AAL Project

NITICS

Networked InfrasTructure for Innovative home Care Solutions

WP2: End-user requirements and service concepts

D2.1: The results of the multi-national survey

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Executive Summary

The main goal of this document was to report on the results on two multi national surveys curried out between a group of elderly and among caregivers. The survey was carried out in 5 countries: Poland, Romania, Slovenia, France and Switzerland (mainly in big towns and cities). The research serves as a base for designing end-user services within the Work Package 2 of the NITICS project.

Section 1: Introduction

The first section elaborates the situation of the elderly people in European Union. Based on documents, reports and statistics from f.in. Eurostat data base some clues about need for care, the Internet usage, heath situation were described. It gives an overview of the general situation of the Elderly people in EU, pointing to the unprecedented growth of the elderly population. Many actions and initiatives have already been taken up to secure the future of the 65+ in term of their quality of life and caregiving they may need.
The conclusion arising from the brief picture on the situation of the elderly highlights the need for developing a more holistic design, that can both provide surveillance services to the elderly (and disabled persons) and keep them connected with their social environment. This part serves also as justification to the NITICS project.

Section 2: Project overview

The section gives an overview of the NITICS concept, its context and motivation that drives the work.
The main goal of the project is to help the seniors and disabled people stay self-sufficient and independent as long as possible. In order to complete this, the project aims at developing an integrated platform that enables the implementation and deployment of mobility services, more quickly and cost effectively. It basic services will include: localization of personal objects (keys, glasses, mobile, etc.), localization and movement pattern analysis of elderly and disabled people at their homes, which – integrated with body sensors will support both end-users and their caregivers and other assistants and a multimedia bi-directional platform to ease, stimulate and support daily activities. The next two parts of the summary present the findings from the two surveys

Section 3: Results after primary and secondary users surveys.

This is the main section in this report, divided into two parts describes the situation and need from two points of view. This section focuses on the analyses of the data which were gathered during the primary- and secondary-users survey. The results of the surveys elaborates main topics such as: demographic data, health conditions, self-sufficiency, delivery of care and assistance, social life, operating devices, needs etc. Moreover it presents how the surveys were carried out and what these surveys provided.

Part I: Primary users (senior citizens)

The information we were looking for in this part of the research could be divided into a few areas: demographic and material data, health condition, independence and care requirements, social life, and attitudes towards the Internet usage and various devices NITICS aims at introducing for improving the quality of life (sensors, monitors, cameras, etc.). These are Main findings:

- There were 154 respondents participating in the survey, age 60-92 (majority was 65), almost 60% of them are women.
- 2/3 of the respondents share the house/ flat with a spouse or a relative
- They make an average income and rate their living conditions as decent or good
- As many as 68% of the respondents reported some kind of permanent health complaints and 40% experience some kind of mobility issue
- Although more than half of the respondents are relatively self-sufficient in most of the activities, they would welcome some help in cooking, cleaning, and health related activities (especially men).
- Among those who claim they do not need help there are in fact only 25-30% of them to whom that help is available
- 53 of the seniors receive some irregular support (mainly from family members) and only 11 have a permanent dedicated caregiver. Almost everyone though, claim to have an “emergency person” in case they need.
- 77% of the elderly socialize on regular basis but they choose mobile over Facebook (internet in general) to stay in touch with other people.

- Touchscreen devices were rated the most difficult to use.
- 67% of the survey participants would agree to have an automatic lock installed, 72% would agree to a portable sensor (72%) and a fall-detecting sensor (69%). The most controversial features are video cameras at home (33%) and a screen used for gathering information and enabling communication.

To sum up this part the survey study it is worth highlighting that despite some health problems the seniors who were interviewed are quite self-sufficient and would like to maintain such situation as long as possible while living in their own houses. This is in line with other European studies on the elderly in which over 80% of respondents admit they would prefer to stay at home even if they need to receive a regular care. This clearly indicate that there is a widespread demand for such solutions as the one designed within NITICS project, which will help to fulfil the wish of the elderly to live and to be cared for at their own homes.

Part II: Secondary users (caregivers)

The aim of this part of the research was twofold. First, to complete the information of the elderly and their needs by asking the carers opinions and second – to find out how useful the NITICS services would be for them, and the companies specializing in health-care services. These are the main findings:

- There were 48 people participating in the survey, age 24-65, out of whom as many as 42 were women. Half of the caregivers are qualified and the other half has hands-on the job experience.
- The professional carers have more experience in terms of the number of patients they have taken care for, but the difference between the two groups becomes rather irrelevant when it comes to the length of time.
- 85% of the carers believe the elderly suffer from social isolation and this situation is quite discomforting for them (75%).
- Most of the carers find it easy to use technology devices, only tabled proved to be slightly more problematic.
- an automatic door lock and an automatic alarm system were rated as very useful (40 and 42 persons respectively)
- More formal carers are in favour of a portable device that would alert her/ him in case the clients need emergency, than informal. The difference might be explained by the fact that majority of informal carers live with the older person they care for (they are usually family members).
- Many caregivers believe that wearing a small box by their clients in order to get quick help might be also a good idea as well as using videos cameras installed in the patients' homes
- They have more positive attitudes towards sensors installed in kitchen, living room, bathroom. rather than small cameras.
- Both type of caregivers would expect some help from the system with reading books (38 respondents), reminders (34), health related issues (30) and errands (21).
- 30 caregivers say the system is needed for improving the quality of life for the elderly. Even more respondents (35) see the possibility to improve the efficiency of their work thanks to the employment of the system.

The main conclusion arising from this survey is that there is generally a very friendly attitude among the respondents towards the main idea of the projects. The caregivers see a great potential in the NITICS suggested solutions, not only in improving the elderly's quality of life but also in improving the carers' efficiency and relieving their duties. As the population of the elderly is growing, the shortage of the human carers and nurses will become more and more realistic. Therefore, developing such support systems as NITICS is a necessary step taken to secure the future of the people needing help in their daily lives.

Section 4: Main conclusions & recommendations

- There are more senior females and female carers than male. This is true not only for our research but in general. It is advisable to consider this aspect in the future design and marketing the system.
- Bothe groups have some difficulty operating touchscreen devices, therefore, adopting a TV screen/ mobile phone for some of the services might be a good idea.
- Health-related issues is the area in which both seniors and caregivers would expect some help. It might be worth considering to specify further, what exactly it is they need.
- The elderly are very sensitive to privacy issues, therefore, more attention should be paid to convincing the primary users that the system guarantees the inviolability of private and intimate spheres

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Abbreviations

AAL	Ambient Assisted Living
CMU	Central Management Unit
DoW	Description of Work
EC	European Commission
EU	European Union
GA	General Assembly
JP	Joint Programme
NITICS	Networked InfrasTructure for Innovative home Care Solutions
PC	Project Coordinator
WPx	Work Package x (x=1-6)

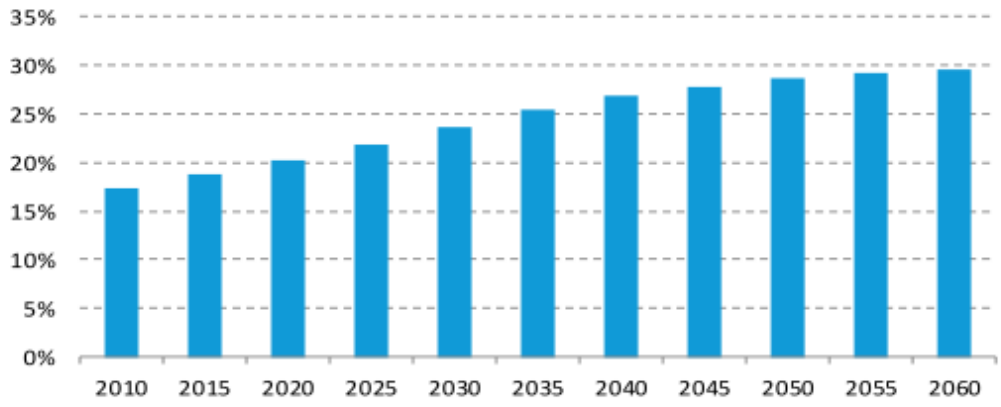
1 Introduction

The main goal of the Work Package 2 of the NITICS project was to designs end-user services based on end-user requirements which were to be elicit in a multinational survey among elderly, disabled individuals and caregivers. In order to obtain a general picture on the kind of services which could most effectively enhance end-user mobility a survey was conducted in five European countries: France, Switzerland, Romania, Poland and Slovenia (the report rest heavily on the data form the three later countries, but is complemented by the results obtained in France and Switzerland). This report present the main findings from two different surveys: one carried out among the primary-users (30-45 per country), that is elderly and disabled persons and the other conducted among secondary users, the care-givers (10-15 per country). Having extensive experience on user need elicitation and international survey studies, the consortium end-users has led the definition and implementation of the survey. The other participating organisations have contributed to the design of the survey and were responsible for conducting the survey in their countries.

The report stars with outlining the general situation of elderly in Europe. Then I moves on to presenting the main goals of the NITICS project. The next two parts discuss in details the findings from the two surveys carried out. The reports ends with pointing to the main conclusions and further recommendations.

1.1 The situation of the Elderly People

It is undeniable that the population of Europe and the whole world is getting older at an unprecedented rate. Some prognosis suggests that by 2050 the number of people over 60 will have grown by 10 times comparing to the situation in 1950s. (from 200 million in 1950 to the expected 2.1 billion). These are the prognosis towards European inhabitants over 65 form the Eurostat data.



Source: Eurostat (online data codes: demo_pjangroup, proj_10c2150p)

Figure 1: Trends in the 65+ as a share of the total EU-27 population, 2010-2060

Although the demographic shift is evident in all EU countries, in 2010 Germany recorded the highest proportion of seniors over 65 (20,7% as compared to France and Slovenia app. 17%, Romania 15% and Poland 13,3%), however, it is the Polish population that will age at a particularly rapid age compared with the other EU countries [1].

This situation is a result of a lowering birth rate (especially in developed countries) and increasing life expectancy, due to the improvement of medicine and changes in life-style (awareness of diet, sport, psychological wellbeing). This changes, however, pose a serious challenge to social policy, health system, economy and technology alike.

Today more and more countries have a more or less consistent policy towards the elderly, aimed at a specific community of people living in a specific time and place. Looking ahead, societies will need to consider how older citizens can obtain long-term care that provides the requested medical attention, while also keeping costs under control and catering to the widespread desire for independence over institutionalisation.

This part of the report focuses on outlining a more general background of the situation of the elderly in five areas, which relate to the topic we deal with in our survey: health, self-sufficiency, housing & material situation and the usage of IT technology.

1.2 Health & Life expectancy

The development of medical care, diet, life style and working conditions have improved dramatically the health condition of people in general. Never before life expectancy has been so high. And the studies shows that it will continue to increase. For example, it is estimated that by 2060 every second new-born boy and girl will live up to the age of 87 and 91 respectively! Therefore, we can argue that older people will play a decisive role in shaping the future society. But the action has to be taken now and the NITICS project aims at facing that future.

We generally live longer than ever, but that doesn't necessarily mean that the older generation feels fitter with age. On the contrary - the proportion of people in the EU who felt that their health has deteriorated increases from 19% among those aged 65-74 to 30% among 75-84 year old and to 37% for those over 85.

Subjective assessment of health condition by age

	65-74	75-84	85+
Very good	40	27	24
Satisfactory	41	43	39
Bad/ very bad	19	30	37

Source: *Older People in Germany and EU.*

When we look and the causes of death among those over 65 in the 27 EU countries it is striking that ischaemic (coronary) diseases, which leads to heart attacks, make for the most common causes of death. in the EU in 2008, heart attacks, strokes and other heart diseases were responsible for 41% of all deaths amongst people between 65 and 84 years of age. Those countries which have the highest rates of death caused by heart attracts include Slovakia and Lithuania, Czech Republic, Latvia, Hungary and Romania. Although family history play some role in developing the symptoms, other factors such as smoking, obesity and lack of exercise – which can be controlled and changed – are no less important. This suggests that awareness and education are essential to lower the number of heart attacks. Also, modern technology allows for providing better and faster help in case of a stroke and time is absolutely crucial in these moment. The NITICS project also has these aspects in mind.

The second most common cause of death among older people is cancer (all types in total) which accounts for 30% of deaths among people aged 65-84 and the third - respiratory diseases, such as lung tumours, asthma, bronchitis. The proportion of older people who lost their lives due to external circumstances, such as accident or fall, amounted to less than 3% in the EU in 2008. Approximately 31,000 people aged 65 years and over died in the EU as a result of falling. This data clearly indicates that more attention should be drawn to prevention of illnesses, also by providing the elderlies with innovative equipment and devices to control their health condition on regular basis.

Country	Ischaemic heart disease (total)	Cerebrovascular diseases (total)	Respiratory diseases (total)	Lung cancer (total)	Colorectal cancer (total)	Breast cancer (females)	Prostate cancer (males)
EU27	568.8	397.4	326.0	201.2	120.4	102.4	167.3
EU15	463.7	316.7	334.4	197.2	114.3	104.1	166.2
BE	480.7	340.0	541.6	244.8	121.9	124.1	190.1
BG	755.6	1 310.2	204.8	137.7	126.8	87.5	133.8
CZ	1 308.3	640.4	299.3	219.8	173.4	102.1	186.0
DK	453.2	315.1	524.1	290.0	157.8	151.8	267.6
DE	632.5	297.3	299.8	178.9	117.4	112.7	162.5
EE	1 535.9	485.2	129.2	188.1	133.9	92.2	301.6
IE	759.0	324.2	583.0	247.4	132.5	133.6	220.7
EL	379.3	611.2	416.1	211.6	85.6	103.7	141.5
ES	317.7	284.7	395.9	180.0	128.6	74.0	139.9
FR	235.8	208.0	209.8	165.2	107.9	103.5	169.3
IT	455.1	388.7	232.3	209.1	110.8	103.7	129.4
CY	458.4	301.4	311.7	144.5	64.2	88.4	143.3
LV	1 734.0	977.5	86.2	182.2	136.5	91.6	262.7
LT	2 250.2	895.8	197.9	178.1	142.3	93.1	241.1
LU	314.2	376.9	331.6	222.7	138.4	123.5	202.3
HU	1 523.9	666.4	273.3	273.9	207.1	117.0	171.0
MT	905.0	485.7	428.6	177.4	113.7	142.1	122.4
NL	306.1	266.9	426.3	267.8	135.8	119.5	207.8
AT	749.4	263.2	216.2	160.8	105.6	113.8	174.3
PL	660.3	516.4	287.3	260.9	139.0	82.9	177.5
PT	304.7	598.4	510.9	119.7	138.5	79.3	195.0
RO	1 317.7	1 276.5	260.9	169.5	114.7	88.8	122.9
SI	444.9	531.2	318.0	204.2	171.7	134.3	281.8
SK	2 072.4	715.0	338.1	188.7	181.9	100.9	186.2
FI	934.0	354.0	178.5	155.8	86.9	83.8	188.9
SE	639.0	325.7	239.1	155.0	113.7	84.0	271.3
UK	569.6	343.8	539.6	256.1	109.3	113.1	196.1
IS	666.1	302.6	339.1	238.6	116.5	115.5	259.3
NO	492.2	310.9	391.1	199.5	144.0	90.4	277.5
CH	506.3	233.7	215.4	161.1	96.1	106.5	205.9
HR	1 183.6	897.8	252.3	233.5	186.9	127.6	236.5
MK	564.8	1 442.9	240.4	186.6	113.4	103.1	138.2

BE: 2005; CH: 2007; FR, IT: 2008

Source: Eurostat

Figure 2: Major causes of death at national level for 65plus years, SDR per 100 000 inhabitants, 2009

1.3 Need for care

According to the OECD in Western Europe 10-20% of the population over 65 requires taking care. As the situation – both material and social of the elderlies is comparably worst in the countries of Easter Europe it seems valid to claim that the number would be even higher. It is clear that the older a person get the more likely he/ she is to need some sort of help due to simple frailty or more serious conditions such as dementia.

