

ICT for ageing well:

Listen to what
older persons think!

"At my age it is
very difficult to
understand
technology"



"And what about the
costs? The devices
aren't really cheap
and they are fast
outdated so they
need to be replaced
again"

"It is good to
have someone to
talk to, to know
someone cares"

"Using the devices
drew attention to the
fact that I was letting
myself get a little
bit overweight and
now I feel healthier"



Home Sweet Home

February 2014



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1.Introduction

This publication presents the outcomes of a small qualitative study that took place in the frame of the European Union-funded Home Sweet Home project. It aims at shedding the light to barriers and enablers for the acceptance of new technologies that are introduced to help older persons live autonomously and manage better their health. It is written from the perspective of older persons who use technologies in their everyday living and it is addressed to all the stakeholders who are involved in the development and deployment of such solutions: researchers, service providers, industry and SMEs, public authorities, health and social care professionals, informal caregivers, insurers and mutualities and older persons themselves. Instead of discussing elements specific only to the project, the publication is drafted in a way that can be useful to various similar settings and sets of services.

First, some basic information about the project and the study is provided. Then the results of the study are summarized as answers to the questions: who are older persons and what matters to them? In the end, recommendations for future research and practice are given, before presenting the case studies (narratives), which were analysed in order to reach conclusions and lessons learned.

In the following pages, some abbreviations are frequently used, which are presented in the following table to facilitate the reading:

AGE	› AGE Platform Europe
BPM	› Blood pressure meter
COPD	› Chronic obstructive pulmonary disease
GP	› General practitioner
HSH	› Home Sweet Home project
IBS	› Irritable bowel syndrome
ICT	› Information and Communication Technologies

›About the Home Sweet Home project

The Home Sweet Home (HSH) project brought together a set of services, which aimed at extending the independent life of older persons in their home environment, improving their feeling of safety and proposing digital ways for enhancing their social inclusion. In addition, the HSH services were foreseen to facilitate the management of chronic conditions in a home setting and reduce medical expenses while boosting overall quality of life. This solution was tested in real life trials in four countries: Italy (Latina), Belgium (Antwerp), Ireland (Louth) and Spain (Badalona).

The four pilot sites aimed at verifying the impact of the set of services on economic and clinical indicators, its financial sustainability and the satisfaction of users. Using a clinical trial methodology to ensure credible outcomes, HSH attempted to refine the business case in view of a large-scale deployment.

› About the technology

HSH planned to deploy the following technologies:

- › **InTouch:** a touch-screen computer including a portal which connects all elements of the Home Sweet Home technology. Its main function is to gather and display all the information and measurements from the HSH services (both medical and environmental). Participants have access to this information on the portal. This computer also integrates a daily planner and a set of cognitive games (see below).
- › **Daily Planner:** a calendar integrated in the computer of the InTouch, which can serve as a reminder for medical appointments and medication uptake. The interviews did not allow for a thorough evaluation of this service as very few participants referred to it separately. In fact, only the Call Centre could update the Daily Planner, as a result it was essentially unusable.
- › **Cognitive games:** The games serve as memory training, as well as an entertainment activity for participants. This service is integrated in the computer with the InTouch.
- › **Weight Scales:** One of the main vital monitors included in the HSH system aiming to monitor the weight of the participants and transferring relevant data to the portal.
- › **Blood Pressure Meter (BPM):** Another medical measurement tool which serves to monitor blood pressure levels, using an arm band.
- › **Pulse oximeter:** A pulse oximeter is used to measure a patient's blood-oxygen saturation level and pulse rate.
- › **Glucometer:** The glucometer is used to monitor sugar levels in the patient's blood.
- › **Mambo:** A mobile phone with several extra features, such as a built-in GPS and an alarm button.
- › **Ello:** A technology integrated with the participants' TV, allowing having videoconferences with selected contacts. Similar to Skype but on TV.
- › **Smoke detector:** A sensor which can detect smoke and fires by generating alarms.
- › **Water detector:** A sensor which can detect water leaks, e.g. in the bathroom when sink or bath overflows.
- › **Motion detector:** Sensors which can detect falls or abnormal (in)activity and generate related alarms and liaise with a call centre.
- › **Temperature/humidity sensors:** Sensors which monitor the climate of the living environment.
- › **Homatic devices:** These are smart home features integrated in the domotic environment, such as doorknobs, windows and radiators, for example to open doors and windows and adjust heating. These services were not implemented in any of the participants' homes, as the infrastructure was unsuitable for the installation. Therefore, the qualitative study does not offer any further insights on their utility and acceptance.

