisation and no clients have been sent to these sessions either by their general practitioner or by a hospital;
- The introduction of the basic principle of the MobilityMotivator is rated quite positive by the interviewees. However, it is shown that they can't imagine something like a „GPS-tracking“. Here a praxis test is recommended, too. Further, the interviewees wished not to play alone, but in a challenge with different groups.

- The implementation of telemedical components was seen skeptical at first. During the process it turns out, that this skepticism is primarily caused by information deficits. The initial strict refusal („*Telemedicine has to be prohibited!*“) is reduced during the conversation. A big part of the interviewees sees the chance of more security in daily life with a video conference system („*If I have the chance not to call for an emergency doctor first, but have the chance to clear something up, it is a good thing.*“);
- The question, who should pay for solutions, is contrary discussed. The interviewees agree that people with adequate earnings shall pay it themselves. But there has to be the chance to find other funding strategies.

In the subsequent praxis test, the interviewees were asked to test easy games on different hardware components. In this test it turned out, that a 5“ display of a smartphone is too small to play certain games (Labyrinth, Angry birds). From a size of 8“, the applications were generally playable for the targeted group. Simple quiz applications (“Who wants to be a millionaire”) were playable for a part of the interviewees even on a 5“ display.

The basic principles of the games were identified by the interviewees (Angry birds, Labyrinth). Control elements were handled quickly after a short training. The play content of some applications were however contrary discussed („*Why should I shoot with birds on boxes?*“ – „*But it is fun, too*“)



In a nutshell...

- Older persons are not very familiar with videogames.
- A well-known place, where seniors spend their leisure time (Café, Museum) could be used to build the design of the interface.
- Adaption from well-known games, which older people usually like to play (Quiz games, boardgames like scrabble or ludo) could be integrated.
- The rules of the games must be very simple.

4. Evaluation of secondary end users' requirements

Two studies were conducted to evaluate the secondary end users' requirements. The first one is a contextual inquiry with health care professionals at their work place. The second one is a focus group with medical experts.

4.1 Study 1: Contextual inquiry

4.1.1 Method

In order to gather information on how health care professionals do motivate elderly people today a contextual inquiry has been conducted. The method is introduced in the deliverable "User Consultation Protocol and Tools" and is explained more in detail in literature (Beyer & Holtzblatt, 1997).

4.1.2 Population

The health care professionals were recruited in the division of internal medicine and rehabilitation at the Geneva University Hospital. Some of the recruited participants also work in the division of geriatrics at the same hospital. Our inclusion criteria were that they have at least one year of work experience and that they are fluent in the French language. In the following table the 7 health care professionals that were interviewed are listed.

Code	Function	Years work experience
AP1	Attending physician Division of geriatric medicine	7
HD1	Head physician Division of internal medicine and rehabilitation	20
AP2	Attending physician Division of geriatric medicine	8
PT1	Physiotherapist Division of physiotherapy	30
ET1	Ergo therapist Division of internal medicine and rehabilitation	12
NU1	Nurse Division of internal medicine and rehabilitation	23
NA1	Nursing auxiliary Division of internal medicine and rehabilitation	11

4.1.3 Procedure

First, participants received a consent form where they agreed that the data gathered during the interview can be used for publication once it is made anonymous.

Second, the participants were asked about how many years of work experience they have as health care professionals. For physicians we defined the year of reception of their university diploma as the start of work experience.

Third, we introduced the core questions of the Mobility Project to the participants which are:

- How to measure and monitor physical and cognitive abilities?
- How to encourage patients to do more physical activities?

- How to encourage patients to go outside and use public facilities to meet other people?

The interview was semi-directive and the questions were adapted to the profession and specialty of the interviewed person. The interviewed person was invited to talk about his/her experiences made in relation with the questions stated above.

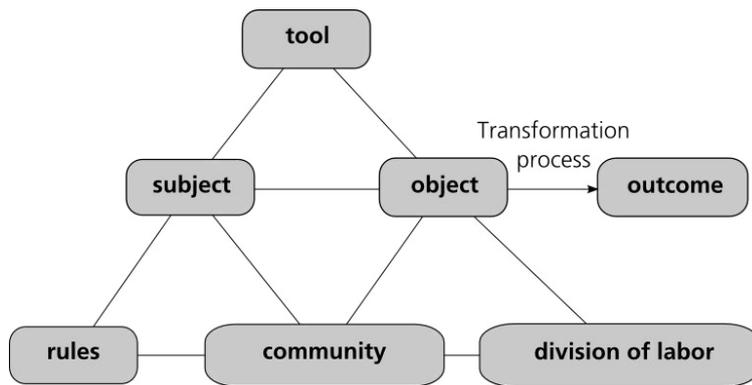
All interviews were voice recorded. In some cases photos of artifacts were taken that the health care professionals used in their work.

4.1.4 Results

In order to perform a content analysis of the transcribed interviews we used the activity model of Kuuti (1996). The model can be used to describe activities in a professional setting. The activity we are interested in is the encouragement of elderly people to do more physical, cognitive, and social activities. In Fig.1 we can see the different elements of an activity. There is:

- the subject of the activity which is the interviewed health care professional;
- the object of the activity which is the elderly patient;
- the outcome of the activity is a patient who does more physical, cognitive, and social activities. The outcome is also the goal of the activity;
- the tools that are used to achieve the outcome;
- the rules that have to be respected to achieve the desired outcome;
- the community the subject and the object belong to;
- the division of labor that is necessary to achieve the desired outcome.

Figure 24: Activity diagram adapted from Kuuti (1996)



Source: Kuuti 1996

We use 6 elements (without outcome) in our context analysis of the interviews and match statements made by the interviewed persons to them. In the following are 144 statements made by the interviewed health care professionals that were selected based on their pertinence for our research question.

In the transcriptions following syntax conventions are used:

- « » a quotation
- [?] a term that was not understood or not clear whether correctly translated
- ... some statements were cut out because they were not relevant
- [] comment by author to make the context of the statement clear

Subject

	Participant	French statement	Translated English statement
1	AP1	« ce serait intéressant à voir si globalement le travail qu'on fait ici fait un sens » [un retour sur le progrès du patient]	« It would be interesting to see if the work we do here make sense » [a feedback on the patient's progress].
2	AP1	[les ergothérapeutes] « ils font des visites à domicile »	[the ergotherapists] « they do home visits »
3	CC1	« On [médecins] évalue leur capacité et leur besoin en terme de réadaptation »	« We [physicians] evaluate their capacities and needs relation to readaptation »
4	CC1	« ...on [médecins] n'est pas toujours les meilleures prescripteurs de physiothérapie.	« we [physicians] are not always the best prescribers of physiotherapy. We don't have a

		On n'a pas une formation très adaptée en médecine. »	training that is very adapted in medicine. »
5	AP2	« Nous, on ne fait pas tellement le suivi cognitif, on fait surtout le diagnostic et la planification... On fait peu d'action de prévention et peu d'action de renforcement »	« We don't really provide care for cognitive aspects, we do mainly diagnostics and planification... We rarely do prevention or reinforcement. »
6	AP2	« Les ergothérapeutes sont impliqués soit dans, je vois surtout 3 aspects, soit pour pallier une déficience d'un patient avec un outil auxiliaire matériel, soit adapter le milieu hospitalier au patient, soit faire une visite à domicile avec le patient pour améliorer son milieu de vie pour minimiser le risque de chute, ou tester les performances dans son milieu. »	« The ergotherapists are implicated in, I see 3 main aspects, either to palliate a patient's deficiency with a support tool, or by adapting the hospital environment to the patient, or by visiting the home together with the patient in order to improve his living environment and to reduce the risks of falling, or testing performance in the living context.»
7	PT1	[à la question s'il propose des exercices à faire à la maison quand les patients ont quitté l'hôpital.] «Je ne suis pas très enclin à continuer de les dire il faut continuer une thérapie parce que je me suis rendu compte avec les années. Même si on leur donne des exercices ils vont pas les réaliser à domicile. En général ils reprennent leurs habitudes... »	[replying to the question whether he propose to patients to do exercises once they have returned at home] « I do not really tend to continue to say that they should continue a therapy because I became aware after those many years: even if you give them exercises, they wont do them at home. In general, they fall back into their habits. »
8	ET1	« C'est qu'on fait en ergothérapie. On utilise l'activité comme support thérapeutique. L'activité en sens large. Ça peut être des activités analytiques, de déplacer des pions pour entrainer la mobilité des membres supérieures, la prévention... ou des activités créatives ou artisanales... De pouvoir prendre plaisir à faire quelque chose. »	«That is what we do in ergotherapy. We use activities as additional therapy. Activities in a broad sense. It can be analytical activities, moving a piece in order to train the mobility of the upper limbs, prevention... or creative activities or manual activities... Finding pleasure in doing something.»
9	ET1	« Ce qu'on utilise beaucoup ici... c'est les mises en situation du quotidien. On va essayer de replacer des patients dans des situations les plus proches possibles de leur réalité de vie à domicile. Et de voir comment ça ce passe au niveau cognitif et physique. »	«What we use a lot here... is the simulation of everyday situations. We try to place the patient in a situation that is the closest possible to the living situation found at home. We want to see how the patient is doing at a cognitive and physical level.»
10	ET1	« Il y a une partie de traitement qui se passe dans la salle d'ergothérapie. On est amené à aller au domicile du patient pour	«A part of the therapy takes place in the ergotherapy room. We have to visit the patient's home in order to do a transposition of what

		faire la transposition de ce qui a été fait en rééducation dans leur milieu et de voir si effectivement un transfert de compétence qui se peut faire de ce qui est appris à l'hôpital et dans leur domicile. »	has been done in reeducation to their environment; and to see a possible transfer of trained abilities in the hospital and in their homes.»
11	ET1	« Des activités artisanales et créatives, c'est des activités qu'on essaie de mettre en place à la demande. C'est surtout pour des patients qui ont des problèmes de dépression, ..., pour que le patient retrouve le self esteem. »	«Manual and creative activities are activities that we organize on demand. In particular they are meant for patients that are depressive ... so that the patient regains self esteem.»
12	ET1	« C'est vrai qu'on a pas la possibilité d'interagir avec des personnes qui sont sortis de l'hôpital... on les revoit par la suite parce que les rehospitalisations sont assez fréquentes... On transmet la situation à d'autres... le réseau de soins à domicile, l'IMAD. Après au niveau d'ergothérapie c'est souvent l'IMAD. C'est le seul service de soins qui a des ergothérapeutes. »	«Indeed we have no means to interact with patients that have left the hospital... we meet them again when there is a rehospitalization that is quite frequent. We communicate the situation to others... the home care network, IMAD. When talking about ergotherapy it is often IMAD. This is the only care unit that has ergotherapists.»
13	NU1	« Le piège pour les soignants, parce qu'on a toujours peur qu'il retombe [?] nous les soignants on dit : attention, attention ! ça peut freiner la motivation du patient. »	«The pitfall for care takers... because we are always worried that they fall again [?]. We care takers say: be careful, be careful! This might have a negative impact on the patient's motivation.»
14	NU1	[suite à la question si les patients prennent l'initiative de bouger] « C'est plutôt nous qui proposons. Les gens sont fatigués quand ils arrivent ici. »	[responding to the question whether patients take the initiative for doing physical exercises] «It is rather us that suggest something. The people here are tired when they arrive here.»
15	NU1	« On essaie de mettre en valeur les propres ressources à lui [le patient] mais aussi s'il a un entourage familial ou amical. On les mets en coordination avec le projet de vie du patient. »	«We try to emphasize his/her own potential [patient] but also the potential of family members or friends. We align them on the patient's future plans.»
16	CC1	« On évalue leur capacité et leur besoin en terme de réadaptation »	« We evaluate their capacities and needs regarding readaptation »