Long term care is required by those persons who – due to an illness or disability – are permanently in need of help to a substantial or greater degree. The increased number of older people influence the growing number of those who are in need of long or short-term care, and it is predicted that the number will keep rising in the future. This trend is visible in each of the EU countries. In the group aged 65-74 there is no difference between the number of men and women needing help, only after the age of 75 women tend to need long-term care more often than men. One of the reason for this situation might be that elderly women often than men live alone, whereas men in this age category, when needing help, are usually cared for by their spouses and/ or other relatives.

The statistics show that more than 2/3 of those who need care receive in-home services rather than in specialized institutions. Because of the growing needs for care services there is a slow but steadily growing trend for professional nursing services aimed at senior citizens. It is observable, for example, through the number of graduates in this field. However, due to the aging of the population soon the caregiving staff will start experiencing serious shortages, there will be fewer people able to provide such care. And this is the place where technology might and should step in.

Most countries addressing the problem of care for seniors are focusing rather on ways to improve provision of home care than invest funds in institutional care, which is much cheaper and also this type of provision seems to be favourable among the receivers of help as well as the family members who provide help. Improving the system effectively requires however a comprehensive strategy, which will include the formal regulations as to the allowances for cares (family members act usually as unpaid labour) as well as employment of new technology solutions. LTC services are increasingly being delivered in care recipients' homes. Studies show that most people prefer to be nursed at their own homes as long as it is possible. In 2010, over 8% of people aged 65 years old and over received care at home while less than 4% of them received care in institutions.

1.4 Internet usage

Recently the usage of new technologies among the group of 60+ has become a subject of many research projects. It is still undeniable, however, that the age criteria is the main feature differentiating the usage of the Internet [2]. Yet the proportion of people over 45 using the Internet is still growing. In 2005, 22% of people age 45-59 were using the Internet, four years later the number grew to 39,5%. For people aged 60-64 the numbers are 7,6% and 20,6 respectively. Such a considerable growth cannot be explained as a result of a simple shift of the younger generation to the older one. Although age is still the main cause of digital exclusion the statistical data shows that we are witnessing ever so growing "internetization" of elder users [3]. In 2010 28% of all EU population age 65-74 used the Internet. There is however, a huge gap between the Northern and the Southern part of Europe. In Denmark, Netherlands, Sweden and Luxemburg more than 50% of people form the same age group used the Internet. On the other hand, in Greece, Romania and Bulgaria the number of Internet users is less than 5%.

The bigger difference though between the younger Internet users (up to 40 year old) and the older ones (over 60) can be observed in the way they use the Internet. Using emails and finding information about news and services are still the most popular activities in this age group, even more than seeking health information. Social contacts are preferred to be maintained face-to-face. However, the situations is seems to be changing quickly. Recent American study shows that the number of Social Media users age 65+ has grown from 13% in spring 2009 to 43% in 2013. Only Twitter does still attract a younger generations[4].

Among those who still do not have access to the Internet the co called 'hard' barriers such as lack of appropriate equipment, financial limitations or lack of access to broadband connection are much less of an obstacle than it was a few years ago. Instead, the so called 'soft' barriers, like lack of skills and motivations - are coming into play.

It is estimated, however, that the future older generations will have been used to computers and new technologies in general so it is justified to say that the elderly will use technology far more than today's seniors. This is also illustrated by the table below which shows that the daily usage of the Internet among those over 65 has grown by 3,4 in five years.

	Total population		Aged 55-64		Aged 65-74	
	2005	2010	2005	2010	2005	2010
Frequency of use: at least once a week	43	65	26	46	10	25
Frequency of use: daily	29	53	17	36	5	17
Used Internet in the last 3 months:						
for any training and education related purposes	:	39	:	22	:	10
for looking for information about education, training or course offers	:	23	:	10	:	3
to do an online course (of any subject)	:	4	:	2	:	1
reading/downloading online newspapers/news	17	34	10	24	3	14
to subscribe to news services or products to receive them regularly	:	6	:	4	:	2
seeking health information	16	34	11	26	5	15
sending/receiving e-mails	42	61	26	43	10	24
playing/downloading games, images, films or music	16	28	4	11	1	6
finding information about goods and services	39	56	24	40	9	22
job search or sending an application	10	15	2	4		
downloading software	13	21	7	11	3	6
telephoning or video calls	:	19	:	10	:	5
listening to web radios and/or watching web TV	10	26	3	13	1	6
uploading self-created content to any website to be shared	:	22	:	10	:	5
posting messages to social media sites or instant messaging	:	32	:	10	:	4

Source: Eurostat (online data code: isoc_bde15cua)

Figure 3: Internet use and activities carried out by individuals, by age group, EU-27 (% of individuals)

1.5 Summary

Taking into account the changes in demographic landscape of society it is clear that there will be a growing need for more professionals specialising in geriatric area. However for the last decade or so, other strategies have been developed to support the needs of aging population, including the use of technical solutions. There have been more and more funds spent on research and development on innovations to assist older people at their homes and in specialized institutions. In Japan, for example. Nurse robots are being created to help elderly in moving around home and basic care. Similarly, the UK's project carried out at Warwick University aims at building a robot, that will not so much replace a human nurse but will perform such functions as house chores or monitoring of hallways. In other words, a range of innovations is being carried out , often lumped together under a term "telemedicine" to allow healthcare professionals to monitor and assess the health and needs of individuals transmitted by phone or Internet.

The NITICS project also ascribe to such attempts by trying to design various equipment (home and personal) aimed at increasing the safety of elderlies as well as disabled people so that they can have their needs met at home while staying independent. A more detailed description of the project follows.

2 Project overview

The Networked Infrastructure for Innovative Home Care Solutions (NITICS) project is part of the Ambient Assisted Living Joint Programme (AAL JP) aimed at enabling older and disabled people to stay self-sufficient and independent. As it was pointed out above, there are already a number of surveillance and navigation solutions developed to support elderly in their daily activities, however, there is still a lack of more holistic design that can both provide surveillance services and keep them connected with their social environment. NITICS addresses these needs.

The aim of the NITICS is to develop an integrated platform that enables the implementation and deployment of mobility services for those who need them more quickly and cost effectively. It basic services will include: localization of personal objects (keys, glasses, mobile, etc.), localization and movement pattern analysis of elderly and disabled people at their homes, which – integrated with body sensors will support both end-users and their caregivers and other assistants and a multimedia bi-directional platform to ease, stimulate and support daily activities.

NITICS aims at targeting the following goals:

Defining and designing a flexible service platform allowing and facilitating the integration and consolidation of existing elements, leading to a continuous improvement and extension of end-user services. NITICS also provides opportunities to design new customized services to better take care about the end-user.

Improving the quality of life of elderly and disabled persons, by allowing them to be mobile in a safe way inside the house and sustain them supporting in their daily life activities;

Improving self-sufficiency of elderly and disabled persons, by self-caring at home (self-check of health conditions and life-style, medication reminder, nutrition status monitoring and alerting), in order to avoid excessive workload and cost from the involved carers.

Improving the response in terms of efficiency (quality and speed) from the care providers and from the individual's family in emergency situations, by an alarming system, by sensors/cameras feedback to carers, by remotely controlling devices and by video conversations with carers;

Providing care in an efficient way, by making use of reliable information on the condition of the elderly, which will indicate whether an informal carer is needed for aid or if a more specialized formal carer has to intervene.

Increasing end-users/carers interaction and collaboration, by e-learning and tutorials to carers (both formal and informal) and to primary end-users.

Ensuring privacy and safety of personal data, by embedding state-of-the-art computer science security and cryptography.

Ensuring system's continuity, resources saving (e.g. electricity, water consumption, food and goods in general) and energy harvesting systems, for minimal environmental impact and in compliance with existing quality standards as well as European and local laws and regulations.

Last but not least, NITICS strives to provide both end-users and caregivers opportunity to actively participate in social networks services in order to stimulate and preserve the cognitive abilities of people with diseases or disabilities.

As detailed in [5], the Networked Infrastructure for Innovative home Care Solutions project addresses precisely aspects that are related to the Ambient Assisted Living Joint Programme (AAL JP) Call 5 by designing and building a holistic platform that is expandable and offering advanced ICT services including monitoring and navigational support that are needed to support the mobility of elderly and disabled persons in their home during their daily activities. NITICS also brings in several suitable services for elderly and people with diseases or disabilities (mobility handicaps, cognitive disabilities and mental diseases).

The NITICS framework will provide major benefits to the end-users but will also provide benefits to caretakers and people directly involved in the care value chain. Furthermore, we believe that additional alternative, innovative service concepts will emerge during the project, allowing increasing the use of the platform, bearing in mind the objective of a better life style at home.

The NITICS concept and fields of application are illustrated Figure 44.

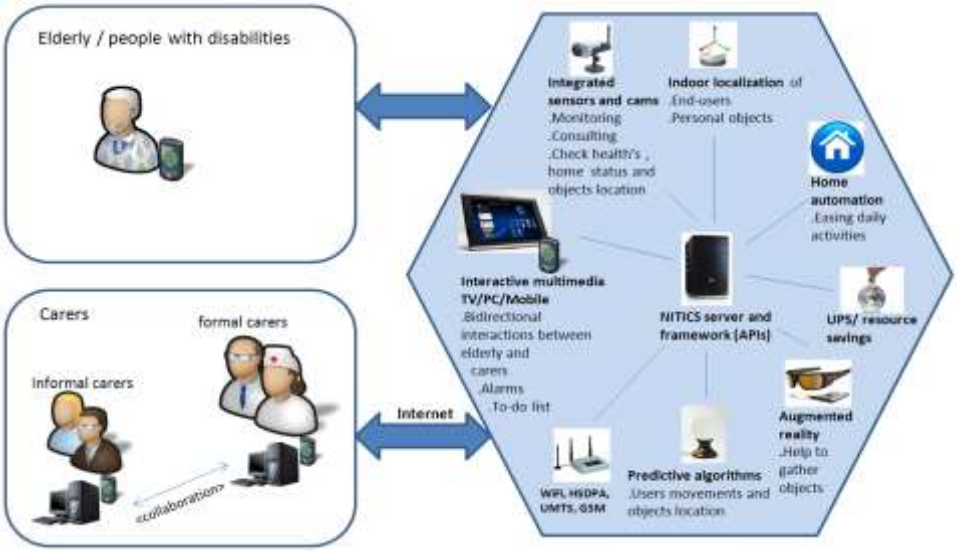


Figure 4: NITICS system's architecture / functional scenarios

3 Part I: Primary users

3.1 Methodology

In order to identify and record the most relevant user information, relevant for the system development a questionnaire was designed in such a way as to obtain quantitative data. Quantitative technics do not neglect the subjective preferences of the users, but they rather strive to standardize the collection instrument (the questionnaire-based interview) which enables compering the results and drawing broader conclusion (the larger the sample used in a survey the more justified are the conclusions). The questionnaire included

closed questions to elicit quantitative data on such topics as living arrangements, caregiving status, financial status, health status, IT usage and attitudes,

open questions to encourage some deeper insight and freedom of expression.

The questionnaire was translated into the native languages of the participating countries and then carried out in three countries Poland (44 respondents), Romania (61) and Slovenia (33). This formed a based of the findings and conclusions included in the report. Additionally, there have been 10 questionnaire completed in France and 6 in Switzerland, however because the data is scattered and incomplete in places (lack of answers form French interviewees to some of the question) the information received form the latter two countries used only to complete the main findings.

It has to be stressed though, that the research sample was rather small and was not representative in any of the countries the survey was completed. This means that the results, although rich and interesting cannot be extrapolated on the whole population of the elderly/ disabled in a given country.

3.2 Procedure

The survey was carried out using the empirical methods and took the form of either CAPI (Computer Assisted Personal Interviews) or PAPI (Paper And Pencil Interview) interview.

During the survey interviewer was informed to raise an issue about telecare and receive information if elderly people agree to be investigated (Before taking part the participants should sign the consent for participation and personal data processing). Each interview took 25-40 min. on average and it started out with a short presentation of the main idea of the project with the aid of some graphic representations (5-10 min). All the answers were transferred into the MS Excel sheet and then analysed using the SPSS software.

3.3 Canvassing of interviewees

France

The elderly people already connected to visage system; the respondents are the habitants of the village.

Poland

Through associations which have contact with the elderly people, run ICT courses for them, etc.;

Parents and Grandparents of our friends living in Cracow and Warsaw.

Romania

The identification of the participants was made by pooling together contacts from the districts' Retired Citizens Associations, professional (mainly medical) and personal contacts;

The participants came from two main cities in Romania (Bucharest and Cluj-Napoca) and from a rural region in the north-eastern part (Vama);

92 % of the interviews took place using CITST's designated interviewers who recorded the responses on the interview sheets.

Slovenia

Through Associations which have contact with the elderly, support groups for elderly, etc (Inštitut Antona Trstenjaka, Ljubljana) ; friends and their family members (parents and grandparents)

Switzerland

Parents and Grandparents in Ticino (Italian Part of Switzerland)

Telesoccorso Ticino (rescue service and caregiving association of Southern Switzerland)

Profile of primary users

Gender: male or female

Age: 60+ and Work status: retired OR Disabled: yes

Country: Poland, Romania, Slovenia, France, Switzerland

Place of living: city

Number of flatmates: max 2

ICT skills: not applicable

Education level: not applicable

Occupancy status: not applicable

The scope of guidelines

The guidelines refer to the research in WP 2.1. Within the scope of guidelines are the following:

CAPI or PAPI interviews with end-users (4 x 30-45 people)

Desk research – data collection for the study about the profile of the elderly and disabled people

Scientific description and report of the collected data

Questionnaire and research

5 groups of end users were interviewed in 5 countries: France, Poland, Romania, Slovenia, Switzerland.

15% to 20% of respondents should be the disabled ones (the remaining ones are the elderly)

Questionnaire for primary users will include the following issues:

Instructions and recommendations

Demographic data

Living arrangements

Caregiving status

Financial status

Health status

Estimation of need for assistance

Socializing (social relations)

Security concerns

Emergency assistance/support

Request for participation in further part of the research

Technology acceptance

Privacy issues

Timeline

Tue, August 13th morning	Final version of the primary end-user questionnaire.
Wed, August 14th evening	Translation of the primary end-user questionnaire.
Fri, August 30th	Draft of the secondary end-user questionnaire.

Mon, September 16th	Final version of the secondary end-user questionnaire, also based on input collected from the first interviews of primary users.
Mon, September 30th	End of collection of the primary end-users survey data.
Tue, October 15th	End of the evaluation

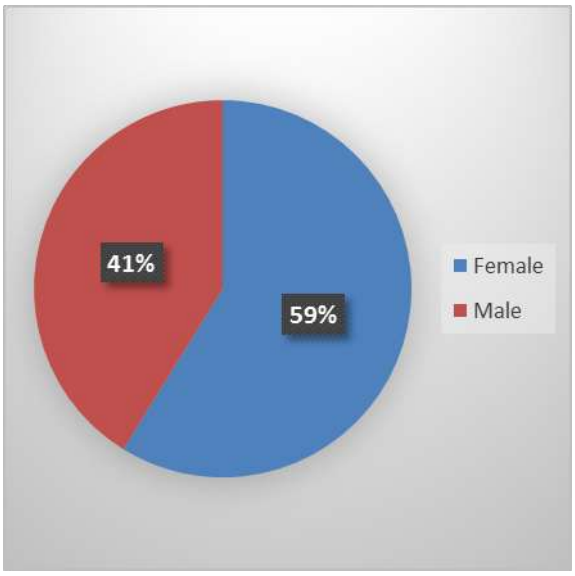
4 Research results

Having in mind the issues of aging societies NITICS project was designed in order to meet the needs of the elderly in the health care system and possibly – the social communication. From the three areas of activities aimed at the issues of aging – policy towards demographic aging, policy towards old age, and policy towards old people [6] - it ascribes to the last one.