› About the Advisory Board

Experts comprising the HSH Advisory Board observed and had real contact with the older persons and professionals experiencing the HSH technology through visits to the project's pilot sites; they contributed to a number of documents prepared by the HSH consortium providing a critical point of view to the project development, and actively participated in a number of events and dissemination activities. The experts aimed at bridging gaps between research and practice and at highlighting ethical concerns and issues of user acceptance. The work of the Advisory Board was crucial in providing long-term perspectives to the project outcomes. The following people were involved in the Advisory Board, which was managed by AGE Platform Europe, as partner of the HSH consortium:

- › **Angela Cluzel, European Association for Directors of Residential Care Homes for the Elderly (E.D.E.)**
- › **Fausto Felli, Equity in Health Institute, Institute for Quality of Life, Italy**
- › **Heidrun Mollenkopf, BAGSO, Germany**
- › **Claus Nielsen, DELTA Business Development, Denmark**
- › **Marja Pijl, European Association working with Carers (Eurocarers)**
- › **Philippe Swennen and Blandine Cassou-Mounat, International Association of Mutual Benefit Societies (AIM)**
- › **Barbro Westerholm, Swedish Association For Senior Citizens, Sweden**

› Why such a study

"In view of the small number of participants and the high number of drop-outs in the pilot sites, it would perhaps be methodologically more valid to carry out a few case studies, representing a number of differing 'typical' older persons, giving in-depth background information on their social and economic resources, biography, health status and attitudes. This might better explain why they like to use and adapt to technology or have difficulties to use or even reject it"

Heidrun Mollenkopf, AGE Expert, HSH Advisory Board Member, on the occasion of the visit to the HSH pilot site in Antwerp, Belgium, December 2012

During the visit of the HSH Advisory Board to the pilot site of Antwerp, Belgium, in December 2012, the experts suggested that undertaking a qualitative analysis would be very interesting in a project like HSH as a way to enrich the statistical data and get a better insight into the personal factors that have affected the users' appreciation of the devices used in the pilots, before implementing them on a larger scale. Although such a task was not initially foreseen in the project work programme, the HSH partners agreed on the usefulness of such an additional activity in order

to harvest experiences and histories of end users and to strengthen the HSH deliverables, results and implementation experiences. This analysis was planned to complement the statistical data shedding light on the background and context in which different users interact with the HSH services, which could be used to extract a list of barriers and/or of facilitators to the take up of technology.

The questionnaire used for the interviews was drafted on a voluntary basis by two members of the Advisory Board, Ms Heidrun Mollenkopf and Ms Marja Pijl. Then a small working group was established comprised by the two Advisory Board members and Nena Georgantzi and Ophélie Durand from AGE Platform Europe, in order to guide the study and deliver the expected results. The HSH management team overlooked the work on the qualitative study and was in charge of the communications with the pilot sites.

In order to gather variable but also comparable data, pilot sites were requested to select users with diverse characteristics, in terms of e.g. health and social condition, professional background, familiarity with technology and acceptance of devices. Interviews took place between 27th September 2013 and 7th November 2013. In total 18 people were interviewed for the qualitative study; five from Antwerp, eight from Badalona and five from Louth. No interviews took place in the pilot site in Latina.

Out of the 18 interviews, nine cases were analysed in depth, three from each pilot site. For the selection of these cases the working group identified the most interesting and characteristic cases on the basis of minimal/maximal common ground, which is participants with similar backgrounds but different reactions and participants with different backgrounds and similar answers. The focus was on motives, considerations, feelings, experiences and changes mentioned by interviewees. Attention was also given to present cases from all pilot sites and to attain a relative gender balance.

The table below presents the individuals interviewed, highlighting the analysed case studies, which can be found in section 5.

Pilot site	Sex	Age
Louth (IE)	female	85
	female	79
	male	80
	female	71
	male	78
Antwerp (BE)	female	91
	male	75
	male	73
	female	87
	male	72
Badalona (ES)	female	70
	female	80
	female	72
	female	73
	female	81
	female	86
	male	83
	female	80

2. Who are the users?

"Older people are a totally heterogeneous group and that is a vital point to learn. You have those who continue to decide on their daily living and those who at the same age have given up. You have those who will grasp the remote control and flick through the channels and those who leave it in the drawer preferring to push the button"

Angela Cluzel, AGE Expert, HSH Advisory Board Member, on the occasion of the AALIANCE Final Conference, Malaga, March 2010

This study has reaffirmed the heterogeneity of the target group and the fact that there is no one-fits-all solution. Nowadays old age can span 30 or 40 years so putting everyone in one same basket is simply not relevant. Not all older people are frail and impaired. Neither is everyone interested in ICT. Personal constraints related to ageing, such as gradual loss of sensory abilities (hearing, eyesight, taste etc.), physical impairments (speech, dexterity, mobility, strength, endurance, etc.) and cognitive and intellectual problems (memory loss, information processing, etc.) impact on the interest and ability to engage with new technologies and the confidence in using them.