Object

	Participant	French statement	Translated English statement
17	AP1	« patients qui sont principalement d'âge gériatrique, plus de 65 ans. La	« patients that are of geriatric age, more than 65 years old. Most of them are more than 80 years old. »

		plupart ont plus de 80 ans »	
18	AP1	« la plupart de temps ils ont entre 80 et 90 ans »	« most of them are between 80 and 90 years old »
19	AP1	« qui sont venu ici pour des soins subaigüe ou pour la réhabilitation »	« who came here for sub-acute care or for rehabilitation »
20	AP1	qui ont « soit des troubles de la marche, des chutes à répétition »	Who have « either problems to walk or who do repeatedly fall »
21	AP1	« Qui n'ont pas forcément une grave maladie, qui on simplement un rhume, une grippe, où ça les affaibli très vite et très fortement »	« who do not necessarily have a severe illness, who do simply have a cold or the flu which weakens them very quickly and severely. »
22	CC1	« Les patients qui arrivent ici sont des patients où les deux tiers ou env. 70% sont des urgences »	« The patients who arrive here are emergencies in two thirds or 70% percent of the cases »
23	CC1	« Et ensuite par la motivation propre du patient. Quand il dit qu'il ne veut pas. C'est inverser des cas des décennies de vie. Un sujet obèse, il a des habitudes alimentaires. C'est dur à inverser. Un sujet qui ne veut pas se motiver de faire quelque chose à 80 ans ça va être dur à inverser. »	« Then there is the patient's motivation. When he/she says that he/she does not want to. We talk about inverting decades of life. An obese subject, he/she acquired food habits. It's difficult to inverse. Somebody who did not want to motivate himself/herself doing something at the age of 80. It will be difficult to inverse.»
24	CC1	« Si le patient bloque, il bloque. »	« When the patient refuses, he/she refuses. »
25	CC1	« On a quand même 50 % des patients qui ont un trouble cognitif et on a 20 % qui sont des vrais déments. »	« 50% of patients have a cognitive dysfunction and 20 % are really demented. »
26	AP2	[Les patients souffre de] « Fracture, infection bactériales, dénutrition, troubles cognitifs »	[Patients suffer from] « Fractures, bacteriological infections, denutrition, cognitifs dysfunctions »
27	AP2	« Il n'y a pas seulement des problèmes de la marche... Il y a des problèmes médicaux, psychologiques et sociaux. »	«There are not only problems concerning walking. There are medical, psychological, and social problems.»
28	AP2	« La plupart de mes patients sont dans un état de démotivation. Ils ont mal parce qu'ils se sont très fatigués après un événement médical aigu. Ils se sentent isolé. Ils sont sortis de leur mode de leur vie standard. »	«Most of the patients are in a state of despair. They are not doing well as they are very tired after a severe medical intervention. They feel isolated. They are taken out of their normal life situation. »
29	PT1	« Le moyen d'âge est autour de 85 ans. »	«The mean age is around 85 years.»
30	PT1	« Essentiellement des patients chuteurs avec fracture ou non qui étaient opérés. »	«Essentially patients who fell, with fractures or not who underwent a surgical intervention.»
31	PT1	« ... cas de neurologie avec un cas de suite d'un accident vasculaire cérébral récent. Des	« ... neurological cases after a recent cerebral hemorrhage. Sometimes patients, less frequently,

		fois des patients, plus rarement, avec des problèmes cardio-respiratoires. »	with cardio respiratory problems. »
32	PT1	« ... en général à tout l'hôpital, ce sont des patients, des pathologies qu'on retrouve avec des problèmes avec les membres inférieures. Donc, on sent la diminution de la mobilité chez ces gens là, lié à des facteurs sociaux, cognitifs, physique. »	« ... in general, in the whole hospital, there are patients, pathologies where they have problems with the lower limbs. We notice a diminution of the mobility among those people. They are linked to social, cognitive, and physical factors. »
33	PT1	« On est sur une population genevoise qui est quand même relativement sédentaire comparé avec une population dans le Valais ou d'autres cantons suisses. »	« Nevertheless, we are a Geneva population that is quite sedentary compared with the population in other Swiss cantons. »
34	PT1	« Il y a beaucoup qui préfèrent l'isolement. » [en contraste de faire des activités en groupe]	«Some prefer solitude» [in contrast to do activities in group]
35	ET1	« J'ai comme particularité des personnes présentant des troubles de comportement de type déambulation et violence. Sinon c'est une population âgée disant tout venant. »	«In my case I have in particular persons that have behavioral dysfunctions, for example roaming [noctambulism ?] and violence. Otherwise it is a general population of elderly people.»
36	ET1	[Suite à la question quelle sorte de technologies les patients ont chez soi.] « Je suis assez étonné de voir des nouvelles technologies : télévision, home cinéma, ordinateur. C'est des choses qu'on trouve assez souvent à domicile. Tous ce qui est mobile, c'est encore compliqué. [?] la facilité d'utilisation, un Natel [telephone portable] simple ce n'est pas forcément évident pour une personne âgée. C'est vrai ce qu'on trouve c'est le Natel à grande touche, ou des Natels qui datent il y a quelques années en arrière un peu volumineux encore. On n'est pas encore passé au tablet ou le smart phone. »	[Responding to the question what kind of technologies patients have at home] «I am quite surprised to see new technologies: television, home cinema, computers. Those are devices that we see often at home. Everything that is mobile is still complicated. [?], the usability, a simple Natel [cell phone] is not necessarily easy to understand for an elderly person. We find Natels with large buttons, or Natels that are already some years old and that are quite bulky. We have not yet seen a change to tables or smart phones.»
37	NU1	« C'est vrai que l'âge d'arrivé peut être 65 ans mais l'âge moyen est plutôt 80, 90 ans. Et ils arrivent dans une situation de crise... Nous on se laisse déjà le temps pour les connaître, on fait une bonne anamnèse. Selon leur état physique, avec l'équipe pluridisciplinaire, avec	«It is possible that they come at the age of 65 but the mean age is rather 80 or 90. They come in a state of distress... We take the time to get to know them, we do a good anamnesis. Depending on their physical condition, together with a team of ergotherapists, physiotherapists.»

		l'ergo, le physio. »	
38	AN1	« La première prise en charge au niveau de la mobilisation quand ils arrivent c'est déjà de les stabiliser. Une fois qu'ils sont stabilisés, les premiers qui les prennent en charge de l'équipe sont les physios, et nous derrière on prend le relais. C'est déjà marcher, c'est faire des exercices en bas où ils ont un atelier d'exercices. Et nous on continue derrière en les incitant à sortir du lit pour aller à la salle de manger... »	«When taking about mobilization, the initial care that is given is to stabilize them. Once they are stabilized, the first who takes care of the patient are the physiotherapists, and we apply the instructions as intermediaries. First they may walk. They may do exercises downstairs where we have an exercise room. We apply the instructions and we motivate them to leave their bed and to go to the dining room.»
39	AN1	« Quand on vous écoute parler, déjà le fait que ce soit à la maison, que ce soit un jeu interactif, on sait déjà que ce n'est pas la même catégorie des personnes qu'on parle. Ce n'est pas la même catégorie des personnes qu'on a nous. Moi j'ai lu l'article [elle se réfère à l'article publié dans Pulsation, un journal des HUG, qui présente le projet Mobility Motivator]. En partie il faut savoir gérer un smart phone, il faut savoir gérer un ordinateur. »	«When we hear your explications... already that it is used at home, that it is an interactive game, we know already that it is not the same category of people we are talking about. I have read the article [she is referring to an article published in Pulsation, a magazine by HUG wherein the Mobility Motivator project is presented]. For once, they need to know how to use a smart phone and a computer.»
40	NU1	« J'aimerais ajouter que c'est des générations qui ne jouaient pas dans ce sens, même des jeux sur papier. C'est des gens qui travaillaient toute leur vie et je ne pense pas qu'ils accrochent à ce type de challenge. »	«I would like to add that we talk about generations that did not play, not even games on paper. Those are people that worked all their life and I do not think that they would be attracted by such a challenge.»
41	NU1	« On a des gens ici qui ont des portables, mais la gestion elle est difficile parce qu'ils ne savent pas très bien l'utiliser et ils sont en état de crise. »	« We have people here who have cell phones, but the handling is difficult because they do not know very well how to use them and they are in a state of distress.»
42	NU1	« Il y a beaucoup de patients qui sont seuls. »	«There are many patients that are lonely.»
43	NU1	« Ici, des fois ils [les patients] restent 2 ou 3 mois. »	«Here, they [patients] sometimes stay 2 or 3 months.»
44	NU1	« A cause de leur maladie ils n'arrivent pas à faire le numéro. Par exemple on vu un patient avec Parkinson, il tremblait beaucoup. Il n'arrivait pas à faire les numéros, alors que c'était un portable pour séniors... ou visuellement ils ne voient pas bien. Il faut que ce sont des grosses touches. »	«As a consequence of their illness they do not manage to dial a number. For example we have seen a patient suffering from Parkinson. He shook intensively, he did not manage to dial the numbers, even if it was a cell phone for elderly people... or visually, they don't see very well. The telephone needs to have big buttons.»

45	PT1	« Il y a quelques patients qui nous demandent : où est-ce qu'on pourrait s'équiper avec un tel appareil ? » [des machines de physiothérapie].	«There are some patients that asked us: where could I buy such an equipment?» [physiotherapeutical equipment]
46	AN1	« C'est vrai qu'une fois que le patient est sorti de l'hôpital on n'a pas de contact. »	«When the patient left the hospital we have no more contact with him/her.»