Quality of life relates to long-term care recipients' ability to live at their highest mental, physical and emotional and social potential. Part of the questionnaire used in the research focused on these aspect. The information we were looking were could be divided into a few areas: demographic and material data, health condition, independence and care requirements, social life, and attitudes towards the Internet usage and various devices NITICS aims at introducing for improving the quality of life (sensors, monitors, cameras, etc.). Below the finding are presented in similar order

4.1 Demographic data & material status

The research was carried out in five countries among those over 60 year old, which was an initial prerequisite to participate in the study. The total number of respondents was 154 people, age 60-92 and although the age variable was rather evenly distributed the group which was only slightly bigger than other age groups was the one of 65 year olds (17 respondents). The average age was 73.



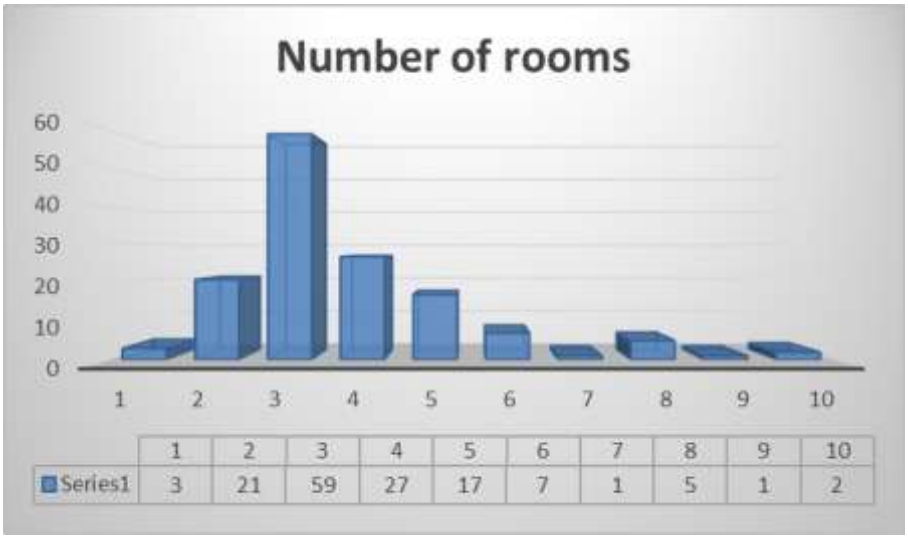
Women respondents consisted of the majority of all the interviewees (90 women comparing to 63 men), which is quite characteristic feature of a demographic situation of those over 65 years old due to a longer life expectancy among women in these age group. In 2012 there were over 40% more women than men among the EU population of 65+, however, the ratio rose to over 100% in such Baltic countries as Latvia (208 women per 100 men) or Estonia (204).

Source: based on data from NITICS survey

Figure 5: Participation by gender

This might be a valuable information for further analysis, considering that – on one hand - the younger representatives of the research are usually better skilled in operating new technology equipment (a PC, laptop, tablet, Smartphone), but on the other – they are still quite fit and self-sufficient just yet. That means that there is still some time to design and produce the best solutions within the NITICS project in order to meet the future needs of this group.

The great majority of the elderlies live in a city, which also needs to be taken into consideration when looking at the results. There are no big differences in the number of people living in a home or a flat. Roughly half of the respondents live at home (75 people) and half of them in an apartment (78) occupying between 2-5 rooms.

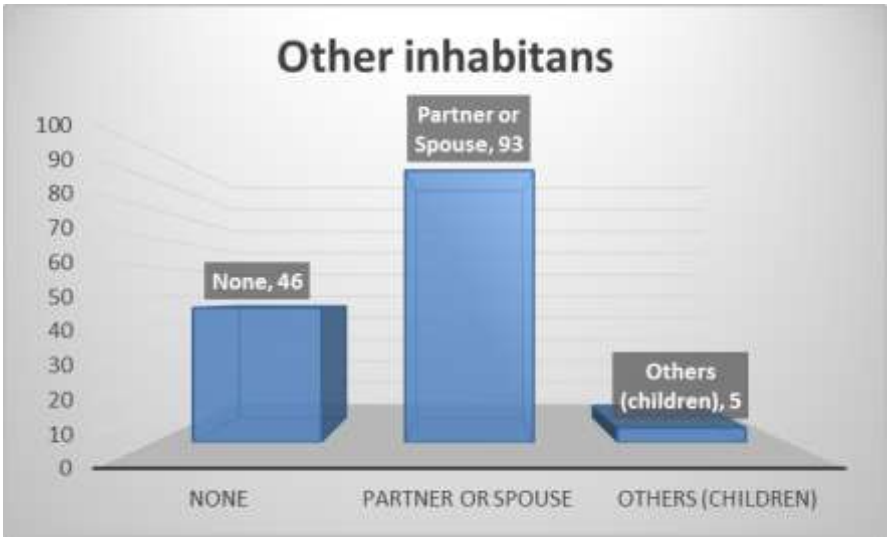


Source: based on data from NITICS survey

Figure 6: Number of rooms

60% of those participating in the questionnaire share the space with a spouse or a partner. This is visibly more than the average in the EU countries. In 2010, 48% of seniors over 65 were living with their partner. However, this living pattern is negatively correlated with life expectancy: in Latvia for example, only 27% of those over 65 live as couple. Older women are less often married and more often widowed than men of the same age.

30% of the research participants live alone (similarly to 31% in EU, mostly women), and further 64% live with either a child/children or other adult person (unspecified). Another European study show that most people would prefer to still live at home as they get older.



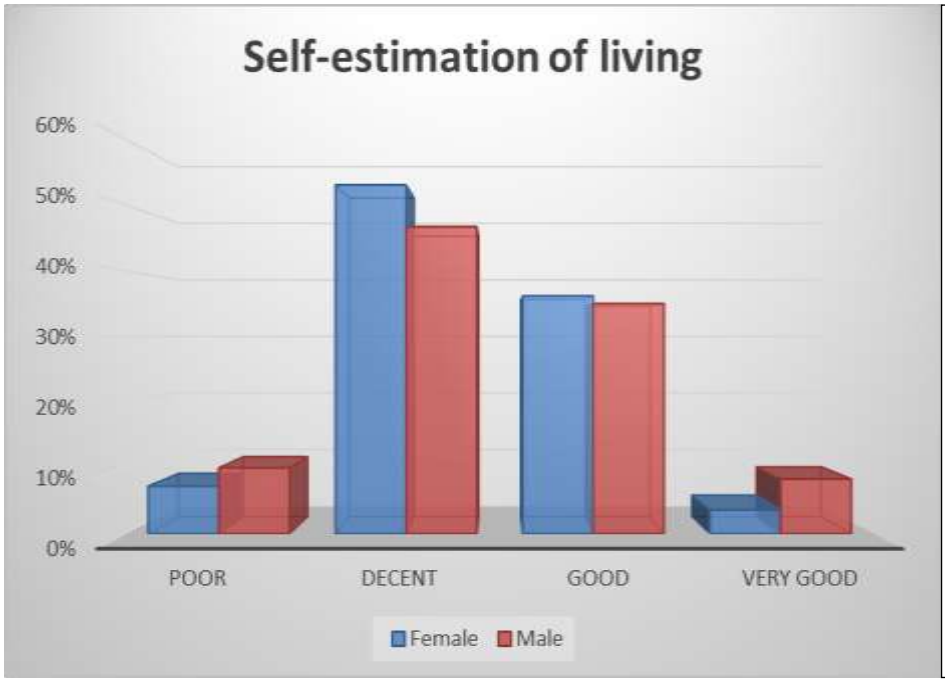
Source: based on data from NITICS survey

Figure 7: Other inhabitants

The monthly income of the seniors differ between the countries. All in all, the largest number of respondents (43%) receive around 500-1000 Euro per month. This seems to be an average pension for seniors in both Poland and Rumania. Interestingly enough, despite many similarities between the three countries (in term on economy) Slovenian's seniors are much better off financially. Most of them claim to have an income of over 1,5 thousand Euro per month and quite a few of even over 2000. Almost the same number of people

admitted to having either the lowest or the highest (on the scale used) income (11 and 13 people respectively).

Income, however, is one of the most sensitive questions asked in questionnaires. Studies have shown that often interviewees may feel embarrassed talking about their low financial situation, which in turn leads to upgrading it and obscuring the real picture. Therefor it is advisable to treat this data with a pinch of scepticism. From the results obtained during the course of the questionnaire it can be said that the group of the respondents represents the average for the studied populations in terms of living standards. So the elderlies from Poland and Romania are visibly disadvantaged in comparison to those of France and Switzerland, which is in line with the general economic discrepancies between Western and Eastern part of Europe. Although living conditions in the East have converged to a certain extend 20 years after the collapse of the socialist economic system, specific consumer durables such as a dishwasher or a car, which have long been taken for granted in western countries are by no means standard in Central and Eastern European countries. These discrepancies between countries are also reflected in the consumption expenditure. In most of the Central and Easter European countries the pensioners spend a very large proportion of their income (over 80%) on basic needs, such as food and housing (the average spending for food & housing in the 27 EU countries is just 58%) and only 5% on recreation and cultural activities (comparing to the average 12% in EU).



The level of income among the elderlies is reflected in their self-estimation of the living conditions. 43% of them make an average income and almost the same number (50%) rate their living standards as decent. 36% see their situation as good, 6% as very good, and 8% (12 people) as poor. We can assume then, that despite the saying "you can't buy happiness", money plays an important role in assessing the standards of living.

Source: based on data from NITICS survey

Figure 8: Self-estimation of living

There are no big differences between the general satisfaction from the living conditions between man and women. Slightly more women describe their situation as decent and good than man, but in the two extreme responses (poor and very good) the number of men outweighs the number of women. As many as 11% of male respondents described their situation as very good, compared to only 3% of female interviewees.

4.2 Health conditions

As many as 68% of the respondents reported some kind of permanent health complaints. Commonly for an older age, many people suffer from visual and hearing deficiencies as well as problem with high blood pressure, which is also connected with ageing. Other often mention problems included: rheumatism, osteoporosis (and general problems with bone/ joins degeneration) and high cholesterol. Many Romanian respondents complained about some sort of cardiovascular problems, such as ischemic cardiomyopathy and

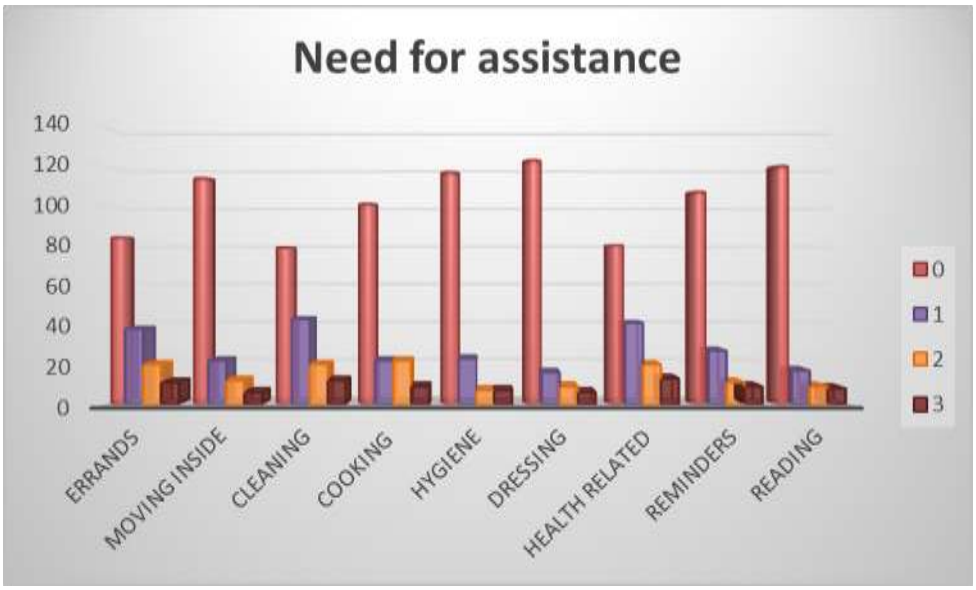
arterial hypertension. This is in line with the general health statistics for the elderly in Europe, which show that Romania is one of the few European countries with the highest death rate caused by coronary diseases.

17% of the interviewees pointed to more than one health problems, and eight of them, to more than two (mainly in Romania and Slovenia). It is possible though, that the number of reported diseases was dependent on how interviews were conducted and the very question asked. Both in Poland and in Switzerland respondents indicated to only one medical problem and it is very unlikely that the seniors in these particular countries face less health problems than the others.

40 % of the people we interviewed admit to having some kind of mobility issue. For the majority the problem is slightly or moderately impending everyday activities (39 people). 18 people describe the problem as severe and in five cases it is so harsh that immobilizes the respondents. Despite this and other medical conditions mentioned above, the interviewees rate their general health conditions surprisingly well. 60% of them dubbed it as “rather good” (12 people as very good) and only 21% as rather bad. Age, as it seems, was not the main factor influencing the assessment of health condition, but rather the mobility and chronic illnesses (five people – all of them with serious mobility problems – rated their condition as “very bad”).

4.3 Self-sufficiency

Another way to check the wellbeing of the respondents is looking at the level of self-sufficiency and independence in everyday activities. In order to obtain this information a self-sufficiency index was designed. Each interviewee was asked to assess to what extend he/ she needs help in nine daily activities, such as: cleaning, cooking, dressing, household errands, personal hygiene, moving around house, reading, reminders and health related (ie. supervised gym). The need for help in each of the activities were to be assessed on the scale 0- none to 3- essential.



Source: based on data from NITICS survey

Figure 9: Need for assistance

As a result four categories were applied (based on data from respondents who answered to all subpoints in the question).:

Heavy dependency: 7 people falling into this category,

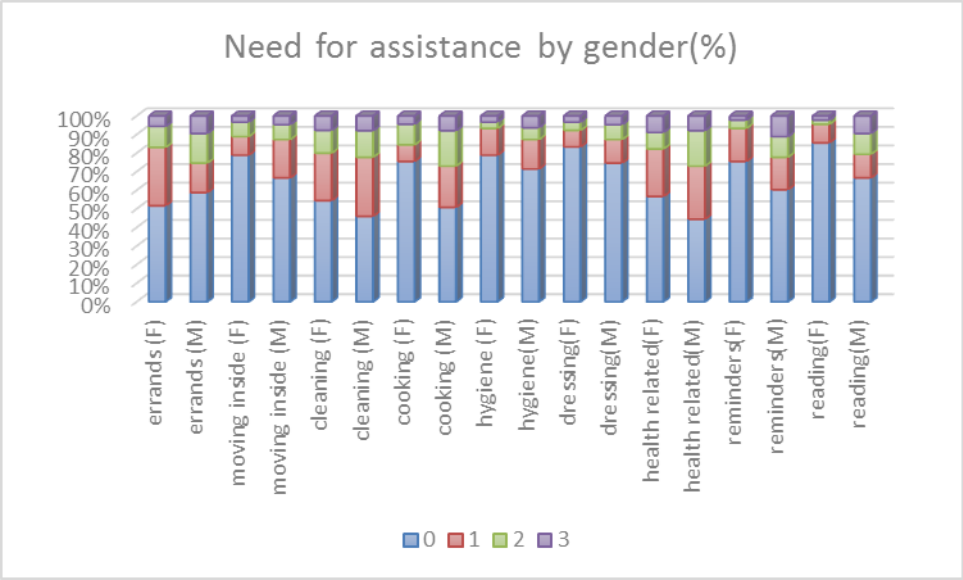
Low self-sufficiency: 10 respondents

Medium self-sufficiency: 18 respondents

High self-sufficiency: 72 respondents (47%)

The first question in this part of the questionnaire tested if there was a relation between age and the level of self-sufficiency. And indeed, the analysis of the statistical data proved that the older a respondent is the less independent he or she becomes. There is also some correlation between the variable measured and a general health condition but it is not as strong as the age factor.