Older persons may live in private homes, sheltered housing or social flats, alone or with other family members, or in various types of residential or long-term care institutions, or in other assisted living settings. These living arrangements form the context in which services are offered and are very important aspects to its uptake. In addition, the opinion of the family, friends and other people the individual is in contact with and trusts, such as doctors, social

workers, or carers, can influence people's feelings towards technology. Personal experiences, like biographical background, health status, familiarity with technology, and expectations are also relevant. If experiences with the service are positive or expectations are confirmed, people are more likely to use technical services in the future. Being approached by people who participants know personally and trust makes a difference. Also, the 'authority' of the contact person, can play a role in participants' motivation. For example if the contact person is a doctor, health benefits are likely to be expected.

In sum, when innovating and introducing new technologies we should not only think of individuals but of systems: the living, social, political, legal and technological environment of the person has an impact on his/her attitudes. Older persons are not a uniform target group but individuals with diverse needs, wishes and expectations.

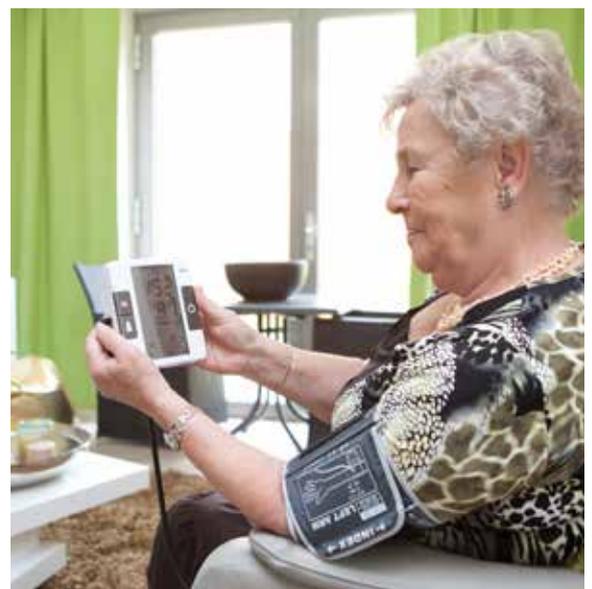
› Is there an ideal user?

“I grow old learning something new every day”

Solon (c.639BC – c.559BC)

In this study we tried to identify the profile of the model user of ICT solutions and we made the assumption that the ideal user 'has experience in technology, likes it and is not startled when things do not work as they should'. We moreover found out that people who are not very interested in technology are likely to use the devices once they experience the benefits provided. Besides, familiarity and interest in technologies may facilitate acceptance but do not necessarily mean active use of the devices. In other words, an interest in new technologies does not equal the uptake of services. Some people may just see devices as gadgets. In fact, in this study we have seen technology act both as an enabler and as a bottleneck: for some people, engaging with it is difficult, whereas for others it is the main reason for accepting the solution in the first place (i.e. people who are interested in technical aspects of project).

The conclusion arising from these observations is that the openness to learn and adopt new things is essential in the process of introducing new technologies to an older person's home. The pure expectation of health and social benefits often is not a sufficient motivation to accept ICT, unlike what some may think. Even if future generations will be more technology-literate, there will always be 'tech freaks' ready to try anything new and people who have difficulties or do not want to adapt to new media and devices.



› What are older persons' experiences and views on technology?

"At my age it is very difficult to understand technology"
(Female, 81 years old, Badalona)

"Some of the other men in the Men's Sheds group have smartphones and they can get all this information on it and I regret not being more knowledgeable about technology"
(Male, 80 years old, Louth)

"My daughters made me participate...they thought it would be good for me because of the cognitive training"
(Female, 70 years old, Badalona)

"I have little interest in technology, but I won't try to avoid it either"
(Female, 91 years old, Antwerp)

"The doctor convinced me that it would be good, as I live alone"
(Female, 81 years old, Badalona)

"I think it's the future of life. Look at the phones...when I was young the phones did not exist and now we are all under control"
(Male, 83 years old, Badalona)

"Older people are being surpassed by technology and they can't follow it"
(Male, 72 years old, Antwerp)

"My family thought it was a great idea since you wouldn't have to go to a nursing home and you can be at home for years"
(Male, 78 years old, Louth)

"I like reading more than using technical devices"
(Female, 87 years old, Antwerp)

"Technology is good, if people are given the equipment at an age where they can learn it, but if someone has problems with their memory, it wouldn't work. Some people are afraid of their life with technology"
(Female, 71 years old, Louth)

3. What matters to older persons?

The main findings of the study are presented in this section under five main questions from the perspective of older users of ICT for ageing well.

› Do I need it?