Tools

	Participant	French statement	Translated English statement
47	AP1	« il y a souvent la gym dans ces foyers de jours »	«There is often a gym in the day care institutions.»
48	AP1	« Une [mesure d'activité physique] qui est officielle pour toute la maison, pour tout l'hôpital c'est la mesure d'indépendance fonctionnelle, la MIF qui est faite par les infirmières au moment de l'arrivée du patient et au moment de la sortie »	«One [measure of physical activity] that is official for the whole institution, for the whole hospital is the measure of functional independence, the MIF, which is applied by the nurses when the patient is admitted and when he/she leaves the hospital.»
49	AP1	[MIF est mesuré avec] « une échelle avec des points qui va de 17 à 126 »	[MIF is measured] with a scale that goes from 17 to 126.
50	AP1	« physiothérapeutes font un travail très précis sur la mobilité et les risques de chute »	«Physiotherapists do precise work when evaluating the mobility and the risks of falling.»
51	AP1	« ...mais aussi le poids, le BMI, donc c'est dans les choses un peu générales. Ensuite on a plusieurs échelles qu'on fait. On fait le TUG qui est le Time up and go qui est un manœuvre. On demande aux gens de se lever d'une chaise, de faire 5 mètres et de faire un demi retour et de s'asseoir et on fait un calcul combien il les faut. Dans combien de temps ils le font. Ca nous donne une idée de l'équilibre, une idée de la force pour se lever... »	« ... but also the weight, BMI, quite general things. Further we apply several scales. We do the TUG which is the Time Up and Go that is a maneuver. We ask people to stand up from a chair, walk 5 meters and turn back to sit again on the chair. We do the calculation of how much time this takes them. This gives us an idea on their balance, on their strength that they need to stand up...»
52	AP1	« On fait aussi des tests sur l'équilibre. Est-ce qu'il peut garder l'équilibre sur une jambe surélevée. »	«We also do tests on their balance. Do they manage to stand one one leg ?»
53	AP1	« la première motivation qu'on leur donne ici à l'hôpital c'est de rentrer à la maison »	«The primary motivation we give them is the possibility to turn back to their homes.»
54	AP1	Les physiothérapeutes « qui vont aller voir les patients tous les jours pour aller faire les barres parallèles, pour faire du vélo, salle de physiothérapie... »	The physiotherapists « who visit the patients every day, to invite them to do the parallel bars, to use the bicycle, the physiotherapy room... »

55	AP1	« Pour les capacités cognitives, on va dire la mesure basique c'est le MMS, le mini mental state. C'est vraiment la mesure très basique, qui n'est pas parfait, mais ce qu'on utilise généralement en première intention, pour voir si les gens ils ont des troubles de la mémoire ou pas. ... C'est 30 questions.»	« Regarding the cognitive capacities, the basic measure is the MMS, the mini mental state. It is really a basic measure, that is not perfect, but we use it as the primary tool, to test whether the people have memory dysfunctions or not... There are 30 questions. »
56	CC1	« Des outils on n'a pas vraiment » [pour motiver les personnes âgées de faire de l'activité physique à la maison]	« We don't really have tools. » [to motivate elderly people to do more physical activity at home].
57	CC1	« Il faut qu'ils ont le plaisir pour faire quelque chose » [faire plus d'activité physique]	« They have to have fun to do something » [to do more physical activities]
58	CC1	« le fait de dire vous rentrera à la maison si vous faites ce progrès la, c'est des fois une carotte que j'utilise » [pour motiver les personnes âgées à faire plus d'activité physique]	« By saying that they could return to their home when they make progress is sometimes the carrot I use » [to motivate elderly people to do more physical activities]
59	CC1	Une carotte qui rejoint le fouet. Ça veut dire : Si vous montez pas [l'escalier] vous rentrez pas à la maison. Donc, voilà, après le fouet il est limité.	It is a carrot that becomes a whip. For example I would say : If you don't climb [the stairs] you wont return at home. But really, the use of the whip is quite limited.
60	CC1	« C'est à dire si on veut mettre un jeu dans les mains d'un patient et sur 10 patients il y a qu'un qui veut jouer, ça ne sert à rien. S'il y a 9 qui veulent jouer, ou 4 ou 5, c'est gagné. Voilà. S'il y a un truc qu'on peut les faire faire qui les occupent qui les intéresse et qui les motive. Super. »	« I mean when we put a game into the hands of the patients and when 1 out of 10 patients wants to play the game, that would be useless. If however they are 9 that want to play, or 4 or 5, than we have achieved our goal. If we have something that we can give them, that occupies them, that is interesting for them and motivates them. That would be great. »
61	CC1	« Il faut avoir une quantification des résultats ... ça s'est une forme de carotte ou de fouet, c'est à dire on suit les résultats, des critères de suivi qui soient motivants. »	« You need to have a quantification of results... this is a kind of carrot or whip, which means they have a feedback, so that they have some progress indications that are motivating.
62	CC1	[suite à la question ce qu'on peut proposer comme activité simple] « Je pense qu'à nouveau ça dépend du patient, ça peut être de monter des escaliers, c'est des choses je mettrais tout simplement. Ça peut être un test de marche de 6 minutes. C'est une chose que font les physiothérapeutes. On marche une certaine distance. Ça pourrait donner une amélioration	[responding to the question whether he could propose a simple activity] «Again, I think that it depends on the patient, it might be stairs that can be climbed, it should be simple things. It could be a walking test of 6 minutes. It is something the physiotherapists are using. One walks a certain distance. This could lead to an improvement – trying to go further and to set goals.»

		- essayer d'aller plus loin et de donner un cible. »	
63	CC1	[Nous avons] « un tapis de marche qui a des centaines de milliers de capteurs. Et qui enregistre la dynamique de la marche du patient. »	[We have] « a treadmill that has hundred of thousands of sensors. It records the patient's dynamic of walking. »
64	CC1	« nous on est énormément dans la prévention des chutes et l'idée de faire des programmes qui passe par la danse,..., la rythmique, danse de salon, ou le tai chi »	« we are specialized in fall prevention and we have programs that use dancing, rhythmic, ballroom dances, or tai chi. »
65	CC1	« Moi je pense à un entraînement d'haute d'intensité, faire du fitness aux octogénaires. »	« I would like to offer high intensity physical exercises, fitness training for the people at the age between 80 and 90.»
66	AP2	[se réfère au bilan physiothérapeutique CHEOPS] : « Mesures de performance de mobilité chez les personnes âgées à risque de chute. Une évaluation hebdomadaire. »	[referring to the analysis physiotherapeutic CHEOPS] : « measure of mobility performance in the elderly that have a risk of falling. It is a weekly evaluation.»
67	AP2	[se réfère à MIF] « C'est une prescription... pour une évaluation transversale. »	[referring to the MIF] «It is a prescription.. a transversal evaluation.»
68	AP2	[se réfère à Short Physical Performance Battery] « C'est pareil, dans le protocole CHEOPS se réunissent plusieurs épreuves standardisés qui sont « time up and go », le test de Tinetti, le short physical performance battery qui chacune mesure un aspect différent de la motricité. Ca peut être une mesure globale, ça peut être juste l'équilibre, ça peut être la force motrice des membres inférieures, ou l'équilibre dynamique. »	[referring to the Short Physical Performance Battery] «It is the same, in the CHEOPS protocol you find many standardized tests that are the "Time up and go", the Tinetti test, the short physical performance battery, each of them measures a different aspect of motor activity. This may be a global measure, it might just be a measure of balance, this may be the force of the lower limbs, or the dynamic balance.»
69	AP2	[se réfère à Short Physical Performance Battery] «C'est le physiothérapeute qui fait ces examens.»	[referring to the Short Physical Performance Battery]: «It is the physiotherapist who does the test.»
70	AP2	[se réfère à Short Physical Performance Battery] «ça me permet de dépister les sujets à risque de chute de manière précise. Cela me permet de cibler la thérapeutique qu'on va faire en terme de rééducation... Cela nous permet faire suivre l'efficacité ou le non-efficacité de nos mesures.»	[referring to the Short Physical Performance Battery] «It enables me to identify precisely whether the subject has a falling risk. It enables us to select the reeducation therapy that we will perform... It enables us to follow up the measures' efficacy or non efficacy.»
71	AP2	« Le MMSE, test de Folstein, c'est un test de dépistage des troubles cognitifs, que nous utilisons à	«The MMS, the Folstein test, is a test to identify cognitive dysfunctions, and is it is used for two objectives:

		deux buts : premier le dépistage, et deuxième une mesure de performance global en termes de cognition. C'est un test mixte qui mesure à la fois la mémoire, les fonctions exécutifs, les capacités à parler. »	first, the identification and second as a global performance measure of cognition. It is a mixed test that measures memory, executive functions, the oral capacities.»
72	AP2	[suite à la question quels tâches on peut donner pour maintenir les capacités cognitives] « ça dépend de la cause de la dégénération cognitive. Si c'est une démence on a pas accès à la même mesure, si c'est plus lié à un syndrome dépressif ou un trouble de personnalité... ça peut mimer des troubles cognitifs... Il faut surtout assister sur les capacités mnésiques de l'individu en général. Il faut tout renforcer par les capacités mnésiques par entraînement. En termes de fonction executives, je pense que des tests comme le trail making test peuvent aussi être intéressants pour entretenir et entraîner les capacités de reconnaissance et de stratégie. »	[responding to the question what task could be given to keep stable cognitive capacities] it depends on the reason of a cognitive degeneration. If it is dementia... we do not have the same measures, if it is rather the result of a depression or a personality disorder... this may mimic cognitive disorders... The memory capacities have to be strengthened by doing training. Regarding executive function, a test like the trail making test could be interesting in my opinion to stimulate detection and strategic capacities.
73	AP2	« On peut s'inspirer de ce genre de test [trail making test] qui sont visés à la diagnostique pour créer des épreuves ou des jeux d'entraînement. »	«Tests like this [trail making test] that are made for diagnosis might be an inspiration for creating tests for training games.»
74	AP2	« Il faut pas que ce soit douloureux. Il faut qu'il y a une sensation de bien-être. » [Sur la question comment motiver les patients]	«It should not be painful. There must be a sensation of well being.» [responding to the question how to motivate patients]
75	AP2	« Pour les motiver c'est surtout une question d'interaction individuelle. Je ne connais pas une méthode générale pour ça. Mais je pense il y a des prérequis, notamment le bien-être, l'absence de douleur. Sans ça, il n'y aurait pas une motivation pour se déplacer.»	«Motivation is a result of individual interaction. I don't know a general method. I think there are requirements, i.e. well being, the absence of pain. Otherwise, he/she will not be motivated to move.»
76	AP2	[Suite à la question qui est impliqué dans les séances où on discute les cas cliniques] « Dans les groupes CHEOPS par exemple on a le médecin en charge du patient, on a le physiothérapeute, et l'ergothérapeute en charge du patient pour discuter, plus l'infirmier, pour discuter de	[Responding to the question who is implicated during the sessions where clinical cases are discussed: « In the CHEOPS groups for example, there is the treating physician, the physiotherapist, the ergo therapist who is treating the patient in order to discuss, in addition the nurse, in order to discuss each case.