Among those few who do need some sort of help, such activities as cleaning, cooking, household errands and health related were mentioned as those they would need a hand with. In a few cases respondents also pointed to other activities, not listed in the questionnaire, such as driving (2 people), gardening (one person), Internet usage (one person) and legal matters, such as taxes (one person). The men need slightly more help than women in the majority of the activities, but cleaning, cooking, reading and health related are at the top. Only in errands do female respondents prevail in needing assistance.



Source: based on data from NITICS survey. 0-not at all, 1-slightly, 2-very, 3-essential

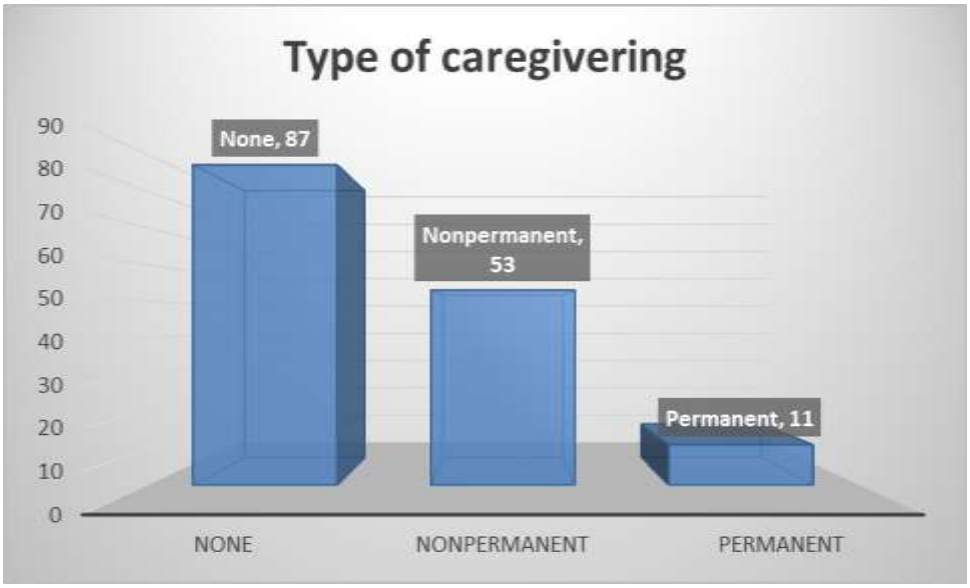
Figure 10: Need for assistance by gender (%)

Another culturally-related observation: very few people admitted to needing help in Romania and Slovenia, contrary to Poland and France. Again - the question arise if such results indicate the respondents are in a decent shape and therefore, they do not need much help (doubtful, taking into account a rather poor health condition of Romanians) or, perhaps, they are too proud to ask for help? Unfortunately we were not able to test such subtle matters by using a standardised questionnaire.

To sum up, the elderlies that were interviewed are generally very independent and self-sufficient in everyday life, who do not need (at least not in the moment) much assistance around the house. That was further confirmed by the question aimed at determining whether caregiving was delivered to them or not.

4.4 Delivery of care and assistance

In the light of the results on high self-sufficiency, it will not be surprising to find out that 87 people (57%) we asked said they do not receive any kind of care/ help, and do not need such help. 53 respondents (34%) receive irregular and non-specialized care and only 11 of them have a permanent caregiver, out of whom only five are qualified and – interestingly – all of the five cases come from Poland.



Source: based on data from NITICS survey

Figure 11: Type of caregiving

among those who claim they do not need help there are in fact only 25-30% of them to whom that help is available

On the other hand, only two people out of 43, receive any kind of care in Slovenia (to compare: in Rumania – over 50% of the elderlies use some kind of caregiving, in Poland 38%, in France, 7 out of the nine respondents).

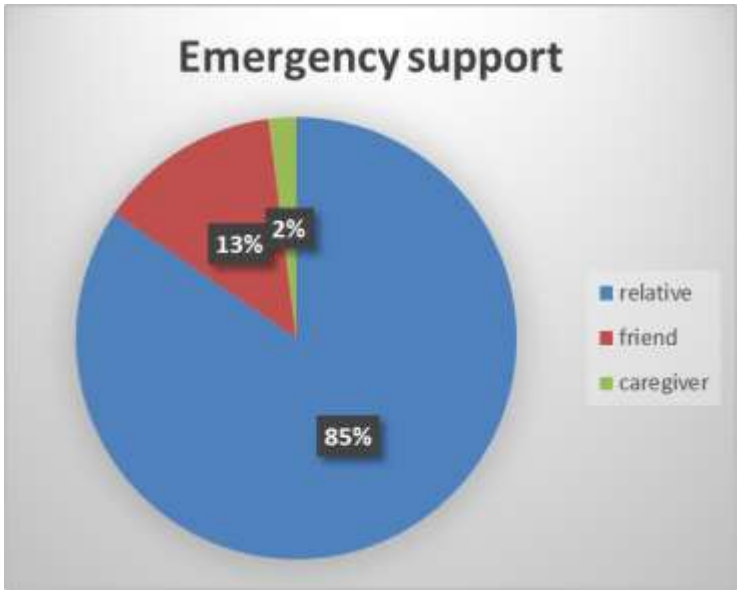
Therefore, we asked further about the availability of help and assistance in relation to the same activities. The results show that only to a small extend the help is available but the majority of respondents cannot count on any sort of help even with simple basic activities. Let's have a look at the graph below presenting the two most common answers to questions about the need for help in certain areas (Q22) and the potential availability of this help (Q23).

Source: based on data from NITICS survey

Figure 12: Need for help vs. availability

As we can see, for each of the activities measured, the pattern is the same: among those who claim they do not need help there are in fact only 25-30% of them to whom that help is available. This cluster of people might be treated as really independent and self-sufficient. In the case of the other 70-75% respondents, apparently the help is not needed, but - even if it was, it is not immediately available. This situation raises a question whether or not the answers given by the seniors would be the same if the help was easily available to them?

One of the most influential psychological theory on *cognitive dissonance* shows that people tend to adjust their opinions and attitudes to their psychological needs rather than rational objective circumstances. For example: smoking while knowing it is fatal, may cause some unpleasant cognitive dissonance. In order to lower this feeling a smoker may look for "evidence" to prove otherwise, such as examples of people who live long despite smoking. In other words, these respondents to whom the help is not available "adjust" their needs to this situation (in order to lower their cognitive dissonance) by saying (and believing) that they do not need help.



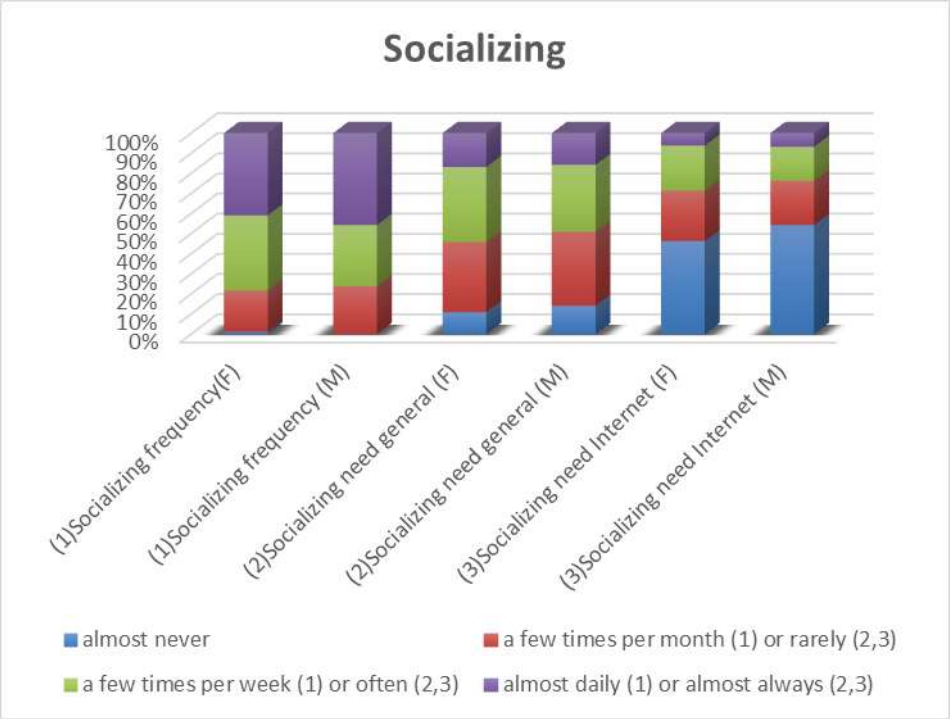
On the other hand, a great majority of seniors admit to having a person they can rely on in case of emergency (96%), which may significantly increase the feeling of safety. Invariably, in 85% of the cases it is a relative, mainly a spouse/ partner or a child. For the rest of the respondents it is a friend, and only in three cases a dedicated caregiver.

Source: based on data from NITICS survey

Figure 13: Emergency support

4.5 Social life

It is generally believed that the older one gets the less inclined he or she is to maintain an intensive social life, looking rather look for peace and quiet. However, the data from our research does not confirm that theory. 77% of the participants socialise on daily basis or a few times a week and 22% meet other people several times a month. Only one person (a woman with severe mobility problem) said she hardly ever socializes.



Source: based on data from NITICS survey

Figure 14: Socializing

One aspect has to be considered here. The great majority of the respondents live in big towns or cities. Various studies have shown that almost by definition, those over 65 are much more active than their counterparts living in the countryside. This simply may result not from the lack of willingness but from the fact that there is much greater offer addressed to the city seniors than the village ones. In Poland, for example The Universities of the Third Age have proven to be a huge success. Additionally there are various seniors' clubs, travel initiatives and charities, in which older people, especially women, very often volunteer. In other words, the life style in urban areas is quite different form the one in the countryside. Such discrepancies may be lower in the western countries of EU but in the Central and Eastern parts are still quite significant.

In order to describe the researched group in terms of social contacts, a socialisation index was created to measure willingness of the respondents to get in touch with others through personal contact or through the Internet (mediated contact). According to this variable the group was divided into three categories.

- The largest one was composed of those respondents (98 people in total) who show **medium willingness** to social contacts, that account for 68%. The average age in this category is 73 year old and there are twice as many female respondents as male. Most of the medium-willing socialisers rate their health as good and half of them gained the highest index of self-sufficiency on our scale. They also represent an average, for the whole group, IT skills, obtaining 11 points on average (measured on a scale 0-21).

- The group **most willing** to stay in touch with other people (eager socialisers) is composed of 32 respondents (22%) and the average age in this category is 74,3 - even higher that in the medium-socialisers. This data challenge the general presumption that the social activity drops down with age. There is not much difference between gender here; there are only few more women than men in this category. Similarly to the previous group, the general health condition is rather good but it is difficult to assess the level of IT skills of the participants as there is a large number of missing answers to the question about technology literacy.

- The third category can be called **unwilling socialisers**. There are 19 people (13%) in the unwilling socialisers category, slightly more men than women. The general health condition differ across the

group, on the continuum from very bad to very good. Similarly to the eager socialisers the IT skills were lower than average and there were many missed answers.

When asked if the respondents would enjoy staying in touch with others via the Internet (Facebook, etc.) 53% of them said no and 25% - rarely. Only 21% would often socialize on the net and as little as 6% are actually enjoying it. Unfortunately most of the seniors did not give any details on why they would not see themselves contacting others online and those few who did, pointed mainly to the lack of interests and appropriate skills. These are so called the soft barriers, which, as it was mentioned earlier are the main obstacle in propagating the usage of new technology among seniors.

It is difficult to make any conclusions here about a relation between IT skills and the attitudes towards social contact in general as there were too many missing answers. The example of the eager socialisers would suggest a negative correlation. However, this is only an intuitive hypothesis based on a small sample and as such should be treated with scepticism.

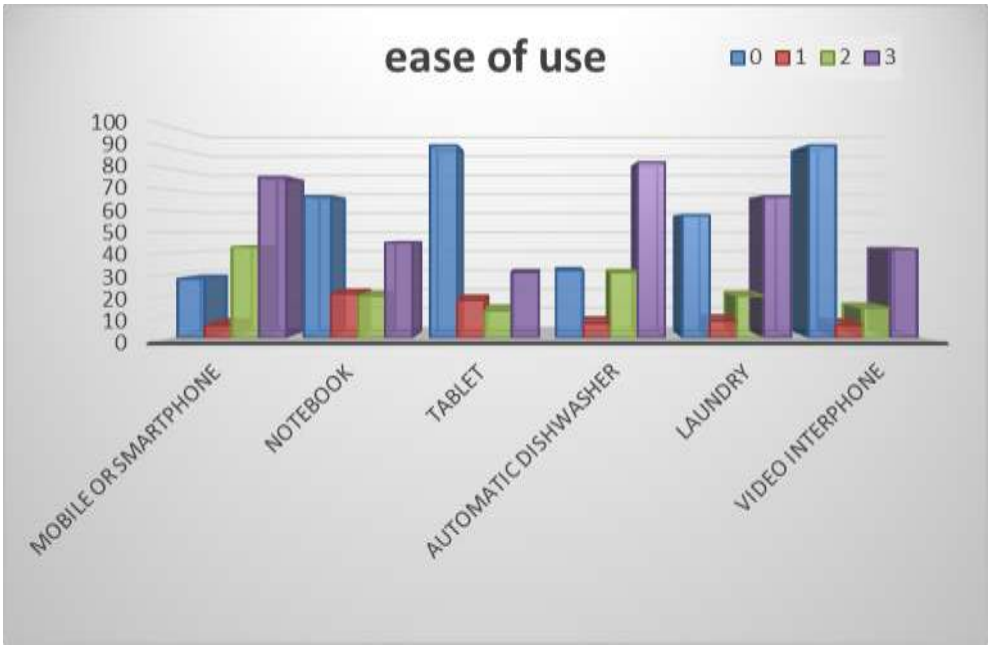
There is a general believe that women tend to be more open in contacts with other people and, therefore, have more intensive social life than men. The data form the NITICS research does not confirm such relationship; there is simply no much difference between our male and female respondents in this matter. Similarly, in both Poland and Romania seniors seem to have a similar, active socialising pattern: around 70% of respondents meet people on regular basis, only in Slovenia the number in this respect drops down to 55% whereas in France 90% of the respondents socialize almost daily. We have to remember though, that there were only nine questionnaires completed in France, which does not allow for drawing any broader conclusions .

4.6 Operating devices

The next set of questions in the questionnaire was devoted to the operating skills of various devices: mobile phone, PC/ laptop, a touchscreen device such as tablet, washing machine, video interphone and a dishwasher. The skills were measured on the scale from 0-impossible or extremely difficult to 3-very easy. The results are more than surprising. The easiest device to use out of all was a mobile phone. As many as 78% of respondents claim they do not have any problem using it. The number is even higher than a dishwasher usage (74%) and washing machine (57%). (However the pleasure to use all three devices is at a similar level).

Two possible explanation of this phenomenon come to mind:

1. It is possible that in the age of widespread use of mobiles, some respondents may have felt embarrassed to admit to lack of skills in this area and, therefore, would have given incorrect answers.
2. Unlike with operating a washing machine or a dishwasher, which are connected to primarily females' chores (especially in the older generations), in the case of a mobile phone usage there is no such gender division.



Source: based on data from NITICS survey

Figure 15: Ease of use

A study conducted in Greece on a sample of 300 people age 65-74 showed that 94% of women used regularly household appliances such as washing machine and iron, whereas 98% of men used… a TV. In regards to mobile phone, 60% of women and 93% of men were using mobiles. In Germany 86% of seniors from the same age category own a mobile phone (regardless of sex). These findings seem to be more in favour of the second hypothesis, suggesting that mobile phone (and possibly other technological devices) are more "democratic" in use than household appliances.