“Smart gadgets aren't enough: we need to use them. We need to roll those ideas out into the real world and start making a difference to people's lives”

Neelie Kroes, Vice-President of the European Commission responsible for the Digital Agenda, on the occasion of AGE General Assembly, Brussels, May 2013

For half of the participants in the study, the willingness to help others (such as researchers and project staff) and contribute to project objectives was one of the main reasons to take part in the project. Three people mentioned the project goal as a concrete motivating factor, whereas four said that they were curious or just wanted to try something new. Only four participants mentioned expected health improvement as a reason to take up the technology. It is thus obvious that for a large proportion of the participants other motives and external influences were more powerful than a recognised need for ICT-support, even if 11 out of 18 interviewees were suffering from an ailment or chronic illness. Interestingly enough, even people who do not want to keep the devices are willing

to recommend it to others. This illustrates the **difference between experiencing and understanding the benefits of technology and acknowledging a need and wishing to adopt the service**. This is an important finding: the willingness to help the project (altruism) will not appear in real-life situations and will perhaps impose further challenges in user acceptance. Moreover, this sets an important ethical question: such solutions should not be imposed without offering alternatives (i.e. more traditional methods of care and support).

More concretely, whereas all the components of the HSH platform that were implemented proved to be relevant in some way, different aspects were useful for every participant. For example, many participants were not interested in the Mambo and preferred to use their own mobile phone. For a few however, the Mambo was the most interesting aspect of the service and the one they would like to keep. Besides, this study showed that duplication of already available services and lack of ‘interoperability’ hinders acceptance. For instance participants already using a glucometer given by their doctor may be less likely to change to the new one, especially if their doctor does not accept measurements from the provided device (i.e. the participant would have to use two devices). Moreover, duplication can create confusion and stress as different devices may give different measurements.

Tele-health solutions are likely to have more of an added value to older persons who live alone, without access to similar health and tele-monitoring services available. They seem less important for persons who are in regular direct contact with a doctor or nurse anyhow or those who live in sheltered housing. In addition, some users experience interesting side effects thanks to the exposure to new technologies: interest

to start computer classes, benefit from the internet for other purposes, more frequent contact with staff or family to help with technical problems or difficulties to use the devices, use of the teleconference system to facilitate contacts with family and friends living away etc. In fact, when the project ends, **many people will not miss the technologies; instead, they will miss the chats with the people who call and visit to collect data and demonstrate the devices.** All these expected and/or experienced benefits are unrelated to health-related needs. The social component should not be neglected.

These observations confirm the need to tailor the solutions to the specific needs, expectations, lifestyle, preferences and routines of the individual in order to avoid duplication and ensure that the offered services are used by the consumer. It would therefore be safe to conclude that **the study builds a strong case for a personalised set of services.**

"I was hoping not to get the devices (i.e. be involved in the control group instead of the study group) since I didn't feel the need for them...I live in a sheltered housing and only have to press a button to have someone up here in 5 minutes, which is a big difference with the Mambo, where they first start to ask questions and it takes much longer before somebody will arrive to help you"

(Female, 87 years old, Antwerp)

"I will miss the project terrible when it's finished, I had the equipment for so long now"

(Female, 85 years old, Louth)



"I can do without the healthcare technologies and wouldn't miss the end of it... My bloods are closely monitored by the doctor so the devices aren't as necessary for me. I would miss the visits and the calls however"

(Female, 79 years old, Louth)

"I will definitely miss the internet and knowing that there is somebody on the other side, because it's nice to know"

(Female, 71 years old, Louth)

"The technology can be helpful, especially to doctors to take care of patients"

(Female, 86 years old, Badalona)

"I will miss the chats with those who called when looking after the equipment"

(Male, 78 years old, Louth)

"I will miss part of the games and the questions...they entertain me"

(Female, 81 years old, Badalona)

"I don't use the Mambo at all, even though I like it, since I don't leave the house"

(Male, 83 years old, Badalona)

"I'm going to miss the scales and the blood pressure meter because I find them useful so I can follow up the values and give the values to my GP"

(Male, 73 years old, Antwerp)

"I will miss the control of these cameras in case I fall when I am alone at home"

(Female, 80 years old, Badalona)

"I cannot wait to take them (i.e. the devices) out. There are many obstacles, many cables, many devices and in any case I don't use them"

(Female, 70 years old, Badalona)

› Can I use it?

"In a society driven by new technologies, it is essential to make sure new applications are accessible to all, in order to avoid increasing the digital divide and the social exclusion of the most vulnerable groups of the population"

Anne-Sophie Parent, AGE Secretary General, on the occasion of the Vodafone Smart Accessibility Awards, December 2011

People involved in the HSH trials have encountered various difficulties in using the devices provided, due to their complexity, lack of accessibility or users' little familiarity with new technologies. Luckily in the frame of the project training was provided in the beginning of the trials and follow-up demonstrations took place until participants were able to use the devices on their own. But even then, support was needed because technology was not working well, because participants could not open the battery compartment or because they failed to take their measurements. Intervention by the staff or help by members of the family was common in all pilot sites.