		chaque cas. »	
77	AP2	[quelles questions sont posées à chaque session ?] « Ce sont surtout des questions en terme d'autonomie, de gain d'activité motrice, d'adaptation de l'environnement du patient, l'adaptation des auxiliaires de marche pour lui permettre [?], on parle des facteurs limitants, la perte de la locomotion, ça peut être aussi bien de la médecine, de la psychologie et d'ergothérapie. On discute les projets de vie. »	[what questions are asked during each session?] In general questions about the autonomy, improvement of activity, adaption of the environment to the patient, adaptation of walking frames in order to allow him/her, we talk about limiting factors, loss of locomotion, it might be medical, psychological, and ergotherapeutical. We discuss the future plans [of the patient].
78	AP2	[Suite à la question quelle sorte de physiothérapie est prescrite] « ça peut être une physiothérapie orientée sur une rééducation particulière par exemple des déficits moteurs, gain d'équilibre, ou juste un entretien musculo-articulatoire pour prévenir [?] des articulations »	[Responding to the question what kind of physiotherapy is prescribed] «It might be a physiotherapy that aims at a special reeducation for example for motor deficits, an improvement of balance, or simply an articular stimulation or stimulation of muscles.»
79	AP2	« Il y a des mesures plus quantitatives, par exemple le tapis de marche. On a aussi un appareil pour mesurer l'équilibre de manière numérique ou la force musculaire. »	«There are more quantitative measures, for example the treadmill. We also have a machine to electronically measure balance and muscle strength.»
80	PT1	« Une partie de travail ça va être sur des machines dont je vous montrerai après dans la salle et là on fait un travail au niveau des membres inférieur d'un quart heure à 20 minutes. Ce qu'on appelle plutôt un travail en endurance force. »	«A part of the work can be done using the machines that I will show you later in the room. There we work about 20 minutes on the lower limbs. We call this a training of strength endurance.»
81	PT1	« Ce type d'entraînement on le poursuit seulement si on voit que le patient continue à progresser. Si on voit que c'est vraiment trop difficile, qu'il plafonne très très vite, on va le poursuivre un petit peu et progressivement l'abandonner et on va se diriger vers du purement fonctionnel où on va essayer d'entretenir les transferts, les marches, les escaliers... »	«We do this type of training only when we see that the patient is progressing. When we see that it is really too difficult, that he/she reaches the upper limit, we continue a little bit and then we stop. We continue with something purely functional where we train the dislocations, walks, climbing of stairs.»
82	PT1	[pour planifier la suite du patient après l'hospitalisation] « Nous, au départ on essaie de nous baser à la fois sur le bilan médical qui est fait à l'entrée, mais sur une évaluation personnelle, donc une évaluation pour voir quelles sont	[in order to plan the patient's treatment after hospitalization] At the beginning we try to build on the medical evaluation that is done at admission, but with a personal evaluation, thus the evaluation is done to see the

		les capacités au niveau mobilité, force, et capacité fonctionnelle à l'entrée. »	motor capacities, the strength, the functional capacities when the patient is admitted.
83	PT1	[pour l'évaluation] « On n'utilise pas la mesure d'un appareil. Moi c'est purement une évaluation de la mobilité et de la force qui est manuelle. »	[for the evaluation] «We don't use machines to measure. I do an evaluation of mobility and of force that is manual.»
84	PT1	[Se référant au questionnaire CHEOPS] « C'est plus une évaluation globale de l'équilibre, de certaines capacités, on va dire de mobilité. Mais il n'y a pas vraiment une mesure réelle de la force. Ce n'est pas une évaluation qui permet à nous déjà de voir si le patient a un déficit précis à un endroit ou un autre. »	[referring to the questionnaire CHEOPS] « It is a global evaluation of balance, of certain capacities, like mobility. But it is not really an effective measure of strength. It is not an evaluation that allows a precise localization of the patient's deficit.»
85	PT1	[Pour trouver une activité pour les patients au dehors de l'hôpital] « Ça pourrait être le club d'ainée, ça serait une orientation intéressante pour un certain nombre, par le biais des réseaux sociaux ou des soins à domicile on pourrait les stimuler : allez dans ce type de structure. Il y a la marche pour y aller et là bas vous allez entretenir à la fois sur le plan cognitif, vous pouvez jouer aux cartes... il y a des gyms organisés, des gyms chaises est des choses comme ça qui était fait. Il y a même dans certains clubs où on fait de gym genre Jacques-Dalcroze [se référant probablement au Monsieur Emilie Jacque-Dalcroze et ses instituts de rythmique), ou le Tai Chi qui a été fait ici qui avait aussi reporté dans d'autres centres ou club d'ainées. »	[In order to find activities that the patient can do outside the hospital] «This might be an elderly club, this might be an interesting option for some of the patients, recurring at social networks or home care workers that could stimulate them: go to this kind of structure. There is the walking when going there and you could stimulate at a cognitive level, you could play cards... there are organized gyms, chair exercises and such things that are open to them. There are even some kind of clubs where they do exercises as proposed by Jacques-Dalcroze [probably referring to Mister Emilie Jacque-Dalcroze and his rhythmic institutes], or Tai Chi that is done here and has been used as well in other centers or elderly clubs.»
86	PT1	« On a des machines qui sont assez bien faites parce qu'au lieu d'avoir des poids en faite on a une résistance par air comprimée qui est beaucoup plus douce. »	«We have machines that are quite good because instead of using weights, in fact, they use the resistance that is produced by compressed air which is more comfortable.»
87	ET1	[Suite à la question quelles activités les patients peuvent choisir pour retrouver le plaisir]. « C'est souvent le patient qui propose et après c'est à nous de s'adapter à la demande du patient... C'est vrai que avec les personnes âgées c'est souvent les	[Responding to the question what kind of activities patients could undertake to find again pleasure in doing something] «The patient often suggests and then we try to adapt in response to the patient's wish. But with elderly patients we see often the same ones, cooking,

		mêmes, on retrouve souvent la cuisine, le tricot pour les dames, des loisirs comme les jeux de cartes ou des jeux de société. »	knitting for the ladies, leisure activities like card playing or board games.»
88	ET1	[Suite à la question quelles mesures pourraient être faites pour suivre le patient] « Au plan cognitif c'est intéressant de savoir s'il y a un déclin de performance. Si c'est possible d'avoir un suivi. De pouvoir faire les exercices à un moment donné et puis que cet exercice soit refait. »	[Responding to the question what kind of measures could be used to see the patient's progress] «Regarding cognitive capabilities it is interesting to know whether there is a loss of performance. If it is possible to monitor it. To do the exercise at one time and to repeat it later.»
89	ET1	« Ce qui est important de voir chez les patients c'est surtout en termes de mémoire à courte terme. S'il y a une baisse à ce niveau là. C'est généralement un précurseur d'un début de démence... Donc je ne sais pas par quels types d'exercices ça peut être mesuré mais par exemple de retenir une liste de commission ; de pouvoir réécrire des numéros de téléphone dans leur intégralité en mélangeant des chiffres. »	«It is important to monitor the patient's short term memory. If there is a loss. It is often a sign of an early dementia. I don't know with what kind of exercises this could be measured, but for example the recall of a shopping list; to rewrite complete telephone numbers mixing up the numbers.»
90	ET1	« Au niveau physique c'est intéressant de voir si le patient a un périmètre de marche toujours maintenu. De pouvoir observer, je ne sais comment ça pourrait être fait, les risques de chute. Dans la démarche du patient de voir comment il va utiliser des appuis sur le mur pour se pouvoir déplacer chez lui. De voir s'il y a une modification de sa manière de se déplacer dans le domicile. »	«It is interesting to monitor the range of walk that the patient still can do. To monitor the risk of falling, if that can be done. To see how the patient is using handles that are fixed to the wall in order to dislocate. To see if there is a change in movement in their homes.»
91	ET1	[Suite à la question si les patients aiment bien faire des tâches comme par exemple bouger des pions sur une table] « Alors les tâches analytiques, les patients se lassent dans ce genre d'activité parce que c'est très répétitif. Et puis il n'y a pas de sens facilement compréhensible. En rééducation c'est très bien. Ça nous permet à adapter l'activité à ce qu'on cherche comme performance. »	[Responding to the question whether the patients like to do tasks as for example moving pieces on a table] «The patients usually get bored when doing analytical tasks as it is very repetitive. And then there is no evident reason for doing that. When doing reeducation it works very well. It enables us to adapt the activity to the performance that we like to achieve.»
92	ET1	[ET1 montre les différentes salles de simulation : la cuisine, la toilette, le bain, etc. ; des photos sont prises]	[ET1 shows different simulation rooms : the kitchen, the toilet, the bath, etc. ; photos have been taken]

93	ET1	[ET1 montre quelques outils ergothérapeutiques pour mesurer les capacités ou pour utiliser lors d'une thérapie ; des photos sont prises.]	[ET1 shows several tools that are used in ergo therapy to measure capacities or to be used in therapy. Photos have been taken.]
94	NU1	« C'est vrai que s'il y a un suivi par jeu, si vous proposez des jeux, peut-être il aura un lien qui se va créer, un lien social, parce que souvent ils [les patients] sont un peu délaissés. »	«If you monitor using a game, when you propose to use a game, it might create social relations, because often they [patients] are neglected.»
95	NU1	[Suite à la question quels appareils mobiles les patients ont] « Ce sont ceux pour les personnes âgées souvent. Tout simple. Les gros avec les grandes touches. »	[Responding to the question what kind of mobile devices the patients possess] «There are often those for elderly people. Very simple. The big ones with the big buttons.»
96	AN1	[Suite à la question quels appareils mobiles les patients ont] « Avec la lumière aussi qui s'allumait quand il sonnait le téléphone. »	[Responding to the question what kind of mobile devices the patients possess] «Also with a light that blinks when the telephone rings.»
97	NU1 + AN1	« Nous récemment, il y a quelques personnes qui ont des tablets aussi. Sauf qu'ils savent pas à les faire fonctionner. Et donc qui demande à nous... On perd beaucoup de temps avec ces tablettes. [sur ma question si c'est le fils qui l'achetait]. C'est les enfants qui apportent et après 'débrouille-toi !'. »	«Recently we also had some people who have tablets. But they don't know how to make them work. And then they ask us. We loose a lot of time with thoses tablets. [responding to my question if the son is buying it for them] It is the children who bring it and then 'get happy with it!'.
98	AN1	[sur la questions comment ils utilisent le tablette] « pour regarder des photos, les familles sont loin, il y a des photos pour voir les petits enfants au bout du monde. »	[responding to the question who they use the tablet] «to watch photos, the families are far away, they have photos to see their grand children living at the end of the world.»