Besides the skills related to the operation of the devices, we also wanted to look at other aspects such as pleasure to use a device, the need for help in using it from other people, or usefulness of additional instructions. On the basis of these four variables an index was designed, the scope of which ranges from 7 to 84 points. By using the index the respondents were divided into 3 groups: persons using the technology on a low (10 people), medium (27) and high (8) level (based on data from respondents who answered to all subpoints in the question).

Among the most difficult devices to use were touchscreen devices, such as tablet (71% of the participants admit they have a great difficulty in using it), and a laptop (57%).

Despite the theories and studies pointing to a digital exclusion of the elderly such factors as age, gender or income do not seem to influence the usage of the facilities in our research (the correlations are not statistically significant). Yet, these studies which do show the lowering tendency to use computers & Internet with age are based on representative surveys with thousands of participating respondents. Hence, it is possible that the result would be very different if a wider range of age was considered in our study. However, we have to remember that the research did not aspire to compare the usage of the facilities across different generations of people.

Also, the willingness to socialize does not seem important for the usage of new technology and other devices. The only variable which did affect the advancement of skills was self-sufficiency. The higher level of self-sufficiency the better the skills. For example, one of the respondents who is blind and therefore heavily dependent on the help of others demonstrated one of the lowest level of technical skills.

Attitudes towards sensors, monitors and cameras

Last but not least, the respondents were asked whether or not they would agree to install at their homes various devices, such as an electric lock, camera, a screen or an electric box worn by them in order to increase their safety and comfort. It was also interesting to check how and if the seniors respondent are afraid of intruders. As we can see from the table, 55 respondents are slightly worried and 44 of them are rather worried.

Source: based on data from NITICS survey

Figure 16: Fear of intruders

This suggests a rather significantly high level of anxiety towards intruders or break-ins among the seniors. This is probably the reason why 67% of the survey participants would agree to have an automatic lock installed. Other devices with a relatively high acceptance include: a portable sensor (72%) and a fall-detecting sensor (69%). The most controversial features are video cameras at home (33%) and a screen used for gathering information and enabling communication, which gathered as many proponents as opponents.

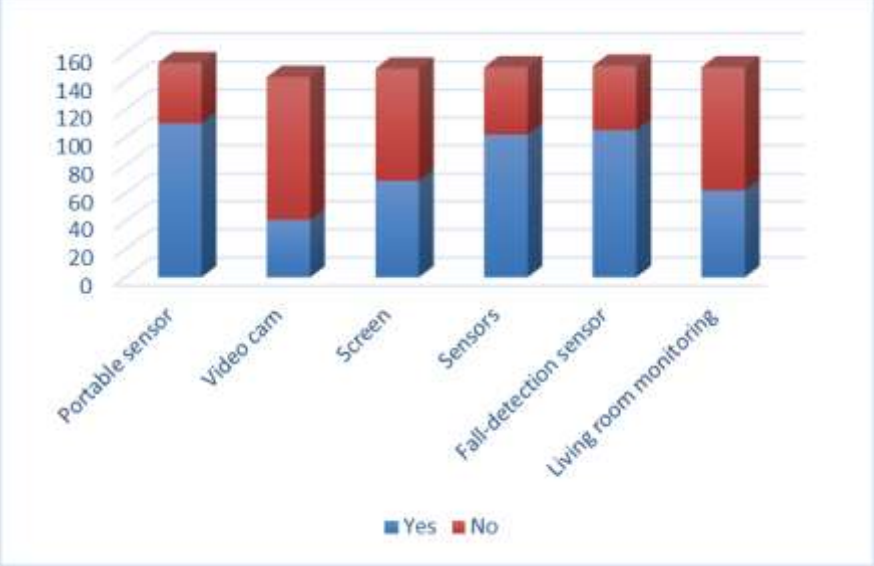


Figure 17: Emergency assistance/support

Interestingly, women seem to be much open to using various security devices, but especially those related to detecting irregularities and threats, such as a portable sensor, sensors installed at home and fall-detection sensors.

This part of the questionnaire is essential in recognizing the attitudes towards such an innovative solutions as the NITICS project propose, which were completely unknown to the elderly before - and possible barriers in accepting to use them. We assumed that the answer will depend on demographic variables, such as age and income as well as health condition and familiarity with new technology. For this purpose a variable was created which summed the coded consent or lack of it for installing a specific equipment. Then it was correlated with demographic variables. Both age, gender and income of the respondents did not affect the consent to the presence of the devices at home. There is also no significant relationship between the agreement for the installation of equipment and technological abilities and the respondent's state of health. The most common reason to refuse installation of the devices was the fact that they are simply not needed by the elderlies just yet (they would often add that they lived with a family so they were properly taken care of). Other factor influencing lack of consent was privacy issues and a fear that such devices as cameras or screen would interfere with their privacy.

5 Part II Secondary users

The second part of the research was conducted among the group of caregivers. The main idea was

- to complete the information receive from the first survey on the primary users (the elderly), that is their main problems that the senior citizens/elderly face at home in their day to day lives but from the perspective of persons who regularly look after not only the seniors abut also other people in need (handicapped, disabled).
- To receive hints on possible technical improvements, which would be useful/ needed in the caregivers' opinion

The survey was completed by 48 people: 17 from Romania, 15 from Slovenia, 9 from Poland, 3 from France and 3 from Switzerland. As the total number is not very large it makes little sense to present the results from the questionnaire in per cents, hence there will be mainly in nominal numbers used in this part of the reports rather than per cents.

The researchers were aiming at gathering a similar number of qualified carers and informal carers, which would allow for making comparisons between the two groups. We will define informal care as unpaid help from family, friends and/or neighbours to the elderly who require long-term assistance with activities of daily living. Typically it is the partners (most often women) and children taking the role of an informal carer. As populations age, however, there will be fewer people able to provide such care.

5.1 General picture

The overwhelming majority of the caregivers we questioned were women (42). There were only six man in the total sample, and – interestingly – half of them come from France and Switzerland which make only for one 1/7 of the total number of respondents. The two other male caregivers come from Romania and one from Poland.

Although caregiving is believed to be a predominately female domain, on the whole, there are no such gender distribution gap as it appears from our study. In the US, for example, it is estimated that 66% of informal caregivers are women. However the gender balance shifts to almost equal among the younger carers age 18-45. This probably reflects a general social tendency that men (especially the younger ones) take up the jobs which used to be reserved almost exclusively for women, such as nursing, working in a kindergarten, etc.

In Europe the situation differs across countries but in the countries like Belgium, The Netherlands and Denmark the number of male and female caregiver is almost the same, whereas in the east and south part of Europe - Poland, Romania, Bulgaria, Spain, Italy, Greece – the gap in gender distribution is rather significant.

The youngest caregiver participating in the survey was 24, and the older 65, but the great majority ascribe to 42-55 year old group.

5.2 Experience

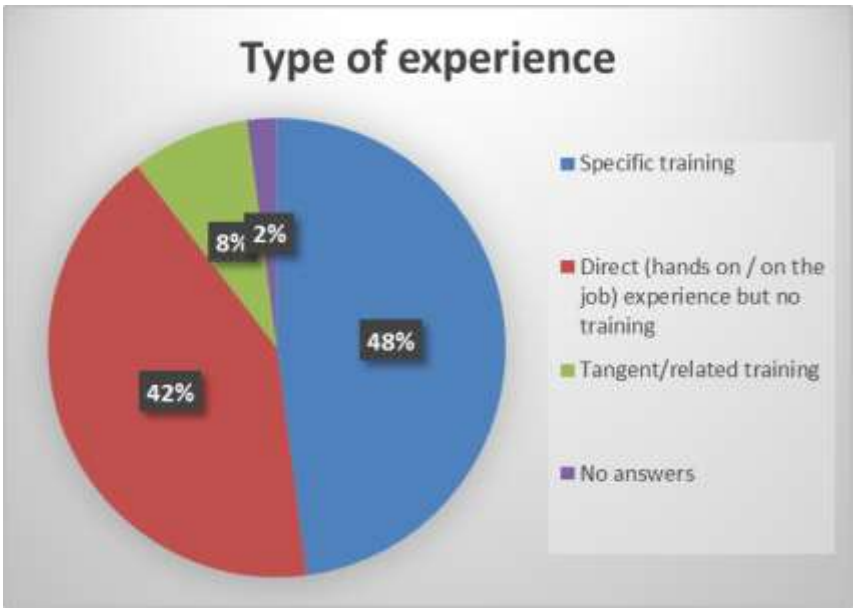
There are as many qualified as unqualified caregivers among the respondents from our survey. 23 of them boast to have specific training designed for caregiving skills. 20 caregivers have gained their experience through long and regular practice (hand-on experience) and another four claim to have some kind of a related training.

LONG TERM CARE QUALITY

Good quality of LTC maintains or, when feasible, improves the functional and health outcomes of frail, the chronically ill and the physically disabled old people. Three aspects are generally accepted as critical to quality of care: effectiveness and safety, patient-centredness and responsiveness, and care co-ordination. LTC includes a range personal care services to help disabled people with basic activities of daily living (ADL), as well as basic medical services, nursing care, prevention, rehabilitation or palliative care. It can also include domestic help and help with administrative tasks.[1]

(OECD Health Data)

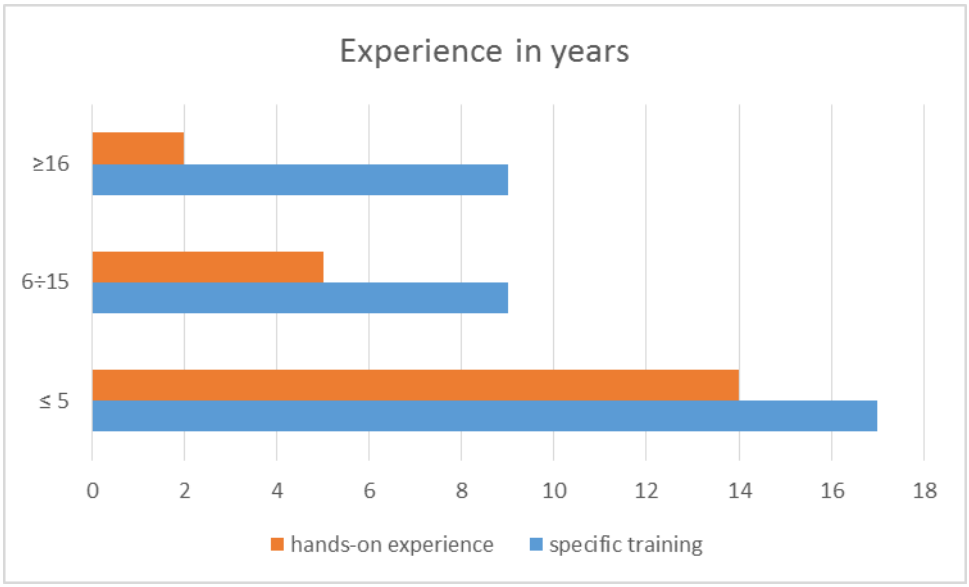
Qualified caregivers have on average longer experience than the non-qualified carers. (10 years comparing to 6).This is not so surprising considering the fact that for the trained caregivers the care is their occupation whereas most of the informal carers, we might presume, have other jobs and caring is an additional activity.



Source: based on data from NITICS survey

Figure 18: Type of experience

Regardless of qualification, the majority of carers have less than five years of experience in this field. The bigger differences start to show with the length of time. Nine of the specialised caregivers have had between 6-15 years of experience (compared to 5 non-qualified carers) and also nine - more than 16 years. The longest experience in this category was 27 years. There were only two informal cares with experience over 16 years.

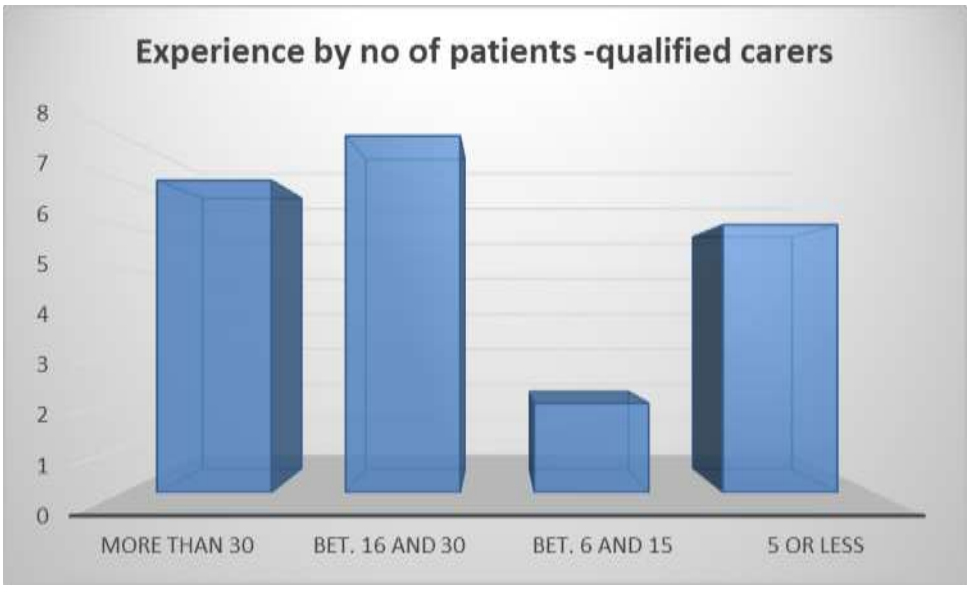


Source: based on data from NITICS survey

Figure 19: Experience in years

When it comes to experience as measured by the number of clients the majority of caregivers (22 people) have looked after 5 or less persons. On the second place there are carers (12 respondents) who have cared for more than 30 persons. All of the French and Swiss respondents (7) reside in this category, which suggests that they might be working in a nursery home or a similar place.

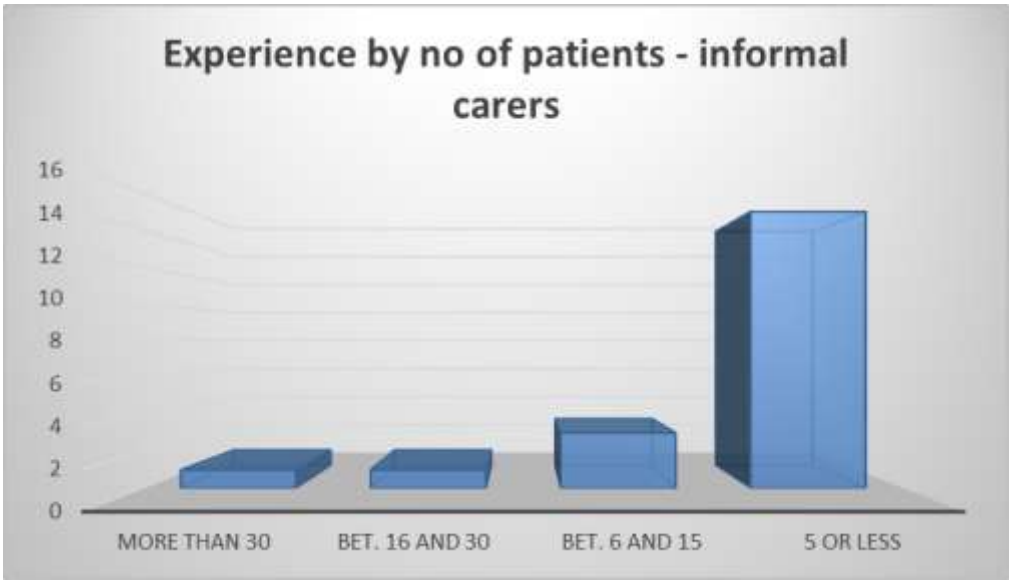
When we look however, at the data from the perspectives of qualified vs non-qualified (informal) carers the answers look quite different. As many as 15 professionals have taken care of more than 16 seniors, and only six of them, of 5 or less.



Source: based on data from NITICS survey

Figure 20: Experience - qualified carers

The situation is reverse in the case of informal caregivers; the overwhelming majority of them have had caring experience with 5 or less patients. The reason for this is that the unqualified carers look after their own family members, hence the care tend to be longer but limited in the number of people in care.