The study confirmed that **implementing technologies has to be accompanied by social services, ongoing training, and long-term technical support**. Such support should be an integral part of the package offered. It is important to explain to users both how to use the equipment and why

they have to carry out the various actions, as capacity to understand is one thing and capacity to memorize is another. This is important for users to engage with and gain confidence in the services.

User-friendliness and accessibility should be at the heart of innovation. Although future generations will be more ICT-literate, as technology evolves, there will always be older persons less confident about their physical and mental capacities and more hesitant to learn new skills and adapt to new media.

"I only use the devices when my daughters come to visit, once a week"

(Female, 70 years old, Badalona)

"In case of defect or flat batteries I can call the occupational therapist"

(Male, 75 years old, Antwerp)

"The blood-pressure meter is difficult to place in the arm"

(Male, 83 years old, Badalona)

"In the beginning I was anxious about the equipment and about using it. But with practice and demonstrations I got used to it and now I feel more confident although it took a while in the beginning to get used to it. It needed trial and error: Just fiddle around with it and find the right way to work [the devices]"

(Female, 79 years old, Louth)

"I use the scales every day; they are not difficult to use so I can do it on my own"

(Male, 73 years old, Antwerp)

"The Mambo is heavy and instead I use my mobile phone..."

(Female, 72 years old, Badalona)

"In the beginning I referred to the manual to figure out how to use some of the devices, but practice makes perfect"

(Female, 85 years old, Louth)

> Can I trust it?

"Many older people do not have someone in their social network that is able to help them with the installation of new equipment, teach them the necessary skills and help them when they have problems. Older people looking for assistance can easily fall in the hands of crooks: people who do not know what they are doing or who charge unnecessarily high fees. If you have had bad experiences and have no trustworthy person to help you this can be a barrier to the use of ICT"

Marja Pijl, AGE Expert, HSH Advisory Board Member, on the occasion of the AAL Forum, Odense, September 2010

The study showed that technology which is performing poorly or encounters many failures cannot be expected to be accepted by older persons. **The equipment must be thoroughly tested and completely reliable before it is given to older persons.**



Relying on new machines that older persons do not understand and that they do not trust 100% makes them feel unsafe, especially since serious health conditions add tremendously to their feeling of insecurity. Older persons want to be sure that they can get immediate help and that they can reach medical staff in case of an emergency. They wish to have back-up plans and support in case technology does not work. Unconfirmed expectations and confusing outcomes can create frustration and barriers to acceptance. **Trusting the service offered is a process that takes time and effort.** Testing the devices for some time before adopting them, allows older persons to experience the benefits of technologies can help them gain confidence in using and start liking them.

"I used the glucometer for a while but returned it shortly after as it was not giving the same readings as my old one"

(Female, 85 years old, Louth)

"I thought it was a pity that the blood pressure meter did not work anymore and had to be replaced but in a trial project you expect such a thing"

(Male, 73 years old, Antwerp)

"I never had to use the Mambo, but it is always plugged in. In the beginning I used to test it by pushing the button... I do not really like it; I am afraid some of the grandkids could come in and push the button, putting out an SOS!"

(Female, 85 years old, Louth)

"At first I thought that I could not use the equipment at all, but now – after all this time – I have lost the fear"

(Female, 72 years old, Badalona)

"When the blood pressure meter wasn't working properly, it was no bother at all because the nurse would take my blood pressure regularly anyway"

(Female, 79 years old, Louth)

"The values weren't stable; I am disappointed it has never worked correctly"

(Male, 72 years old, Antwerp)

"I don't like the fire alarm because it sounds at all hours. I had to put a cloth because it whistled all the time...I don't want to disturb my neighbours and I get nervous when it rings"

(Female, 72 years old, Badalona)

> Can I afford it?

"My life has changed since I became a pensioner. My total monthly resources amount to 600 euros. I live near the city centre and a housing allowance covers my rent. My resources do not allow me to do what I want..."

Personal testimony by Ms. Maryse Martin for AGE publication 'Older people also suffer because of the crisis', November 2012

Willingness to keep the devices provided in a project does not necessarily mean willingness to pay for it in real life conditions. Many of the participants involved in the



study (10 out of 18), would not be willing to pay for the equipment whereas for those answering yes, the willingness to pay would depend primarily on the price. Most participants in Badalona (7 out of 8) are not willing to pay anything. The main reasons for this are that they see no need, they do not use the devices or they do not have enough money.

The study reveals that cost remains one of the most important reasons of the divide.