Rules

	Participant	French statement	Translated English statement
99	AP1	« Individuellement on va pas se préoccuper si la personne va mieux. Puisque c'est plus notre rôle et on a des nouveaux patients qui sont là. »	« We do not follow the person individually to see whether he/she is doing better. Because it is no more our task and there are new patients arriving.»
100	AP1	« Donc c'est vrai c'est que c'est la première chose qu'on leur dit quand on les voit le premier jour. Je leur demande quel est leur objectif à eux. »	«The first thing that we ask them on the first day. What are your objectives?»
101	AP1	« c'est vraiment le travail du coach, du physiothérapeute, qui va voir le patient tout les jours, et qui va trouver quelqu'un qui est	«It is really the task of the coach, the physiotherapist who is seeing the patients on a daily basis. He/she will meet somebody who is

		motivé et qui va aller faire ou quelqu'un qui n'est pas motivé et qu'il faut stimuler ou quelqu'un qui ne veut pas et qui ne veut pas. »	motivated and who will do it and there are those who are not motivated and need stimulation and then there are those who don't want and don't do.»
102	AP1	« les ergothérapeutes, eux, ils vont surtout être là pour améliorer les instruments de la vie quotidienne. »	«Ergotherapists improve the instruments of daily life.»
103	AP1	« Si on voit que les gens ont des troubles de la mémoire, on va essayer de faire un bilan de la mémoire complet »	«When we see that people have memory dysfunctions, we do a complete memory check.»
104	AP1	« Qu'est-qu'on peut faire pour le [mémoire] stabiliser ? Parce que là on parle plus de stabiliser que d'améliorer. On ne peut plus améliorer les capacités cognitives. »	«What could we do to stabilize [memory] functions ? We must focus rather on stabilization than improvement. Cognitive capacities cannot be improved.»
105	CC1	« On gère ce problème pendant quelques jours. Parallèlement on débute souvent aussi une forme de réhabilitation par la physiothérapie, soit pour un problème aigu, si c'est un problème respiratoire, soit c'est un problème de fracture. »	«We treat the problem during several days. Then we start with some form of rehabilitation using physiotherapy, whether it might be an acute problem, a problem of respiration, or a fracture.»
106	CC1	« quand il est sortie de son problème aigu, on amplifie tous ce qui est nécessaire pour un retour à la maison »	«When he/she is no more suffering from an acute problem, we focus on everything that is necessary for a return at home.»
107	CC1	«...on essaie de préserver un maximum d'autonomie »	«We try to preserve a maximum of autonomy.»
108	CC1	« Et c'est des objectifs avec des moyens qu'on met à disposition. En respectant les moyens on atteint les objectifs. C'est motivant. Mais des choses réalistes. Pas de choses irréalistes... il faudrait que tout le monde ait les mêmes objectifs. »	«It is the objectives and the means we provide them. When we respect the potentials we reach the goals. This is motivating. Realistic things, not irrelastic ones... It is important that everybody has the same objectives.»
109	AP2	[Parlant des facteurs bio-psycho-sociaux] « Il faut que les trois feux sont ouverts pour le retour au domicile. »	[Regarding the bio-psychological-social factors] «When all three lights are green we can suggest a return at home.»
110	AP2	[Explique comment ils prescrivent la physiothérapie] Systématiquement pour tous les patients hospitalisés. Ils sont vus une fois par mois par le physiothérapeute.	[Explains how they prescribe physiotherapy] Systematically for hospitalized patients. They are examined once a month by the physiotherapist.
111	PT1	[PT1 se demande] « Est-ce la personne garde un facteur de peur suite à la chute ou des éventuels chutes ... dans le passé. Par expérience beaucoup de	[PT1 is asking himself] «Is the patient still frightened of falling or by close falls that he/she might have experiences in the past? There are a lot of patients that

		patients qui garde ce facteur peur on va pas faire les travailler avec des exercices équilibre. »	keep that anxiety of falling and then we don't do exercises to improve their balance.»
112	PT1	«Au départ, si le déficit est vraiment très important on travaille de manière analytique, à dire manuelle où on les fait travailler au lit en faisant travailler un peu tous les mouvements possibles au niveau membre inférieur. On essaie à fur et à mesure de la séance d'augmenter la difficulté, quelqu'un qui a un très grand déficit on va commencer avec une mobilisation active assistée qui progressivement peut devenir active pure et ensuite une résistance éventuellement qu'on peut encore ajouter. On va essayer d'y aller graduellement. Parce que chez la majorité des personnes âgées on a cette difficulté de mise en route qu'on retrouve chez pratiquement tous nos patients. Il leur faut quelques minutes se chauffer entre guillemets. »	«In the beginning, when the deficit is really severe, we work analytically and manually. We move them in their beds doing every possible movement with their lower limbs. We then try to progressively increase the difficulty. When somebody has a severe deficit we start with an active and assisted mobilization that may become increasingly active and eventually we can add some resistance. We try to go on progressively. For most of the elderly people it is difficult to start moving. We see that with most of our patients. They need some minutes to warm up so to say.»
113	PT1	[à la question sur auxquelles données il serait intéressé s'il y a un jeu comme prévu dans Mobility Motivator]. « Il faut trouver la tranche de la population qui est la plus réceptive par une telle activité. Est-ce qu'il faut plutôt cibler une population entre 70 et 80 ou au-delà ? Je ne sais pas si certains ont déjà un accès à d'autres outil de type informatique à cet âge là... je n'ai pas l'impression. Je sèche un peu par rapport aux idées. Sans faire une évaluation sur place. Bon à moins que le patient nous dit simplement je suis sorti plusieurs fois dans la journée, je suis monté deux étages d'escalier... On reprenant effectivement des choses simples, et que lui quotidiennement pendant une certain période va cocher : alors j'ai fait telle, telle et telle chose. »	[Responding to the question what kind of measures they may be interested in when they have a system like Mobility Motivator] «You have to find the right population that is open for such a kind of activity. Should a population between 70 or 80 be targeted, or older? I don't know if some of them already have access to this type of technology at their age, I don't think so. It is difficult to come up with ideas. Without doing an evaluation at their homes? Maybe that the patient could just say: I left the house several times a day, I climbed several levels in the stairway. Using simple things and he/she would check once a day : I have don't this, I have done that.»
114	NU1	« Sur le plan cognitif tout se fait en négociation et en proposition. On fait jamais du forcing. On apprend à connaître la	«On a psychological level we use negotiation and suggestions. We never force the patient. We learn to know the person... each

		personne... chaque patient a ses particularités. »	patient has some particularities.»
115	NU1	« Tout ce fait par des étapes. » [se référant à comment motiver les personnes âgées]	«Everything is done in steps.» [when responding to the question how to motivate people]
116	NU1	« La motivation sur le plan cognitif, on les explique pourquoi c'est toujours mieux de se lever parce que restant en lit on perd des muscles, on a des déformations. »	«To motivate them on a psychological level, we explain them why it is always better to stand up because when you stay in the bed you lose muscles and you will have deformations.»
117	AN1	[suite à la question s'ils acceptent les arguments pour les motiver à bouger] « Chacun est différent. Vous allez avoir des gens qui vont être motivés parce qu'ils savent que en faisant ces efforts ils vont devoir rentrer à la maison. Il y a d'autres personnes qui savent que même en faisant ces efforts-là ils ne vont pas rentrer à la maison. Pour eux c'est plutôt le syndrome de glissement. On a beaucoup plus de difficultés avec ces personnes là. »	[responding to the question whether they accept the arguments to do more exercises]. «Each one is different. You will have people who are motivated because they know when they do the exercises they might return at home. There are other persons who know that even if they do the exercises they will not be able to return at home. Those have the "sliding" [?] syndrome. We have much more problems with them. »
118	NU1	« C'est un tout, si ça ne va pas sur le plan moral, ça ne va pas marcher sur le plan physique. »	« It is everything together, if it is not working on the motivational level, it will not work on the physical level. »
119	NU1	[NU1 raconte de ses expériences quand elle était une infirmière qui visitait les patients à la maison]. « On essaie de garder les acquis... C'est quoi le plus important pour le patient ? Pour certains, un petit papi c'est d'aller prendre son petit café en bas dans son immeuble, donc on fait tout pour qu'il garde cet acquis pour pouvoir prendre son café ou sa bière avec ses copains parce que au plan social c'est important. Pour une autre dame, ce qui est important pour elle à domicile, c'est d'aller s'asseoir dans son fauteuil et de regarder la télé. Elle se fout complètement d'aller dehors et de faire ses courses. Déjà on détermine à domicile et ici, c'est quoi ce qui est le plus important pour eux, pour le patient. »	[NU1 talks about her experiences when she was a nurse who visited patients at home]. «We try to keep their abilities. What is most important for the patient? For some, for the old father it is to talk a coffee in the café down in the building he is living. We do everything to keep that ability to have a coffee or a beer with his friends. It is an important social factor. For another lady, for her it is important that she can be at home, sitting on the couch and watch TV. She does not care about doing groceries. What we determine at home, and also here: what is most important for the patient?»
120	NU1	« Quand ils sont à la maison on cherche pas le progrès, mais la stabilité. Quand ils sont à la maison ça veut dire qu'ils sont autonomes. »	«When they are at home we don't look for improvement, but for stability. When they are at home it means that they are autonomous.»

121	PT1	« Chez les patients chuteurs...la rééducation va beaucoup porter sur un travail de renforcement musculaire au niveau membre inférieur et également travailler un peu l'équilibre. »	«For the patients who fall we train a lot the strength of the lower limbs and also balance. »
122	ET1	[suite à la question de ce que l'ergothérapeute fait quand le patient n'arrive pas à apprendre les gestes pour être autonome à la maison] « Soit le retour à la maison n'est pas compromis et on peut installer des moyens auxiliaires qui peuvent l'aider à réussir la tâche demandée, soit la tâche est vraiment impossible et il faut qu'on arrive à palier ça par l'intervention d'une tierce personne à domicile, la famille ou des soignants »	[responding to the question what the ergotherapist is doing when the patient do not regain the abilities to live autonomously at home] «(Either the return at home is still possible and we give them auxiliary material that support him/her in doing the tasks, or the task is really impossible and we need to palliate with a third person at home, may it be family or care takers.»