Source: based on data from NITICS survey

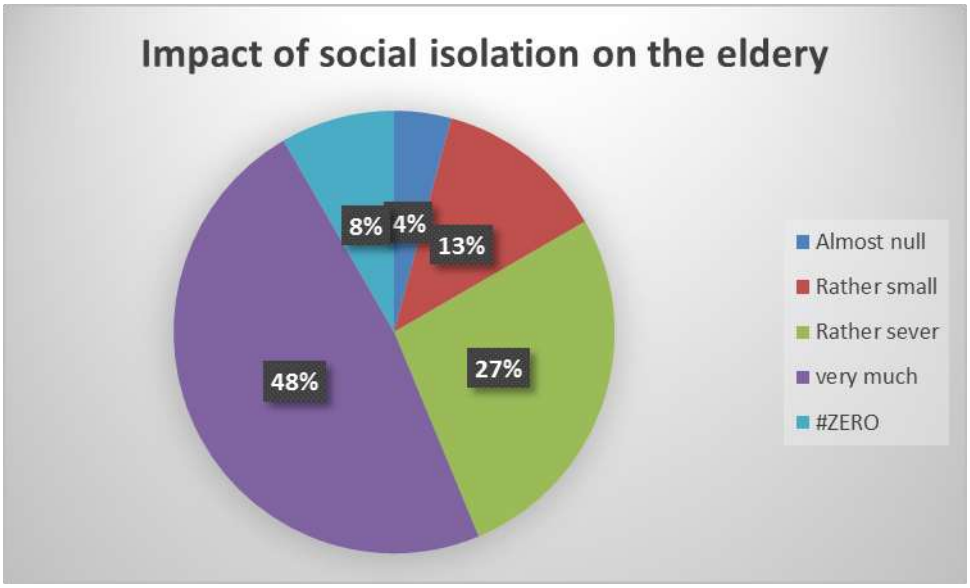
Figure 21: Experience - informal carers

The data from both groups indicate that at the moment when the survey was conducted 20 respondents worked with 5 or less clients, and the same number of them (19) receive regular and irregular services. 14 of the carers were looking after 6-20 clients (6 receive regular services and 4 irregular), and the rest ten had more than 21 clients (some of them claimed to such high numbers as 70). As the graphs above show these were, of course, the trained caregivers working professionally in this occupation

30 caregivers said they have patients who need a permanent care, provided by a person who live in the same house. As we already know from the previous survey among seniors, most of their carers are family members, especially spouses, So it is justified to assume that also in this cases majority of those carers are relatives of the person they take care of.

5.3 Socialising

When asked if they believed if the elderly suffered from social isolation, 85% of the carers said yes and the other 12 were not sure. We asked further to assess how discomforting this isolation might be for them and these are the results:



Source: based on data from NITICS survey

Figure 22: Socialising

23 people (48%) think that this situation might be very discomforting for the seniors (in other words, they would wish thay had more social contacts) and the further 13 assessed it as rather severe (27%). This present quite a different picture from the one we recived when we asked similar question the seniors thamselves. As it was pointed out above 77% of the seniors we talked to socialize on regular basis. But, we have to remember that most of the seniors-respondents were rather fit and able to go out, and did not receive a regular care services.

There are several hipothesis that comes to mind when looking at these discrepacies, non of these, however, could be tested with our existing data:

- Due to their profession and a specific relationship with the patients the caregivers rate their seniors as more vulnerable and isolated than the seniors would rate themselves
- More than half of the elderly we researched do not receive any kind of care, which might indicate that they feel in a relatively good shape, which in turns, help them to maintain intensive social life.
- Loneliness is a rather sensitive issues, therefore, the seniors are unwilling to admit to a stranger interviewer they do, in fact, feel socially isolated.

14 of the cares believe the situation might be improved with deployment of virtual aids, such as the Internet, and specific social networks. Slightly higher number (16) is more sceptical and say, it would not have much impact, whereas 11 believe it would not have any impact at all. And the reasons for this situation are similar to those given by the seniors: lack of interest and lack of sills. But the carers also pointed out to health problems which would unable the clients to use the Internet even if they would wish to.

The carers themselves have not a greater problem using most of the technology devices we asked about. 44 people use mobile phone, smartphon or a PC/ laptop with a relative ease (although in the case of the latter two, 10 people find it extremely difficult). A tablet seems to be slightly more problematic, as the number in this case drops down to 31.

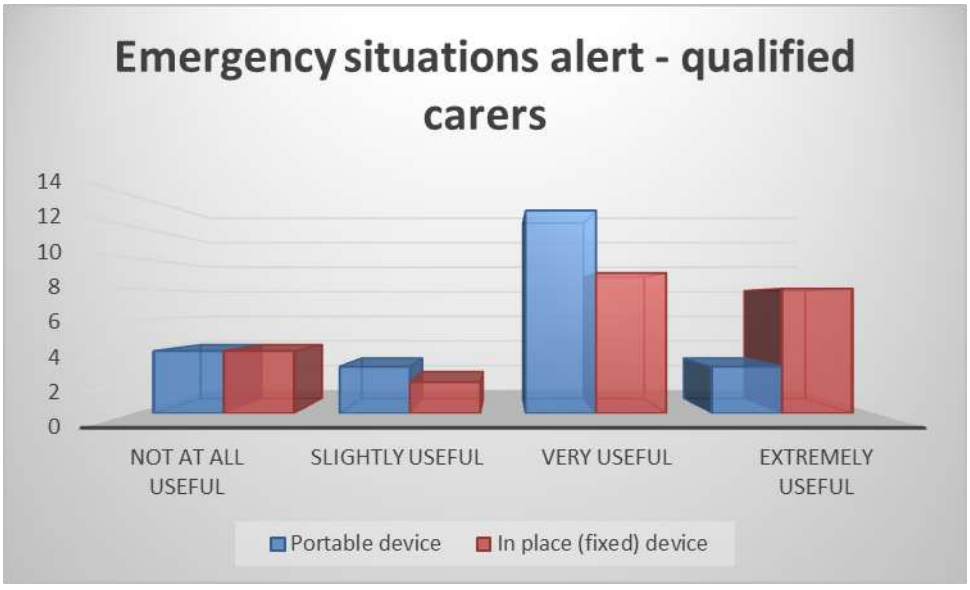
5.4 Attitudes to ITC devices

The next set of questions are devoted to the most essential part of the survey, concentrating on recognizing the attitudes towards various devices used to facilitate caregiving and assessing their usefulness. Some of the data from this part of the questionnaire will be presented on separate graphs for professional and informal caregivers to allow for comparisons between the two groups.

This approach stems from the suspicion that the professional caregivers might present different opinions on the devices NITICS is planning to introduce, as they may be somehow afraid that the wider usage of this kind of solutions would influence their amount of work with patients, and as a result, they will not be as needed as they are now or that they might even lose their jobs. This is just an intuitive hypothesis which occurred during the analysis of the empirical data, and that is why we have decided to look at some of the answers separately for the qualified and non-qualified caregivers.

First we asked how useful would it be for a caregiver to have either a portable device or the one installed in the office, that alerts her/ him in case the clients need emergency or immediate help.

It seems that those who do see the potential in this kind of devices would be inclined to choose the portable device (18 of 23 qualified caregivers) rather than the fixed one. Very similar answers were given to the question about a device which would allow to monitor their clients.



Source: based on data from NITICS survey

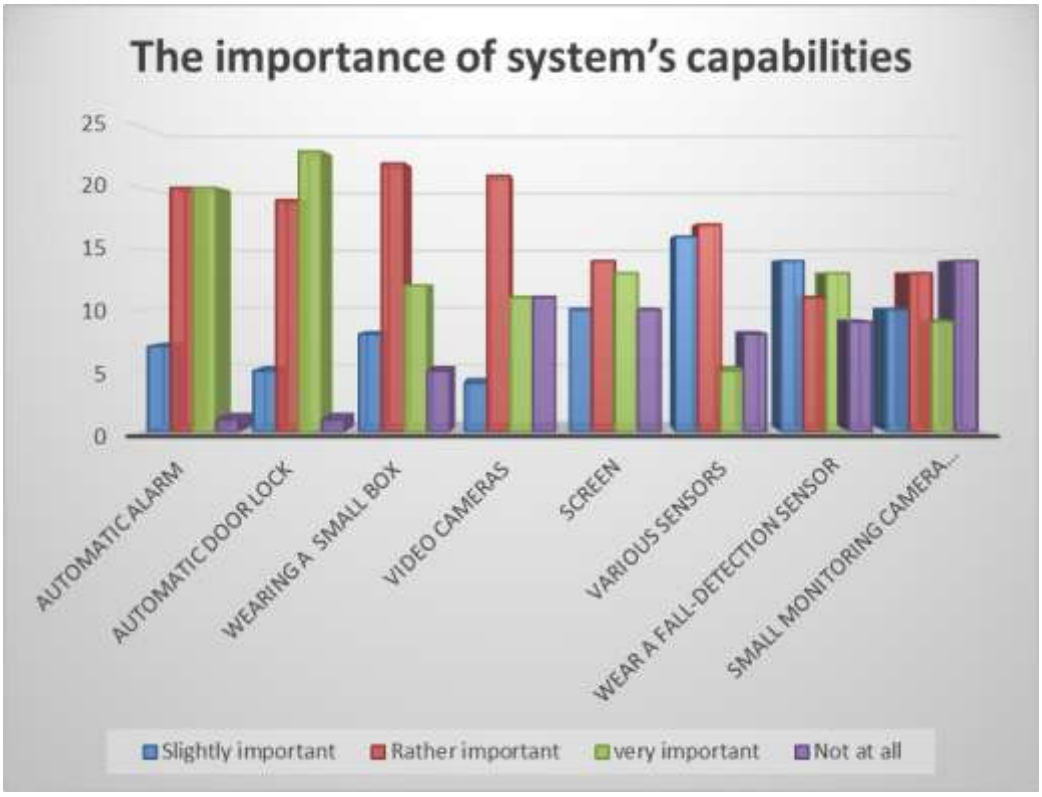
Figure 23: Emergency situations alert - qualified carerers

Meanwhile, from the group of the informal carers only seven of them would find both kind of emergency devices - portable and the fixed device - as useful.

Out of the eight features helping to monitor and measure the conditions of the caretaker, two were rated as very important by the respondents (in general), that is an automatic door lock accessible to caregivers and rescue services (40 persons) and an automatic alarm system, triggered for example in case of falling (42 people). Many caregivers believe that wearing a small box by their clients, in order to get quick help might be also a good idea as well as using cameras installed in the patients' homes (36 and 33 respectively, but unlike with the first two questions the most of the positive answers were "rather important", not "very important").

The respondents were most sceptical towards the small cameras and sensors distributed in various parts of their patients' house.

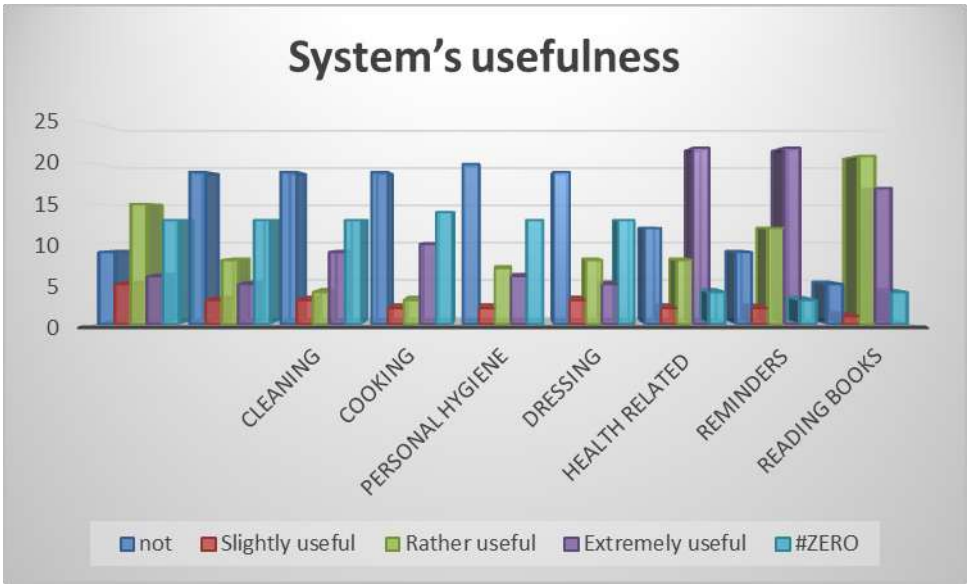
There were not many differences between the formal and informal carers in this respect. Perhaps the qualified respondents rated slightly higher the importance of wearing an anti-fall sensors then the informal interviewees (8 compared to 4) but there were not many other differences.



Source: based on data from NITICS survey

Figure 24: System's capabilities

The survey also focused on the possible areas in which the carers might need help from the system. Interestingly, both type of caregivers would expect some help (38 respondents) with reading books, reminders (34) and health related issues (30) and errands (21). They do not seem needing much help with typical house chores such as cleaning and cooking. But, we have to be careful here interpreting these data. Lack of need for help in domestic areas do not necessary mean that the caregivers are completely self-sufficient doing these tasks. It may as well mean that these tasks are not a part of their responsibility and this is the reason they do not expect help with.

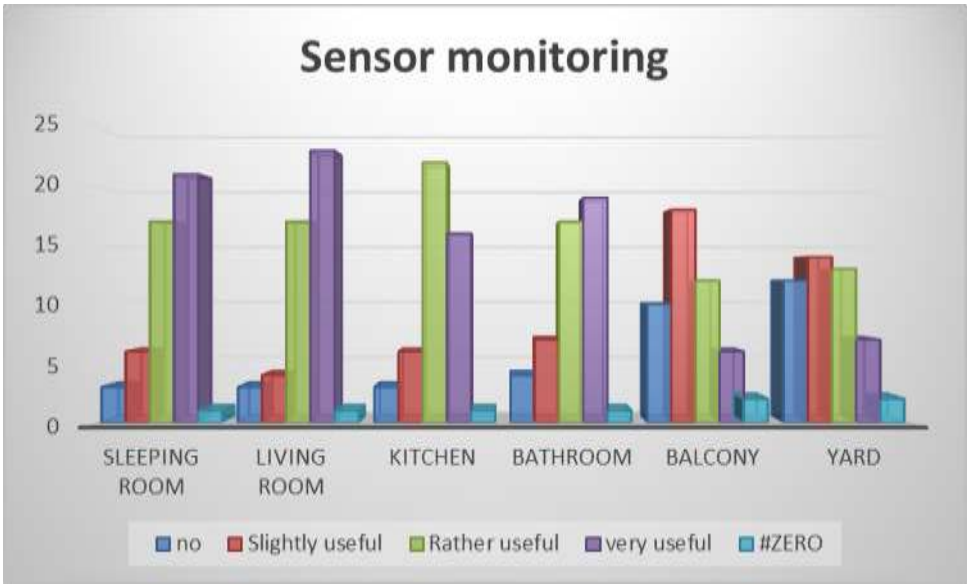


Source: based on data from NITICS survey

Figure 25: System's usefulness

The caregivers in general do not see much use in monitoring their clients in most of the research areas **by videos**, but especially in a yard and balcony. Also other parts of a house, like living room, kitchen and bathroom did not gather many supporters. Only monitoring of a sleeping room met with relative acceptance: 15 rated the device as rather useful and 6 as extremely useful.

However, their attitude is rather different when it comes to the usage of **sensors** for the same purposes. In kitchen, living room, bathroom and sleeping room they find it very useful or rather useful. Only outside the house do the estimations of usefulness drops down.