Buying the basic equipment is one side of the coin; the costs for the installation, the maintenance, internet access and energy consumption, the emergency support and the other services offered are hidden barriers to the uptake of technologies beyond the lifetime of the project.

Although there is insufficient analysis of the economic aspects of the project, it appears unlikely that users would pay for the totality of the costs incurred for the service offered. Besides the quite high levels of poverty amongst older people in need of care, another reason for this may be the expectation for such services to be covered by the social protection system. Affordability and repartition of costs among the individual, the state and the private sector should be central in the debate about wider deployment of such services.



"It depends on how much it would be. I live alone, I only have the pension and no other income at all, and I also have to pay all the bills. I would be willing to pay € 10 a month for it, but I would have to give up something to continue keeping the service"

(Female, 85 years old, Louth)

"Of course I would not pay for it, I am a pensioner"

(Female, 70 years old, Badalona)

"And what about the costs? The devices aren't really cheap and they are fast outdated so they need to be replaced again"

(Female, 87 years old, Antwerp)

"I do not think I would be able to afford it because I have to pay for a lot of prescription tablets and I have to get my bloods done regularly; on top of this I live alone and I have to pay the heat, light, phone, gas, etc. bills myself"

(Female, 79 years old, Louth)

"I like technology, but you see I am so old to buy this kind of things"

(Female, 81 years old, Badalona)

› How will it change my life?

"It is possible to install gadgets, gizmos, call them what you like that can monitor blood pressure, heart rate, sugar content – all quickly and discretely, and relay that information miles away on a regular basis to doctor's surgeries or other medical establishments. One can monitor habits and movement. The question is how good is all that? Is it Inclusion or Intrusion?"

Peter Rayner, AGE Expert, on the occasion of the Housing Adaptations Scotland Conference, Glasgow, June 2013

An important part of the study was dedicated to changes that participants noticed during the installation of the devices in their homes: personally, in their environment, in their routines and in their relationships with others. **The study showed that the provided services can help some people become more health-aware and active, improve their quality of life or increase their feeling of safety.** Nevertheless, not all users experienced such positive changes.

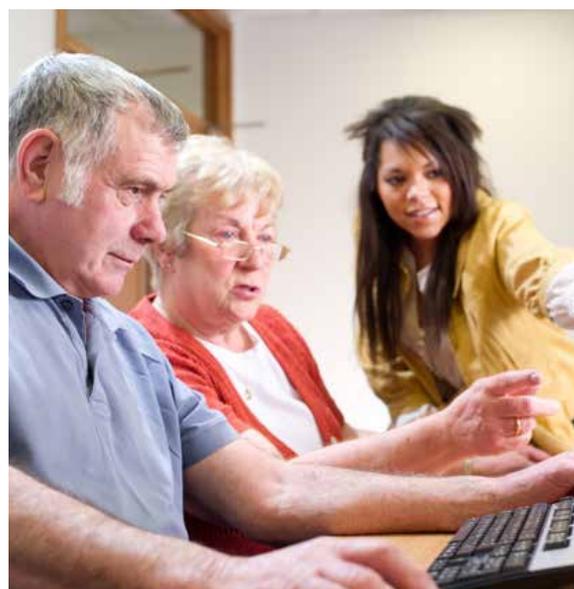
According to the answers received, the aspect where participants are more likely to see a change is in their feelings. In most of these cases, feelings changed in a positive way, as participants feel safer, more relaxed, better health-wise, more confident in the use of devices or convinced about

their usefulness. Whereas no considerable changes with family relations were noticed, some participants mentioned that their family members now felt more reassured, and in two cases there was an increased contact either to help with the use of devices or thanks to the internet connection. Additionally, the questionnaires revealed that **the introduction of technology may include important environmental changes in a person's home, which the user is not always willing to accept, regardless of the expected benefits.** Indeed aesthetics play an important role for some participants who for example do not like the wiring or the space taken over by the equipment. Besides, even if technology can make some things easier, attention should be given not to create extra barriers or burden to older persons stigmatising them as dependent and frail individuals, asking them to adapt their everyday living or take risks, for example compromising their privacy. Research on the ground is helpful to understand older persons' everyday problems and respect their routines.

One of the most interesting findings is that, in the question which relates to the main changes noticed throughout the project, the most commonly cited change is the increased contact with the project team (five out of 18 participants). This appears to be important for participants, not only with respect to the services offered but also in terms of social contact, in particular to combat loneliness and feel more secure when living alone. **Some participants will miss the contact with professionals when the project ends and others even fear the loss of human contacts because of the introduction of ICT.** These observations are very important as they disprove the assumption that the deployed ICT solutions can improve the social inclusion of older persons. At the same time we have witnessed a paradox: although the HSH

services were foreseen as an alternative to regular medical visits and increased health care costs, the more the visits and calls by the staff (in particular to deal with technical problems) the happier the participants were.