Community

	Participant	French statement	Translated English statement
123	CC1	« Il faut les intégrer [la famille], mais, voilà, à nouveau, 80 ans, des habitudes, une hiérarchie sociale dans la famille qui fait que certains sont complètement imperméables aux messages de la famille. Ou les familles par contre sont beaucoup trop directives. »	[The family] «needs to be integrated, but again, at the age of 80, there are habits, a social hierarchy can be found in the family. This may turn them completely resistant to family advice. Or, on the contrary, they are much to directive.»
124	CC1	« Sa femme l'a freiné de peur qu'il refasse un attaque. Alors, c'est l'inverse qu'il faut faire. Là il y a quand-même un travail de rééducation à faire »	«His wife has discouraged him because she was afraid that he has another heart attack. Reeducation is necessary in those cases.»
125	AP2	[Sur la question quels acteurs agissent sur la motivation] « Les travaux en groupes peuvent jouer là-dessus, leur permettre de reprendre confiance en eux et de gagner de la motivation. »	[Responding to the question what actors have an effect on the motivation] «Group work can have a positive effect to regain confidence and motivation.»
126	PT1	[La famille] « Elle devrait jouer un rôle plus important, mais on se rend compte que en tout cas ici sur Genève la famille est très moyennement investie. Aussi bien dans le sorti des patients, pour les stimuler, pour les sortir de leur isolement. »	The family should play a more important role, but we know that here in Geneva the family is not very committed. May it be for taking out the patients, or for stimulating them, or to take the out of their isolation.
127	ET1	« La famille est souvent utilisée comme mains d'œuvre pour faire les tâches à la place du patient. Le patient devient	«The family is often used as helping hands to do tasks instead of the patient. The patient becomes dependent of others. We

		dépendant d'un tiers... C'est vrai que dans la mesure du possible on essaie que la famille est là plutôt pour surveiller et aider le patient de faire les tâches seul plutôt qu'à faire à sa place. Ça c'est une rééducation à faire qui est un peu compliquée. »	encourage the family as good as possible to supervise the patient and to help the patient do the tasks autonomously rather than do the tasks in place of the patient. Reeducation is necessary but it is quite complicated.»
128	NU1	[suite à la question sur la relation entre famille, patient, et personnel du soin] « Dès le départ d'avoir une communication, que la famille et le patient sentent que nous sommes à l'écoute. »	[responding to the question about the relation between family, patient and health care personnel] «We need to communicate from the beginning. The family and the patient need to know that we are listening to them.»
129	NU1	« Mais en même temps on est pas là pour que de donner de conseil. Parce que les familles connaissent mieux leur parent que nous. Des fois c'est eux qui nous donnent des conseils. C'est vraiment un échange. »	«But we are not only here to make suggestions. The family knows their parents better than us. Sometimes it is them who do propose us [things]. It really is an exchange.»
130	PT1	[Parlant d'une étude qu'il a faite il y a env. 20 ans]. « Dans ces clubs [d'ainées], les patients, un certain nombre de personnes viennent pour une activité quelle soit sociale ou simplement des jeux divers mais également des activités physiques. Et certains patients se prêtent très bien mais c'est vrai que pas tous les patients aiment des activités en groupe. »	[Talking about a study that has been conducted about 20 years ago]. «Some of the patients in the elderly clubs go there to do an activity, may it be social or just to play some games, but also to do physical exercises. Some of the patients are suited for this but not all of the patients like group activities.»
131	NU1	« On les fait bien comprendre que c'est un partenariat et on ne pourrait pas faire à leur place. On essaie de faire des objectifs censés. »	«We make them understand that it is team work and we cannot do things in their place. We try to fix reasonable objectives.»

Division of labor

	Participant	French statement	Translated English statement
132	AP1	« ce qu'on a fait au moment de la sortie c'est qu'on a le plus souvent organisé une réunion avec, on essaie, avec la famille, avec les infirmières qui vont s'occuper du patient au domicile, parfois avec le médecin traitant qui va s'occuper du patient, pour faire le point entre leur relais, de ce qui s'est passé à l'hôpital et ce qui fait à la maison. »	«When they leave the hospital we try to organize a meeting with the family, the nurses that are treating the patient, sometimes with the future treating physician, to organize the transfer, what has happened in the hospital and what will be done at home.»
133	AP1	« ...les infirmiers du domicile. Par	«The nurses that make home visits.

		exemple les infirmières de l'IMAD, qui sont des infirmières qui prennent le relais à domicile. »	For example the nurses at IMAD, they do provide the continued care at home.»
134	AP1	« On peut déjà parfois mettre en place des foyers de jours, des hôpitaux de jours... »	«Sometimes we can do preparations for day care facilities, day care hospitals»
135	AP1	« On sait pas si ça se suivie. On ne sais pas s'il va bien. Mais c'est vrai qu'on le met en place. »	«We don't know how the progress is. We don't know if he/she is doing well. But we do the preparations.»
136	AP1	« On a aussi des groupes de gym seniors »	«We also have a group for exercises for elderly people.»
137	CC1	« Dans cette réadaptation on implique les physiothérapeutes, les ergothérapeutes,.... Elle implique parfois les psychologues et les psychiatres. Parce que dans certains cas ça fait partie d'une réadaptation. »	«In this kind of readaptaion we include the physiotherapists, the ergotherapists. Sometimes we also include the psychologists or the psychiatrists because in certain cases this is part of a readaptaion.»
138	CC1	« Ça implique l'équipe soignante... Souvent ce sont les aides soignants qui le font marcher ou la famille... Il y a une composante de famille qu'on peut aussi encourager. »	«That includes the care team... often it is the auxiliary nurses that make them walk, or the family. There is also the family that we can encourage.»
139	CC1	« Les assistants sociales sont impliqués pour accompagner le retour du patient pour mettre en place des aides »	«The social workers are included in the attendance of the patient at his return and to put in place the auxiliary tools.»
140	CC1	« On fait des réunions de famille, une réunion dite pluridisciplinaire, d'orientation, ou des réunions réseaux, ou on incorpore la famille avec des assistants sociaux, le physio, l'ergo, l'infirmière, et le médecin. Il y a des réunions qui ont lieu pour qu'il y ait ce message de groupe qui soit délivré. » [pour motiver le patient de changer ses habitudes]	«We do meetings with the family, a pluridisciplinary meeting, in order to give an orientation, or networking meetings, where we include the family and the social workers, the physiotherapist, the ergotherapist, the nurse, the physician. There are meetings that are organized in order to communicate this message. [to motivate the patient to change habits]
141	AP2	« Dans les accueils de jour ça devrait exister. » [Se référant à des thérapies qui visent à freiner la diminution des capacités cognitifs.]	«That might exist in the day care centers.» [responding to the question what therapies exist to slow down the cognitive decline.]
142	AP2	« On a parfois contact avec leur médecin traitant en ville et aussi parfois, plus souvent, avec l'unité de gériatrie communautaire. Qui sont déjà là, qui peuvent intervenir et qui aussi peuvent assurer un suivi. »	We are sometimes in contact with the treating physician in town and sometimes, more often, with the division of collective geriatrics [?]. They are already there, they can intervene and offer a post-treatment.
143	AP2	[Suite à la question quelles informations ils ont besoin des médecins d'un autre service/hôpital/institution]. « Tout	[Responding to the question what kind of information physicians need from other units/hospitals/institutions] The

	le dossier médical, pareil sur le modèle bio-psycho-social, pour connaître les antécédents médicaux, son fonctionnement psychologique aussi, et le tissu social dont il peut bénéficier.»	complete medical record, also the bio-psychological-social model, to know the medical antecedents, the psychological state and also the social network of the patient.
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4.1.5 Discussion

The goal of our study was to identify the requirements that health care professionals have regarding a future system. The functionality requirements for physician were not a major subject of the interviews. The offices of all interviewed health care professionals are equipped with standard computers. Among other tasks, they use the computers to access the medical record, to prescribe treatments, to validate the application of a treatment, and to write letters and emails. The computers and the clinical information system are an integral part of their work. The population we interviewed would use this system (or a similar system) to monitor their patients.

For the content requirements we identified a large number of needs. It is open for discussion what needs should be implemented in the system that is envisioned. Following main points have been identified:

- The patients in the medical division that were visited had an age of at least 65 but a mean age of 85 (17, 29) who have difficulties to walk and who have a risk of falling (20). They may also have undergone some surgery (30) or had some illness (21) and need to recover. 50 % suffer from a cognitive disorder and 25 % suffer from dementia (25). They also have psychological and social problems (27).
- The health care professionals do not follow the progress of patients once they have left the hospital (12, 27) but they prepare the follow-up care (2, 10, 134, 135).

- In the population we studied at the hospital the goal of the health care professionals is to regain a maximum of autonomy for their patients (107) or to stabilize their situation when they are at home (120). In this elderly population there is no need to increase the performance in physical activities beyond improving the quality of life. This might be interesting for the project as there is a shift in the goals in prescribing physical activities between the age of 65 and 80.
- The goals of the patients are diverse. The health care professionals agree that the goal of the patient has first to be determined in discussion with the patient (15, 100).
- Physicians, nurses, physiotherapists, and ergotherapists are involved in the treatment of the patient. Sometimes a psychologist and a psychiatrist are consulted in addition (76, 77, 137).
- Family members play an important role in the motivation of the patient (126, 129, 138). However, they are sometimes over protective and do the tasks of the patient in his/her place (123, 127). There is a need to educate the members of the family (124).
- The population studied uses often cell phones with big buttons (36, 44, 95). Some patients even have tablets but they do have problems at their age to use them (36, 97). They use them mainly to look at photos (98).
- There are forms that are used to evaluate physical capabilities: the CHEOPS (66, 68, 76, 84) and the short physical performance battery (68, 69, 70) both in annexe. Included in this questionnaire is the "Timed Up and Go test" (51). There is also the MIF, measure of functional independence, (48, 49, 67) that is used as a transversal evaluation (in annexe). The physiotherapist prefer however to

do a manual evaluation of the patient as the forms mentioned do not provide specific information on the location of the problem and the level of strength (84). The weight and the BMI are the basic measures of the physical condition that are used (51).

- For the evaluation of cognitive capacities, the MMS by Folstein is used (55, 71) which is a simple and global evaluation of cognitive abilities.
- There is no improvement of cognitive functions possible except when they are the result of a depression or a personality disorder (71).
- When doing exercises there must be some slow warm-up phase. The intensity can then be gradually increased (112).
- It is important that patients do not feel pain when doing exercises and that they are in a state of well being when performing the exercise (74, 75).
- The main motivation for patients at the hospital to do physical exercises is the prospect of going home (53, 58, 117). When the patient does not have hope to return home it is difficult to motivate him/her (117).
- When looking at their patients there is some scepticism whether a serious game could be used (39, 40). However, they see some ways to use games for physical or cognitive activities (73, 94, 113)
- There are a number of facilities that patients can use after they left hospital: day care centres (47, 141), elderly clubs (86, 131), and exercise facilities (47, 85, 136).
- As health care professionals at the hospital don't know the later progress of the patient, they are interested in a feedback to see if their work makes any sense (1).