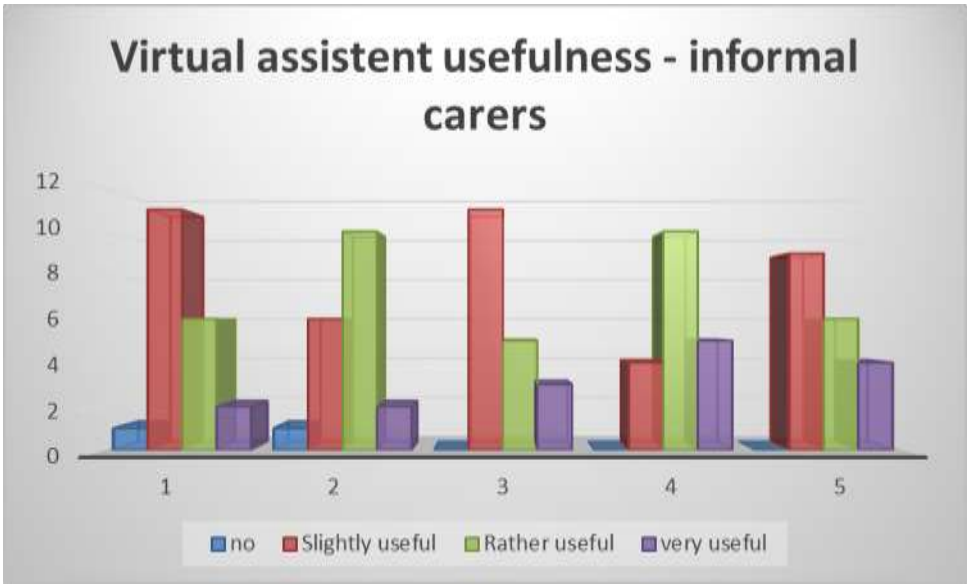


Source: based on data from NITICS survey

Figure 26: Sensor monitoring

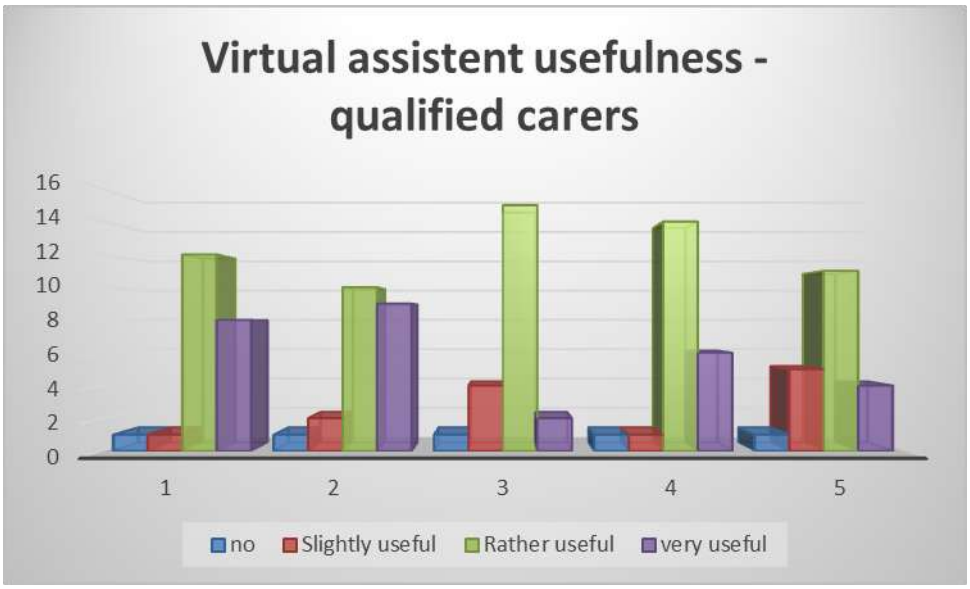
To sum up this part of the report, the whole ideal of the virtual assistant was regarded rather positively: 30 caregivers say the system is needed for improving the quality of life for the elderly. Even more respondents (35) see the possibility to improve the efficiency of their work thanks to the employment of the system. The most interesting conclusions that stem from this question are visible only when we compare the answers between the two groups of caregivers.

- For the qualified carers the virtual assistant is believed to be very or rather useful when working with elderly citizens for 8 and 12 people respectively. This is twice as much as the similar answer from the informal carers; majority of them see the application as slightly useful (11 people)
- Not surprisingly, the formal caregivers see the potential the systems offers also for the company they work for (17 out of 23 respondents) or other companies working in a caregiving services.
- The informal carers are more sceptical about the possibility of the system may offer to the seniors' family and relatives



Source: based on data from NITICS survey

Figure 27: Virtual assistent - informal carers



Source: based on data from NITICS survey

Figure 28: Virtual assistent - qualified carers

6 Expectations

The carried out survey has provided some results and conclusions which let to refuse some solutions and focus on more acceptable or expectable. The interest of new devices depends on many details like features, mockups, ease to use etc, thus these results only show the most needed ways.

Table 1: Survey results and NITICS related service

SURVEY RESULT	NITICS RELATED SERVICE
The great majority of carers would see the application of a virtual assistant especially in health-related matters of their clients.	Some kind of the NITICS platform devices should provide a prevention services or devices to control health condition on regular basis.
2/3 of the seniors expressed strong interest in anty-fall sensors and other sensors; **78% of them use mobile phone with an ease.**	Users should have a possibility to call emergency (f.in.: in case of falling down) or call help in non-urgent situation (go walk with a dog, go shopping, or to a doctor, church etc.)
High interests in a fall-detecting sensor (69%). **Similar number would also accept other kind of sensors.**	The NITICS platform should send an alarm to the appropriate intervention services (doctors, caregivers...) with an assistance request when a fall-down event of an elderly people is detected
Majority are really afraid of intruders and an automatic alarm system has a high acceptance (91 respondents)	The NITICS platform should contain a safety alarms (personal or installed at home).
The acceptance for automatic door lock accessible to caregivers and rescue services (69% of respondets)	Like above: the elderly expect a feeling of safety thus it would be important to design an easy alarm system improving the safety.
85% of the carers claims that the elderly suffer from social isolation. (has to be proved during the conjoint analysis).	The NITICS platform should allow to be in touch with friends/family or the Universities of the Third Age.
The easiest device to use out of all was a mobile phone (based on data from NITICS survey).	From technical point of view is it a direction that the platform could be attended by mobile phone.
A study conducted in Greece showed that 98% of elderly men used a TV. (has to be proved during the conjoint analysis).	It could mean that some services, diagrams, analysis users could observe on the TV screen. The elderly people are acquainted with TV set thus changing setting etc using it could be more natural than using tablet, PC etc.
TECHNICAL TASKS	
A high acceptance of a portable sensor (72%) from the elderly people and caregivers who believe that wearing a small box by their clients, in order to get quick help, is a good idea.	
Caregivers said that they would be more interested in portable devices rather than a fixed one.	
All caregivers would expect some help with reading books, reminders and health related issues and errands.	

7 Conclusions

7.1 Primary users survey

- One of the most staring evidence, coming not only from the research but also from any demographic data is the fact that women over 65 outnumber men to a large extend. Perhaps this should be taken into account when a) designing the product b) marketing & advertising the product.
- A fear that such devices as cameras or screens would interfere with the privacy of the seniors is an important issue. Therefore, more attention should be paid to convincing the primary users that the system guarantees the inviolability of private and intimate spheres
- The older Internet users, studies show, are much less open and willing to share their privacy online with the other users than the younger people.
- Home is where most people receive care (and want to continue this as long as possible); this is why focusing on improving home environment should be treated as a priority. From this perspective the NITICS project fits perfectly well the seniors' needs and expectations.
- The idea of NITICS and other project alike is based on assumption that the technology which supplements human skills can relieve the overstretched geriatric. But it also recognises that technology alone will not solve the issue. Obstacles to its adoption include technical and regulatory barriers, ethical concerns, lack of awareness, and limited research and development funding.
- There are also other cultural obstacles, such as distrust towards such mechanical (rather than human) technical assistance, difficulty in learning necessary skills to operate and use the solutions. These are as important as technical issues and it should be remembered that it takes time and experience to overcome such "soft" barriers.
- The research is based purely on respondent's declaration, that is subjective opinions and statements on the subject we are interested in. In order to deepen the results a wider approach would be needed with the use of various research method such as fieldwork and ethnographic account of elderly peoples' everyday life and their environments.

7.2 Secondary users survey

- There are some discrepancies between the results from the first survey among seniors respondents and the caregivers as to the level of social isolation. Should this information be important for further actions within the project, another research is advisable in which seniors in care are looked at more closely.
- The attitudes towards virtual assistant and other technological facilities may be differed between the professional/ formal caregivers and the informal ones. The former may look at it as a threat to their current job, whereas the latter may see it as an innovative form of help and relief. Although this correlation is not obvious in our survey, this possibility should be kept in mind for future actions.
- Also the two groups of carers may have different expectations towards the specific tasks/ help the virtual assistant would carry out. Therefore a further in depth analysis would be required with the usage of qualitative rather than quantitative methods.
- Female caregivers outnumber male ones to a large extend. Consequently, this aspect should be taken into account when the product/ system is to be released on the market.

8 References

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Document history

Table 2: Document history

Ref.	Title	Doc.-ID	Version	Date
[RD1]	Initiation of Table of Content (ToC)	NITICS_WP2_D2_1_R_P_1v0.doc	1.0	22.10.2013
[RD2]	Inclusion of first contributions of the consortium partners	NITICS_WP2_D2_1_R_P_2v0.doc	2.0	25.10.2013
[RD3]	Inclusion of last contributions of the consortium partners	NITICS_WP2_D2_1_R_P_3v0.doc	3.0	08.11.2013
[RD4]	Finalization of deliverable content	NITICS_WP2_D2_1_R_P_4v0.doc	4.0	15.11.2013

Attachement 1: The questionnaire for primary-users survey (EN) + introduction

Instructions and recommendations

Dear Madam/Sir,

Thank you for your participation in our survey. The aim of this survey is to learn more about the main problems that the senior citizens/elderly face at home in their day to day lives in order to improve their quality of life and wellbeing, by utilizing modern technology. We plan to design so called "**virtual assistant**" – a set of devices that would be placed in a home of a senior person to improve his/her quality of life and wellbeing. You will be asked a series of questions, and we would like you give us your most honest opinion with respect to you, personally. Also, should any of the questions be unclear or you need further information, do not hesitate to ask our interviewer.

Demographic data

(Q1) a. **First name** .

(optional) Leave blank if not provided

b. **Last name** .

(optional) Leave blank if not provided

(Q2) **Age** (in yrs.) .

(Q3) **Questionnaire code** .

(Q4) **Gender**: Male ☐ Female ☐

Living arrangements

Housing (separate living arrangements)

(Q5) House ☐ Flat ☐

(Q6) Backyard ☐

(Q7) Number of rooms (total number of rooms, including living room) .

Other inhabitants

(Q8) (None (lives alone) ☐ Partner/Spouse ☐ Other: ☐

(Q9) If other, please specify .

(Q10) Number of other inhabitants under 65 yrs. (insert number) .

(Q11) Number of other inhabitants over 65 yrs. (insert number) .

Caregiving status

(Q12) **Permanence of caregiving** services received

None ☐ Nonpermanent ☐ Permanent ☐

(Q13) **Type of caregiving**

Specialized/dedicated (e.g., registered nurses, specialized personnel etc.) ☐

Nonspecialized persons (e.g., relatives, friends, temporary or unqualified employees, etc.) ☐

Financial status

(Q14) Self-estimation of **living standards**

Poor ☐ Decent ☐ Good ☐ Very good ☐

(Q15) **Income range** (in EUR per month)

Bellow 100	101 ÷ 500	501 ÷ 1000	1001 ÷ 2000	Over 2000
☐	☐	☐	☐	☐

Health status

(Q16) Do you suffer from any **chronic health condition**? YES ☐ NO ☐

(Q17) If you do, please specify bellow which conditions:

(Q18) Do you suffer from **any mobility problems**? YES ☐ NO ☐

(Q19) If you do, please specify **how severe** are those (how impeding are for you day to day activities?)

Slightly impeding ☐ Moderately impeding ☐ Severely impeding ☐ Immobilizing ☐

(Q20) How would you rate your **general state of health**?

Very good ☐ Rather good ☐ Rather bad ☐ Very bad ☐

(Q21) What are your main health concerns or complaints?

Estimation of need for assistance

	(Q22) **Degree of importance of assistance** How much assistance do you need with this activity? 0 = Not at all; 1 = Slightly; 2 = Very; 3 = Essential				(Q23) **Availability of assistance** Is help / assistance available for you with this activity? 0 = No; 1 = Yes, occasionally and non-tasked person; 2 = Yes, dedicated other/non-caregiver; 3 = Yes, dedicated/tasked caregiver			
	0	1	2	3	0	1	2	3
a) Help with errands outside the house (shopping, invoice payment, etc.)	☐	☐	☐	☐	☐	☐	☐	☐
b) Help with moving inside the house	☐	☐	☐	☐	☐	☐	☐	☐
c) Cleaning	☐	☐	☐	☐	☐	☐	☐	☐

d) Cooking	☐	☐	☐	☐	☐	☐	☐	☐
e) Personal hygiene	☐	☐	☐	☐	☐	☐	☐	☐
f) Dressing	☐	☐	☐	☐	☐	☐	☐	☐
g) Health related (e.g., supervised gym, measure health parameters, etc.)	☐	☐	☐	☐	☐	☐	☐	☐
h) Reminders	☐	☐	☐	☐	☐	☐	☐	☐
i) Reading books, TV subtitles	☐	☐	☐	☐	☐	☐	☐	☐
j) Other:	☐	☐	☐	☐	☐	☐	☐	☐

(Q24) If other, please specify bellow which:

Socializing (social relations):

(Q25) A. Frequency (general)

How often do you socialize?

Almost never	A few times per month	A few times per week	Almost daily
☐	☐	☐	☐

(Q26) B. Self-estimated need (general)

Do you want to socialize more / Do you feel the need to socialize more with other people?

Almost never	Rarely	Often	Almost always
☐	☐	☐	☐

(Q27) C. Self-estimated need (Internet)

Would you enjoy having the possibility to stay in contact with other people (relatives, but also unknown people) via the Internet (social network, like Facebook)?

Almost never	Rarely	Often	Almost always
☐	☐	☐	☐

(Q28) If you answered NO at question C, please tell us why?

a) Lack of time — I don't have enough time ☐

b) Lack of means — I don't have how / the means to do it ☐

c) Lack of skills — I don't know how to do it ☐

d) Lack of interest — I don't feel the need to do it ☐

Security concerns:

		Very worried	Rather worried	Slightly worried	Not at all worried
(Q29)	Are you worried about intruders breaking inside the house?	☐	☐	☐	☐

		Very important	Rather important	Slightly important	Not at all important
(Q30)	How important do you find the installation of an anti-theft/anti-intruder alarm system?	☐	☐	☐	☐

Emergency assistance/support

(Q31) Do you have a **person on which you can rely on in** cases of emergency such as illnesses, health crises, accidents or injuries? YES ☐ NO ☐

(Q32) If YES please name here that person

(Q33) **Type of emergency caregiver** (if applicable)

Relative ☐ Friend ☐ Dedicated caregiver ☐

		Very important	Rather important	Slightly important	Not at all important
(Q34)	How important do you find to have an **automatic alarm triggered in case of falling** that calls for help?	☐	☐	☐	☐

(Q35) In order for you to get help promptly in case of emergency would you accept to install on your house's main door an **Automatic Lock accessible to caregivers and rescue services** to help you in case of an emergency? YES ☐ NO ☐

(Q36) If you chose NO, please explain here why

(Q37) In order to get help for your most important needs, would you **wear a small box (mobile phone size) for most of the time?** YES ☐ NO ☐

(Q38) If you chose NO please explain here why

(Q39) In order to get help for your most important needs, would you **allow installation of video cameras in the house?** YES ☐ NO ☐

(Q40) If you chose NO please explain here why

(Q41) In order to get help for your most important needs, would you agree to **have a screen installed in your house which can be used for information and communication?** YES ☐ NO ☐

(Q42) If you chose NO please explain here why

(Q43) In order to get help for your most important needs, would you allow to **have various sensors installed in the house, e.g. some small boxes on the walls?** YES ☐ NO ☐

(Q44) If you chose NO please explain here why

(Q45) In order to promptly get help in case of falling-down, would you accept **wearing a fall-detection sensor?** YES ☐ NO ☐

(Q46) If you chose NO please explain here why

(Q47) In order to promptly get help in case of falling-down, would you accept **having a small monitoring camera in your living room?** YES ☐ NO ☐

(Q48) If you chose NO please explain here why

Further participation

(Q49) Would you be willing to answer more questions from us regarding similar issues, one more time, in the future? YES ☐ NO ☐

(Q50) If you chose NO, please explain here why

(Q51) Do you agree to try and test some of NITICS solutions? YES ☐ NO ☐

(Q52) If you chose NO, please explain here why

(Q53) Is there anything at all that you would like to add regarding the subject of our project?