Moreover, while health consciousness in this study was cited as a positive outcome, there may be an inherent risk for rejection of the solution if the service becomes too medicalised and users are not willing to be confronted with their problems every day. This important ethical issue remains yet to be explored. Last, there is insufficient evidence on how far ICT can help the most vulnerable and frail older persons, such as persons suffering from depression or dementia.



"Using the devices drew attention to the fact that I was letting myself get a little bit overweight and now I feel healthier monitoring my own health and weight with the BPM and scales"

(Male, 80 years old, Louth)

"I live alone and now I feel safer at night having the mambo to contact someone if I need it"

(Female, 79 years old, Louth)

"At first I was very angry and I was going to leave. The cleaning lady could not clean because all the wires were in the way. I called the doctor and the technician and they came and fixed it, but I was still going to leave. My daughters did not want me to, but I could not bear all these wires, because the cleaning lady did not clean as she didn't want to move the equipment"

(Female, 70 years old, Badalona)

"It's like those little gifts that you receive from somebody and that you can't put away but that you find terribly ugly"

(Female, 87 years old, Antwerp)

"I feel good about the changes because I knew that my blood pressure was up, but now when I can take it myself and it is normal, it makes me come down the stairs in good humour"

(Female, 85 years old, Louth)

"The main change was the visits by the project team, which is good because I am alone a lot of time. Besides, now I feel more secure because sometimes they call me to know how I am"

(Male, 83 years old, Badalona)

"It didn't really make a big impact on my life, or what I was doing, because as you can see I'm very active anyway"

(Male, 80 years old, Louth)

"It is good to have someone to talk to, to know someone cares"

(Female, 71 years old, Louth)

4. Conclusions and recommendations

The experience of the qualitative analysis in the frame of the Home Sweet Home project has generated the following conclusions and recommendations about the development and deployment of technological solutions for older persons.

Regarding future research:

- › Foresee both quantitative and qualitative analysis as both methodologies provide particular insights. Sufficient time and resources should be allocated to enable making links between the two.
- › Expert groups (such as the Advisory Board of HSH) should have an important role in future research projects about reading, reviewing and ensuring synergies between different deliverables.
- › Include interviews with the staff of the trials to gain insights on the challenges they face regarding their acceptance of technologies and make links with answers provided by participants.
- › Document in detail what has changed in the course of the project, in particular, how has user involvement, advice by experts or lessons learned changed the development of the technologies and services.
- › Explore whether assistive technologies are imposing a medicalised lifestyle to participants.
- › Research how (far) technology can help the most vulnerable older persons: those socially excluded, suffering from dementia or depression.

Regarding technological innovation

- › Develop sets of solutions that can be tailored to the needs, expectations, lifestyle, preferences and routines of the individual.
- › Observe how and where people live to avoid developing solutions that cannot be used in real-life situations.
- › Ensure that solutions are reliable before exposing them to users.
- › Make solutions robust, attractive and practical, taking due account of energy provision and challenges related to change of batteries.
- › Opt for mainstream solutions, integrated – as far as possible – to a single device.
- › For health and safety-related devices a back-up should be available in case technology fails.
- › Affordability should be at the centre of technological innovation for older persons.

Regarding financing

- › Although many of these technologies were conceived to reduce the need for personal contact with carers and health professionals, the study has shown that users highly appreciate the contact with the staff involved in the trials. Perhaps these technologies would be more acceptable as a tool to improve the work of health professionals and the quality of life of older persons, rather than a way to save on resources. Further analysis is needed.
- › The quite low willingness to pay shows that an individualization of the cost is probably not the way forward. Different financing models should be explored.
- › Costs for training, technical support and maintenance should be part of the package.

5. Case studies

The case studies aim to provide insights on different types of users, taking into account their background, experiences, social context, health status and living environment. The objective is not to generate generally applicable conclusions – the small number of cases does not allow for generalisation – but rather to highlight some important aspects, which should not be overlooked in future projects and wider deployment of relevant services. This is why they provide observations and not conclusions. Nevertheless, based on the analysis of the case studies, the overall synthesis of the interviews and the experience of the Advisory Board during the pilot site visits, this publication presents some lessons learned and recommendations, as presented in the previous section.

While the same structure was applied to all these case "stories", they were drafted by different people, which explains the different writing style. Naturally, for data protection and privacy purposes the names chosen for the case study participants are pseudonyms.

Case Study 1:

Ms Maria Garcia (Badalona)

Ms Garcia is 70 years old and widowed. Although one of her daughters came to live with her in March 2013 (after the beginning of the project), Ms Garcia spends most of the day on her own. She lives in a flat on the 8th floor in an urban area with easy access to shops and services. She has completed primary education and has no previous interest or experience in technologies.