- Physicians consider themselves not as good prescribers of physiotherapy (4). Maybe the Mobility Motivator could provide some decision guide lines for prescription of physical activities?

4.2 Study 2: Focus group with medical experts

The aim of the focus group was to elicit medical knowledge that is present within the Mobility Motivator consortium and to include an external expert in the discussion. The subject of the focus group was the needs of the secondary user group regarding encouragement of physical, social and cognitive activity in the elderly persons.

4.2.1 Population

The recruitment of the focus group was done during a Mobility Motivator meeting at the Geneva University Hospitals.

A group of four core members for the focus group was determined. They were selected by the fact that they were trained physicians. They are listed in the following table.

Participant	Medical specialty
SM	Sports Medicine
EN	Endocrinology
OP	Ophthalmology
IM	Internal medicine

In addition, all other present consortium members (N = 10) took part as extended members of the focus group.

4.2.2 Procedure

The moderator invited all the members of the focus group in a room at the Geneva University Hospitals.

The participants were informed that two groups are formed: the group of physicians (core focus group) that were placed at a

separate table, and the rest of the participants (extended focus group) that faced the core focus group as audience.

It was explained that the moderator will ask questions that the core focus group can discuss freely. The moderator would not interrupt the discussion or change topics unless necessary.

The extended focus group (the audience) may ask questions at any time but only when they made a sign in order to be included in the discussion by the moderator.

The participants were informed that the focus group should keep a clinical focus. It was explained that the goal of the focus group is an exchange of point of views and that there is no need to come to a conclusion. The discussion would be voice recorded.

The maximum time for the focus group was fixed at 60 minutes. All members of the focus group agreed to the rules.

4.2.3 Results

In the following are key statements made by the health care professionals.

In the transcriptions following syntax conventions are used:

- [?] a term that was not understood
- ... some statements were cut out because they were not relevant
- [] comment by author to make the context of the statement clear

Key statements

OP: *"You have always to differentiate if you talk about mobility and motivation and stipulation, ... between the personal situation of the patient and the group this patient belongs to."*

OP: "I see a certain conflict between personalized treatment and a general approach."

OP: "We do need clinical or physiological parameters to measure the effect to see its appropriateness."

IM: "If you look at what is known in medicine, ..., there is no doubt that for any group of citizen or any group of population; of course there are some exceptions, where there can exist contraindications, people allergic to effort... If you take the literature you can see that physical activity and sustained physical activity is positive for health."

IM: "Everybody knows this. It is like cigarettes. The problem is how to motivate each individual, ..., to do this physical activity and give this person sufficient motivation, incentives, and perception on return on investment, so to say, so that they actually do it."

IM: "To my opinion, we shall not consider as a primary object of the project to show that increased physical activity has a positive effect on health, this is known."

SM: "I think we know that physical activity is totally effective in primary or tertiary prevention... We know that there are very few contra indications."

SM: "The problem for physicians is not to prescribe physical activity, the question is how, when, and to whom prescribe physical activity. Where can I send my patient to do physical activity."

SM: "The second problem is that there are persons that are effectively not motivated."

SM: "We have to put the patient in the centre. We have to individualize. We have to know the environment of the patient, the

neighbourhood [better translation of French word 'entourage': personal environment], the peers, the family."

SM: "We have also to evaluate: the level of physical activity and the level of sedentarity."

SM: "Physical activity is not only sport."

SM: "There is an important interaction between the patient and the neighbours [not correct translation of french word 'entourage', rather personal environment]. Positive and negative.

SM: "You move more in the cities than in the countries."

SM: "If we want to motivate, the environment is important. Do we have a park, a cycle lane, a dog, a woman, a husband."

SM: "First we evaluate the physical level of activity and the level of sedentarity." ... "We have to have an idea of the physical condition, strength on a cardiovascular level, we can measure speed on a four meter level."

EN: "At the hospital where I see patients, many of them have long lasting diabetes and they don't really know that physical activity would help them. To my surprise, a lot of my colleagues always focus on diet, blood sugars, weight, adjusting the insulin dose. Many of them say that it is a waste of time to emphasize physical activity. They may say that they don't have the time for it, but they don't have the tools for it."

OP: "If you recommend physical activity and the patient come in at a daily basis you are not paid for that [prescribing physical activity] as a physician. They don't have time for that."

SM : "You can use GPS to show them where they [the places] are [to do physical activities]. The French ministry of health is trying to

make a list of every place in France where people can do physical activity.”

SM: “JAMA has published a recommendation for cancer survivors, taking into account the state of the patient... You just have three levels: the treatment of the patient, physical activity before the cancer, and the complication of the treatment.”

SM: “We have contacted every sports association ... can you propose not only competition, but sports for health, yes or no? 80 % have responded yes.”

SM: “Elderly people are different, because they are at risk of sarcopenia [degenerative loss of skeletal muscle mass], less muscles, less strength, less coordination, higher risk of falling”.

EN: “The veterans health care center has a large group of seniors with a lot of chronic diseases... They take part in physiotherapy. The motivation is high.” [referring to the tele-physiotherapy sessions in connection with other retirement centers and residences for seniors.]

SM: “Basically, there are not a lot of differences [in needs between elderly and younger people regarding a future system]”

SM: [Response to the question on the information need to monitor activity:] “Level of physical activity, the time spent sedentary. Perhaps, if we want to add something: quality of life, some feedback on feelings. Perhaps the weight. It depends, you have to look at the population.”

EN: “We promote human relationships [response to the question on how to motivate lower social classes]”.

SM: “You have the goal that patients go out of home and to do physical activity. The social world of physical activity is evident [The

role of social interactions for physical activity is evident]. We should find a way to promote the social effect.”

OP: “Mobility motivation alone does not lead to anywhere. People will abstain of being more active if they don’t have additional benefits... For example let us say some additional social benefits, against social deprivation in elderly, supervision of homework for school children, if you bring that together, that could add on.”

SM: [To the question what would be the ideal system in an ideal scenario.] A system that is interactive. A system that integrates the feeling of the patient. It is not something like: “you should do that”. Integration of somebody in front of him. Not obligatory a physician. Young people with difficulties so that they can exchange. Integration of family, of the environment. For something that is long lasting.”

4.2.4 Discussion

The main points that were mentioned in the discussion are:

- There is a need for objective measures to monitor physical activities.
- Not only activity but also sedentarity has to be measured.
- It is important that the approach is individualized.
- The family, the peers and the social context has to be included in the therapy.
- The open question is how, when, and whom contact to prescribe physical activity.
- People need benefits in addition to physical activity to motivate them.
- There is the problem of lack of time (and reimbursement) when prescribing physical activities.
- The project must not consider as a primary object that

increased physical activity has a positive effect on health as it is known.

5. Literature

Abt, C.C., 1970: *Serious Games*. New York City.

Anderson-Hanley, C., P.J. Arciero, A.M. Brickman, J.P. Nimon, N. Okuma, S.C. Westen, M.E. Merz, B.D. Pence, J. a Woods, A.F. Kramer & E. a Zimmerman, 2012: Exergaming and older adult cognition: a cluster randomized clinical trial. *American journal of preventive medicine* 42: 109–19.

Bandura, A., 2001: Social cognitive theory: An agentic perspective. *Annual Review of Psychology* 52: 1–26.

Beyer, H., & Holtzblatt, K., 1997: *Contextual design: defining customer-centered systems*. Elsevier.

Burke, J.W., M.D.J. McNeill, D.K. Charles, P.J. Morrow, J.H. Crosbie & S.M. McDonough, 2009: Optimising engagement for stroke rehabilitation using serious games. *The Visual Computer* 25: 1085–1099.

Byberg, L., H. Melhus, R. Gedeberg, J. Sundstrom, A. Ahlbom, B. Zethelius, L.G. Berglund, A. Wolk & K. Michaelsson, 2009: Total mortality after changes in leisure time physical activity in 50 year old men: 35 year follow-up of population based cohort. *Bmj* 338: .

Hakim, A.A., H. Petrovich, C.M. Burchfiel, G.W. Ross, B.L. Rodriguez, L.R. White, K. Yano, J.D. Curb & R.D. Abbott, 1998: Effects of walking on mortality among nonsmoking retired men. *The New England Journal of Medicine* 338: 94–99.

Ijsselsteijn, W., H.H. Nap, Y. de Kort & K. Poels, 2007: Digital game design for elderly users. *Proceedings of the 2007 conference on Future Play - Future Play '07* 17.

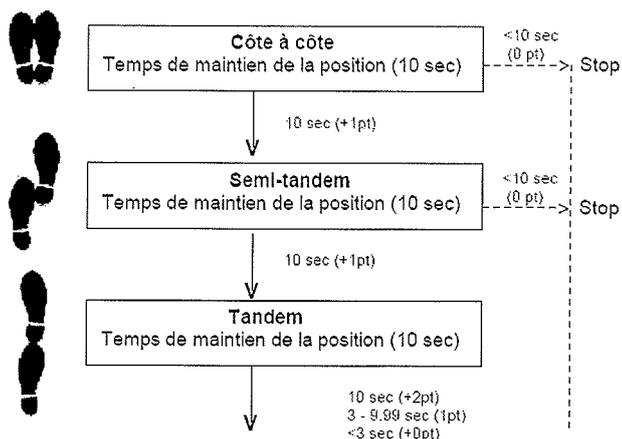
InitiativeD21 (Ed.), 2013: *D21-Digital-Index. Auf dem Weg in ein digitales Deutschland?! Berlin*.

Kim, H. & W.-Y. Choi, 2008: Willingness to use formal long-term care services by Korean elders and their primary caregivers. *Journal of aging & social policy* 20: 474–92.