Technology acceptance

Column A: How easily do you operate the following devices?

Column B: How pleasant is for you to (have to) make use of the following devices?

Colum C: How much assistance from somebody else do you require to operate the following devices?

Column D: How useful would it be for you to benefit for additional help such as clear instructions when operating the following devices? (*column D is scored only from 0 to 2 !*)

Scoring instructions for columns A ÷ D

A 0 = impossible or extremely difficult, 1 = rather difficult, 2 = rather easy, 3 = very easy

B 0 = impossible or extremely unpleasant, 1 = rather unpleasant, 2 = rather pleasant, 3 = very pleasant

C 0 = no assistance, 1 = little assistance, 2 = a lot/significant assistance, 3 = complete assistance

D 0 = no utility, 1 = little utility, 2 = a lot/significant utility

Scoring procedure: insert the rating/score number, on each column, according to rating scale intervals

Device	(A) (Q54) Ease of use	(B) (Q55) Pleasure to use	(C) (Q56) Human assistance	(D) (Q57) Usefulness of additional guidance
a) Mobile or smartphone				
b) Notebook / Laptop / PC				
c) Tablet or other touchscreen devices				
d) Automatic dishwasher				
e) Automatic laundry washer				
f) Video interphone				
g) Refer to any other device you consider important				

(Q58) If other, please specify here which

Privacy issues

In order for your virtual assistant to be effective, it may need to monitor, video or by sensors, several of your living areas. How much discomfort would you feel if it surveys your:

Living area	(Q59) Video monitoring	(Q60) Sensor monitoring
a) Sleeping room	.	.
b) Living room	.	.
c) Kitchen	.	.
d) Bathroom	.	.
e) Balcony	.	.
f) Yard	.	.

Rate choosing from

0 = no discomfort, 1 = slight discomfort, 2 = very discomforting, 3 = unacceptable

Attachement 2: The questionnaire for secondary-users (EN)

Caregivers

Instructions and recommendations

Dear Madam/Sir,

Thank you for your participation in our survey. The aim of this survey is to learn more about the main problems that the senior citizens/elderly face at home in their day to day lives in order to improve their quality of life and wellbeing, by utilizing modern technology. We plan to design a "**virtual assistant**" – a set of devices that would be placed in a home of a senior person to improve his/her quality of life and wellbeing. You will be asked a series of questions, and we would like you give us your most honest opinion with respect to you, personally. You will be asked to give your insight and opinion about the use and effects of the above named virtual assistant in relation to the elderly, as an end-beneficiary, and to you, as a service provider. Also, should any of the questions be unclear or you need further information, do not hesitate to ask our interviewer.

Demographic data

(Q1) a. **First name** .

(optional) Leave blank if not provided

b. **Last name** .

(optional) Leave blank if not provided

(Q2) **Age** (in yrs.) .

(Q3) **Questionnaire code** .

(Q4) **Gender**: Male ☐ Female ☐

Specificity of caregiving services

Training

(Q5) What **type of training** do you have for providing caregiving services to the elderly?

Please check which applies to you (multiple choices are allowed).

Specific training	**Tangent/related training**	**Hands-on experience / training**
Such as in courses, school, specifically designed for caregiving	Such as in courses, school, that may relate with providing care for the elderly (e.g. first aid courses)	Such as in you have gained your experience through working with elderly people directly, without having any formal training
☐	☐	☐

Work experience

(Q6) How much **work experience** do you have with providing care services for the elderly?

Estimate in years (e.g., 12, 1/3, etc.). Please complete with a number that applies to you

In a formal capacity	**In an informal capacity**
Such as in registered caregiver, working for a firm, company, service, or on your own private practice	Such as in providing caregiving services without formal registration or engagement / employment with a company or service
……..	……..

(Q7) **How many** elderly citizens **DID** you work with **previously**, over the years, excluding those with whom you are working now (providing caregiving services for)?

Estimate in steps (e.g., <5, 6-15, 16-30, >30 etc.). Please check the box that applies to you

≤ 5	6-15	16-30	> 30
☐	☐	☐	☐

(Q8) **With how many** elderly citizens **DO** you **currently** work, not including those with whom you have worked before (providing caregiving services for)?

Estimate in no. of clients (e.g., 1, 4, etc.). Please complete with a number that applies to you

……..

Regularity. What type of regularity do your caregiving services have and had.

(Q9) Please estimate the **total number of clients** that you have now and had (past and present) over the years for whom you provided caregiving services, as in the manner described below.

Estimate in steps (e.g., <10, 11-50, 51-100, etc.). Please check the box that applies to you

No. of clients (elderly) with <u>regular</u> services					**No. of clients (elderly) with <u>irregular</u> services**				
Such as in providing caregiving services on a regular calendar, in virtue/on the basis of a more clear arrangement, usually with a longer duration					Such as in providing caregiving services only when asked or solicited by a client or a firm, usually for short duration of time and without a specific calendar				
0 (none)	≤5	6÷15	16÷30	>30	0 (none)	≤ 5	6÷15	16÷30	>30
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Locality of caregiving (residential/on-the-premises versus on-call caregiving)

(Q10) Please estimate the **total number of clients** that you have now and had (past and present) over the years for whom you provided caregiving services, as in the manner described below.

Estimate in steps (e.g., <10, 11-50, 51-100, etc.). Please check the box that applies to you

	0 (none)	≤ 10	11÷50	51÷100	> 100
No. of clients which necessitated **under 4 hours per day of caregiving**	☐	☐	☐	☐	☐
No. of clients which necessitated **full-shift hours** (8 hours shifts or, if 8 hours was not applicable, provide also the number of hours in your work shifts)	☐	☐	☐	☐	☐
No. of clients which necessitated **in-house living** (residential living arrangements, for instance, you had to live in the same house)	☐	☐	☐	☐	☐

Estimation of client-related impact

Socializing (social relations):

(Q11) From your own experience, would you say the elderly suffer from social isolation? (if NO/I don't know - go to Q13)

Yes	No	I don't know
☐	☐	☐

(Q12) A. **Necessity** (general). Perceived discomfort of social isolation

From your work experience with the elderly, how discomforting do the elderly find the impact of social isolation (lack of contact with other people)?

(for instance, think of how much do the elderly that you worked with complained about being isolated, or of your own observations about how their mood changed for the better if social isolation was reduced, or how much happier were those elderly that you worked with in comparison with those who were more isolated)

Almost null (insignificant)	Rather light	Rather sever	Very discomforting
☐	☐	☐	☐

(Q13) B. **Usefulness** of virtual aids **for socialization**. Estimated impact of Internet usage

How beneficial would you rate if the elderly had the possibility to stay in contact with other people (relatives, but also unknown people) via the Internet (e.g., by using social networks, like Facebook, or other virtual communities)?

Almost null	Rather small/little	Rather good	Very much (a lot)
☐	☐	☐	☐

(Q14) If the elderly have any difficulties performing activities from Q12, please tell us what are those (in your opinion)

Please check one or more of the boxes from bellow which you consider appropriate

a)	Lack of time	They don't have enough time	☐
b)	Lack of means	They don't have the means to do it	☐
c)	Lack of skills	They don't know how to do it	☐
d)	Lack of interest	They don't feel the need to do it	☐
e)	Health problems	Certain health problems that they have, impede their utilization (ability, concentration, effort, etc.) in using the Internet to socialize	☐
f)	Other	*If you can think of any other reason, please state it/them here, bellow*	☐

_____

_____

Emergency situations alert capability usefulness

(Q15) How useful would it be for you to have a device that alerts you in case that your clients need emergency or immediate help/support/caregiving?

Please check both columns with the rating that applies to you.

	Portable device Such as in a mobile device (e.g. tablet, smartphone, etc.)		In place (fixed) device Such as at your office	
Not at all useful	☐		Not at all useful	☐
Slightly useful	☐		Slightly useful	☐
Very useful	☐		Very useful	☐
Paramount	☐		Paramount	☐

Monitoring capabilities usefulness

(Q16) How useful would it be for you to have a device that allows you to monitor your clients' needs for which you are providing help/support/caregiving?

Please check both columns with the rating that applies to you.

	Portable device Such as in a mobile device (e.g. tablet, smartphone, etc.)		In place (fixed) device Such as at your office	
Not at all useful	☐		Not at all useful	☐
Slightly useful	☐		Slightly useful	☐
Very useful	☐		Very useful	☐
Paramount	☐		Paramount	☐

The importance of system's capabilities in relation with providing assistance/support

(Q17) Please rate, in your opinion and according to your experience, the importance of the functionalities (or capabilities) described in the following scenarios, with a view towards facilitating the delivery of your caregiving services to the elderly found in your care.

		Very important	Rather important	Slightly important	Not at all important
a)	Having an **automatic alarm triggered in case of falling,** that calls for help?	☐	☐	☐	☐
b)	Having an **automatic door lock accessible to caregivers and rescue services** in order to provide help and support in case of an emergency?	☐	☐	☐	☐
c)	Having the elderly wearing a **small box (mobile phone size) for most of the time i**n order to get help for they most important needs	☐	☐	☐	☐
d)	Having **video cameras in elderly's house?**	☐	☐	☐	☐
e)	Having **a screen installed in elderly's house which can be used for information and communication?**	☐	☐	☐	☐
f)	Having **various sensors installed in the house** (e.g. the size of small boxes installed on/in the walls)**?**	☐	☐	☐	☐
g)	Having the elderly citizens **wear a fall-detection sensor?**	☐	☐	☐	☐
h)	Having **a small monitoring camera the elderly's living room?**	☐	☐	☐	☐

Instructions for items i) – l), bellow.

If not applicable (i.e., if you cannot think of some other device or functionality or capability), please do not rate this item, or the items bellow.

i)	Other devices / capabilities / functions which you may consider useful.	☐	☐	☐	☐

Name here the item you rated at step i)
……

j)	Other devices / capabilities / functions which you may consider useful	☐	☐	☐	☐

Name here the item you rated at step j)

……

k) Other devices / capabilities / functions which you may consider useful ☐ ☐ ☐ ☐

Name here the item you rated at step k)
……

l) Other devices / capabilities / functions which you may consider useful ☐ ☐ ☐ ☐

Name here the item you rated at step l)
……

Technology acceptance

Column A: How easily do you operate the following devices?

Column B: How pleasant is for you to (have to) make use of the following devices?

Scoring instructions for columns A ÷ B

A 0 = impossible or extremely difficult, 1 = rather difficult, 2 = rather easy, 3 = very easy

B 0 = impossible or extremely unpleasant, 1 = rather unpleasant, 2 = rather pleasant, 3 = very pleasant

Scoring procedure: insert the rating/score number, on each column, according to rating scale intervals

	Device	(A) (Q18) Ease of use	(B) (Q19) Pleasure to use
a)	Mobile phone	.	.
b)	Smartphone	.	.
c)	Notebook / Laptop / PC	.	.
d)	Tablet or other touchscreen devices	.	.
e)	Video interphone	.	.
f)	Refer to any other device you consider important	.	.
	If other, please specify here which:		
	.		
g)	Refer to any other device you consider important		
	If other, please specify here which:		
	.		
h)	Refer to any other device you consider important		
	If other, please specify here which:		

.

i) Refer to any other device you consider important

If other, please specify here which:

.

Technology preference

(Q20) What kind of device would you prefer for elder guidance and contact?

☐Mobile or smartphone

☐Notebook / Laptop / PC

☐Tablet or other touchscreen devices

System's perceived usefulness

System's usefulness in relation with specific area of caregiving assistance

(Q21) To what extend an assistance of a support system would be helpful for you in the following tasks:

Rate choosing one answer from the columns at right side or check on the column "Not applicable for me" if you don't provide that specific support.

		Not at all useful 0	Slightly useful 1	Rather useful 2	Extremely useful 3	Not applicable for me
a)	Help with errands outside the house (shopping, invoice payment, etc.)	☐	☐	☐	☐	☐
b)	Help with moving inside the house	☐	☐	☐	☐	☐
c)	Cleaning	☐	☐	☐	☐	☐
d)	Cooking	☐	☐	☐	☐	☐
e)	Personal hygiene	☐	☐	☐	☐	☐
f)	Dressing	☐	☐	☐	☐	☐
g)	Health related (e.g., supervised gym, measure health parameters, etc.)	☐	☐	☐	☐	☐
h)	Reminders	☐	☐	☐	☐	☐
i)	Reading books, TV subtitles	☐	☐	☐	☐	☐
j)	Other:	☐	☐	☐	☐	
	If other, please specify bellow which:					
	.					
k)	Other:	☐	☐	☐	☐	
	If other, please specify bellow which:					

.

l) Other: ☐ ☐ ☐ ☐

If other, please specify bellow which:

.

Location monitoring effectiveness

In order for virtual assistant to be effective, it may need to monitor, by video or by sensors, several of your living areas. How usefully would it be for your services if it surveys your elderly client's:

Living area	(Q22) Video monitoring	(Q23) Sensor monitoring
a) Sleeping room	.	.
b) Living room	.	.
c) Kitchen	.	.
d) Bathroom	.	.
e) Balcony	.	.
f) Yard	.	.

Rate choosing from 0 = no use at all, 1 = slightly useful, 2 = rather useful, 3 = very useful

System's usefulness in relation with relation with generic aspects of caregiving

(Q24) **Should a virtual assistant such as the one envisioned in this project be available to you as a caregiver, please rate its usefulness, considering the following areas of implementation** (such as in facilitating various aspects of you work)**:**

	Not at all useful	Slightly useful	Rather useful	Very useful
In relation with the elderly citizens to whom you provide caregiving services	☐	☐	☐	☐
In relation to you company or institution that offers caregiving services	☐	☐	☐	☐
In relation to other institutions or companies that offer tangent, related or complementary services for the same elderly citizens which are also your clients	☐	☐	☐	☐
In relation to the elderly citizen's relatives or family or support group, which are interested in their wellbeing	☐	☐	☐	☐
In relation to any other entity or person which you consider important for your clients' wellbeing	☐	☐	☐	☐

General appreciations of usefulness

In addition to the above questions pertaining to certain specific situations, please try and give some more insight as to:

Please, complete on the lines bellow, in your own words.

(Q25) 1) How useful would you consider such a system to be for improving the quality of life of the elderly and why?

_____

_____

_____

_____

(Q26) 2) How useful would you consider such a system to be for improving your work results (your work efficiency) with the elderly and why?

_____

_____

_____

_____

_____

_____

(Q27) 3. How useful would you consider such a system to be for assisting you to perform care-related tasks and why?

_____

_____

_____

_____

_____

_____

Further participation

(Q28) Would you be willing to answer more questions from us regarding similar issues, one more time, in the future? YES ☐ NO ☐

(Q29) If you chose NO, please explain here why

.

(Q30) Do you agree to try and test some of NITICS solutions? YES ☐ NO ☐

(Q31) If you chose NO, please explain here why

.

(Q32) Is there anything at all that you would like to add regarding our project or any of the topics discussed above or which you feel that would be important to consider?

- End of document -