- Kruse, A., 2009: Prävention und Gesundheitsförderung im Alter. pp. 81–91 in: K. Hurrelmann, T. Klotz & J. Haisch (Eds.), Lehrbuch Prävention und Gesundheitsförderung. Bern: Hans Huber Verlag.
- Kuutti, K., 1996: Activity theory as a potential framework for human-computer interaction research. Context and consciousness: Activity theory and human-computer interaction, 17-44.
- Leonhardt, C. & M. Laekeman, 2010: Schmerz und Bewegungsangst im Alter. Schmerz (Berlin, Germany) 24: 561–8.
- Lippke, S. & B. Renneberg, 2006: Theorien und Modelle des Gesundheitsverhaltens. pp. 35–60 in: B. Renneberg & P. Hammelstein (Eds.), Gesundheitspsychologie. Heidelberg.
- Lloyd-Jones, D., R.J. Adams, T.M. Brown, M. Carnethon, S. Dai, G. De Simone, T.B. Ferguson, E. Ford, K. Furie, C. Gillespie, A. Go, K. Greenlund, N. Haase, S. Hailpern, P.M. Ho, V. Howard, B. Kissela, S. Kittner, D. Lackland, L. Lisabeth, A. Marelli, M.M. McDermott, J. Meigs, D. Mozaffarian, M. Mussolino, G. Nichol, V.L. Roger, W. Rosamond, R. Sacco, P. Sorlie, R. Stafford, T. Thom, S. Wasserthiel-Smoller, N.D. Wong & J. Wylie-Rosett, 2010: Heart disease and stroke statistics--2010 update: a report from the American Heart Association. Circulation 121: e46–e215.
- Malanowski N (2009): ICT-Based Applications for Active Ageing: challenges and Opportunities, in: Cabrera, M; Malanowski N (eds.): Assistive Technology Research Series, Volume 23: Information and Communication Technologies for Active Ageing. Opportunities and challenges for the European Union, pp. 107-127.
- McAuley, E., K.S. Morris, R.W. Motl, L. Hu, J.F. Konopack & S. Elavsky, 2007: Long-term follow-up of physical activity behavior in older adults. Health psychology: official journal of the Division of Health Psychology, American Psychological Association 26: 375–80.
- Mhurchu, C.N., R. Maddison, Y. Jiang, A. Jull, H. Prapavessis & A. Rodgers, 2008: Couch potatoes to jumping beans: A pilot study of the effect of active video games on physical activity

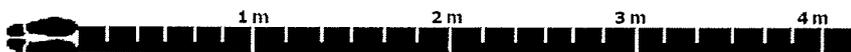
- in children. *International Journal of Behavioral Nutrition and Physical Activity* 5: 1–5.
- Schwarzer, R., 2004: *Psychologie des Gesundheitsverhaltens - Einführung in die Gesundheitspsychologie*. Göttingen.
- Sostmann, K., D. Tolks, M. Fischer & S. Buron, 2010: *Serious Games for Health : Spielend lernen und heilen mit Computerspielen ? Serious Games for Health : Learning and healing with video games ?* *GMS Medizinische Informatik, Biometrie und Epidemiologie* 6: 1–8.
- Tan, B., a R. Aziz, K. Chua & K.C. Teh, 2002: *Aerobic demands of the dance simulation game*. *International journal of sports medicine* 23: 125–9.
- United Nations (2012): *Population ageing and development 2012*, available at: http://www.un.org/esa/population/publications/2012WorldPopAgeingDev_Chart/2012PopAgeingandDev_WallChart.pdf
- Väätänen, A. & J. Leikas, 2009: *Human-Centred Design and Exercise Games*. pp. 33–47 in: M. Kankaanranta & P. Neittaanmäki (Eds.), *Design and Use of Serious Games*. Springer.
- Wiemeyer, J., 2010: *Gesundheit auf dem Spiel ? – Serious Games in Prävention und Rehabilitation*. *Deutsche Zeitschrift für Sportmedizin* 61 .
- Winkel, S., F. Petermann & U. Petermann, 2006: *Lernpsychologie*. Paderborn.
- Wittman, G., 2010: *Video Gaming Increases Physical Activity*. *Journal of Extension* 48: 6–9.

1. Test d'équilibre bipodal non réalisé



Côte à côte	
Temps	<input type="text"/> sec
Tient 10 sec	<input type="checkbox"/> 1 pt
Ne tient pas 10 sec	<input type="checkbox"/> 0 pt
Non tenté	<input type="checkbox"/> 0 pt
Semi-tandem	
Temps	<input type="text"/> sec
Tient 10 sec	<input type="checkbox"/> 1 pt
Ne tient pas 10 sec	<input type="checkbox"/> 0 pt
Non tenté	<input type="checkbox"/> 0 pt
Tandem	
Temps	<input type="text"/> sec
Tient 10 sec	<input type="checkbox"/> 2 pt
Ne tient pas 10 sec	<input type="checkbox"/> 1 pt
Non tenté ou <3 sec	<input type="checkbox"/> 0 pt
Score total du test	<input type="text"/> pts

2. Test de vitesse de marche non réalisé



Aide à la marche?

- Aucune Tricycle (3 roues)
- 1 Canne simple Rollator (4 roues)
- 2 Cannes simples Cadre
- 1 Canne ATB Autre :
- 2 Cannes ATB

<input type="checkbox"/>																			
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2.1 Temps pour le 1er test de vitesse de marche (sec)

Temps pour 4 mètres : sec

2.2 Temps pour le 2ème test de vitesse de marche (sec)

Temps pour 4 mètres : sec

Temps le plus court > 8.70 sec	<input type="checkbox"/> 1 pt
Temps le plus court entre 6.21 et 8.70 sec	<input type="checkbox"/> 2 pts
Temps le plus court entre 4.82 et 6.20 sec	<input type="checkbox"/> 3 pts
Temps le plus court < 4.82 sec	<input type="checkbox"/> 4 pts

3. Test de lever de chaise (bras croisés sur la poitrine) non réalisé

Pré-test (1 répétition)

- Capable de se lever sans aide Oui Non
- Participant utilise les accoudoirs pour se lever Oui -> fin du test **Score 0 pt**
- Test non terminé Oui -> fin du test **Score 0 pt**

Test (5 répétitions)

- Capable de se lever cinq fois Oui Non
- Si les cinq levers effectués, temps enregistré en secondes : sec

Test non réalisable ou en + de 60 sec	<input type="checkbox"/> 0 pt
Temps entre 16.70 et 59.99 sec	<input type="checkbox"/> 1 pt
Temps entre 13.70 et 16.69 sec	<input type="checkbox"/> 2 pts
Temps entre 11.20 et 13.69 sec	<input type="checkbox"/> 3 pts
Temps < 11.19 sec	<input type="checkbox"/> 4 pts



EdS (ou étiquette): _____

Effectué le : ____/____/____

Initiales (physiothérapeute) : _____

Etiquette patient avec code barre

SPPB NON RÉALISÉ DANS LES 48 HEURES SUIVANT LA DEMANDE

SPPB OU TEST NON RÉALISÉ

☞ **PRÉCISER LE MOTIF AU VERSO**

Score global 1+2+3 = pts /12 pts



Si SPPB non réalisé dans les 48 heures suivant la demande, préciser le motif :

Si SPPB non réalisé, préciser le motif :

Motif	SPPB
1- Patient incapable de réaliser les trois tests sans assistance	<input type="checkbox"/>
2- Non tenté, non sécuritaire pour le patient selon le jugement du physiothérapeute	<input type="checkbox"/>
3- Non tenté, le patient ne se sent pas en sécurité	<input type="checkbox"/>
4- Patient incapable de comprendre les consignes	<input type="checkbox"/>
5- Refus du patient	<input type="checkbox"/>
6- Autre (<i>préciser</i>) : _____ _____	<input type="checkbox"/>

Si 1 ou 2 tests non réalisé(s), préciser le motif :

Motif	A- Equilibre	B- Vitesse de marche	C- Lever de chaise
1. Patient incapable de tenir la 1 ^{ère} position sans assistance	<input type="checkbox"/>	 	
2. Patient incapable de marcher sans assistance	 	<input type="checkbox"/>	
3. Patient incapable de se lever sans assistance	 	 	<input type="checkbox"/>
4. Non tenté, non sécuritaire pour le patient selon le jugement du physiothérapeute	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Non tenté, le patient ne se sent pas en sécurité	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Patient incapable de comprendre les consignes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Refus du patient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Autre (<i>préciser</i>) : _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Moyen Auxiliaire à domicile

- Sans
- Canne Simple
- 2 Cannes Simples
- Canne ATB (anglaise)
- 2 Cannes ATB (anglaise)
- Canne Quadripode
- Cadre Fixe
- Cadre 2r + 2p
- Tricycle (Delta)
- Rollator 4r

Chaussage

- Convenable
- Adapté par Pro
- Non Adapté

Souplesse Chevilles

- Satisfaisante
- Limitée

Palesthesie

- Satisfaisante
- Diminuée
- Perte Complète

Vue

- Satisfaisante
- Perturbée

Romberg

- Positif
- Négatif
- non réalisé

Ouïe

- Satisfaisante
- Perturbée

Escaliers à domicile

- 0.5
- 1 Etage
- 2 Etage
- 3 Etage et +
- Non

Conséquence des chutes

- Fractures
- Contusions
- Abrasions
- Autres
- Aucune

Peur de Tomber

- Oui
- Non
- Parfois

Nombre de chutes / 12 mois

- 0
- 1
- >1

Ramasser un objet au sol

- capable
- incapable

Remarques / observations générales :

M.I.F - Mesure d'Indépendance Fonctionnelle

Veillez évaluer chacune des activités suivantes.

Veillez cocher une seule réponse par fonction.

Activités	Sans aide		Avec aide				
	Indépendance complète	Indépendance modifié	Supervision / mise en place	Assistance avec contact physique minimal	Assistance modérée	Assistance maximale	Assistance totale
	(en toute sécurité et en laps de temps normal)	(moyens auxiliaires)	(patient : 100%)	(patient : 75% et plus)	(patient : 50% et plus)	(patient : 25% et plus)	(patient : moins de 20%)
Soins personnels							
1. A. Alimentation	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
2. B. Soins de présentation et de l'apparence	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
3. C. Toilette (se laver)	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
4. D. Habillage haut du corps	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
5. E. Habillage bas du corps	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
6. F. Utilisation des toilettes (hygiène)	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Contrôle sphincters							
7. G. Contrôle de la vessie	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
8. H. Contrôle des selles	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Transferts							
9. I. Transferts lit, chaise, fauteuil roulant	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
10. J. Transferts aux toilettes	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
11. K. Transferts baignoire, douche	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

	Sans aide		Avec aide				
	Indépendance complète	Indépendance modifiée	Supervision / mise en place	Assistance avec contact physique minimal	Assistance modérée	Assistance maximale	Assistance totale
Activités	(en toute sécurité et en laps de temps normal)	(moyens auxiliaires)	(patient : 100%)	(patient : 75% et plus)	(patient : 50% et plus)	(patient : 25% et plus)	(patient : moins de 20%)
Déambulation							
12.L. Marche, fauteuil roulant	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
<input type="checkbox"/> M-marche ; F-fauteuil ; D- deux							
13.M. Escaliers	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Communication							
14.N. Compréhension	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
<input type="checkbox"/> A-auditive ; V-visuelle ; D- deux							
15.O. Expression	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
<input type="checkbox"/> V-verbale ; N-non-verbale ; D- deux							
Capacités relationnelles et cognitives							
16.P. Interaction sociale	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
17.Q. Résolution des problèmes de la vie quotidienne	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
18.R. Mémoire	<input type="checkbox"/> 7	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1