Ms Garcia suffers from COPD, is treated by a psychiatrist for depression and is also in close contact with several specialists. She

feels bad about her current situation and discouraged to do anything to change it. She mentions: *"I cannot go outside. I choke when I take two steps. Also, I've gained weight. And that does not help me. But... I do nothing during the day. I'm home all day watching TV ... and eating... My daughters do not want me to do that, they want me to take a walk, go on a diet, ... but I have no encouragement"*.

Ms Garcia was not interested in the project, neither in new technologies and therefore lacked personal motivation to join the trial. *"You know I did not want to participate... My daughters made me join"*, she mentions. She explains that her daughters were interested in the devices and thought it would be good for their mother, especially the cognitive training.

Using the devices

Ms Garcia is not an active user of the devices; she never uses the Mambo, Ello and the daily planner and she almost never uses the weight scale. *"I do not know what my weight is"*, she mentions. Moreover, she only uses the blood-pressure meter when her daughters are around, who are able to help her then. She likes this device because it allows her to keep a record of the measurements. She also likes the pulse oximeter, which she uses every time she chokes. *"It works better than the one I have"*, she says. Once there was a problem with its function and she called the doctor, but at the end only the batteries needed to be changed. It did not disturb her when it did not work, as she was still able to use her own. Ms Garcia also likes the cognitive games and uses them without help. However, *"I used them at first, but now I do not play much because I get tired... they are always the same, repeating..."*, she added. Ms Garcia likes all the devices that do not ask for active use by the participant, with the exception of the smoke detector, which

had to be relocated as it initiated false alarms when it was in the kitchen. In general, in case of failures, Ms Garcia contacts either the team or her daughters.

Changes resulting from the implementation

Ms Garcia was hoping that the devices would help her improve her health but she has not seen any improvements. The only changes she has noticed are in her apartment. She is very annoyed by the wiring of the devices: *"At first I was very angry and I was going to leave. The cleaning lady could not clean because all the wires were in the way. I called the Doctor and Jordi and they came and fix it, but I was still going to leave. My daughters did not want me to, but I could not bear all these wires, because the cleaning lady did not clean because she didn't want to move the equipment"*. She also mentions that her daughters now insist more on health care *"but not regarding the equipment, in general, in my life"*.

The future after the end of the project

Ms Garcia will not miss the devices. "I cannot wait to take them out", she says, since there are "many obstacles, many cables, many devices and in any case I don't use them". She is not willing to pay for the devices. "Of course not. I am a pensioner. I would not pay for them", she mentions. Overall, she thinks that technology is good and it could help others with health problems, as long as people use it "and have somewhere to put all devices and cables". But, "I'm too old and do not want problems or headaches..."

Observations

› Related to project planning:

- This case shows that when personal motivation is lacking, engagement of participants can be challenging.

› Related to the uptake of technologies and services:

- While Ms Garcia seems to understand the benefits of technology she does not actively use it.
- Changes in the environment impact on the acceptance of technologies.

› Related to older persons:

- Introducing technology to Ms Garcia has not helped her to cope with depression, inactivity and health problems.
- The case of Ms Garcia confirms studies which suggest that previous attitudes (psychological aspects) play an important role in the uptake of technology.

› Related to real life conditions:

- Ms Garcia has no interest in keeping the devices beyond the lifetime of the project and is not willing to pay for them.
- Ms Garcia is very disturbed by the wires.

Case Study 2:

Ms Rosario Morales (Badalona)

Ms Morales is 72 years old and widowed. She is living alone in an apartment on the 8th floor of a building with lift, situated in an area with many shops and easy access to services. She completed primary education and has been a housewife. Ms Morales shows a considerable interest in technology and she already uses a PC and a mobile phone. She is not suffering from any chronic illness or ailment, but she is on the list for bunion surgery. Luckily her condition does not mean any restriction to her, although her feet hurt and she is increasingly doing fewer things. *"Some days I am better, other worse, but not much has changed recently"*, she mentions. She loves to sing in a choral and this is a motivation to keep on being active.

She decided to take part in the project in order to collaborate with the medical staff in the study. She told her son about it, and he *"seemed fine"*. Her son lives in Barcelona and does not visit often.

Using the devices

She uses most of the devices without help with the exception of the Mambo, Ello and the daily planner, which she never uses. The Mambo is heavy and instead she uses her mobile phone. *"I don't know how to use it"*, she admits. She further says that Ello does not work. She also rarely uses the glucometer as she usually prefers her own. *"It is difficult to use"*, she says. Nevertheless, she likes it, since it is newer.

The blood pressure meter and the weight scale are used about once a week to control her weight and blood pressure. She also uses the cognitive games sometimes a week. *"I have memory problems, so I think it's useful for me"*, she mentions. She likes all the sensors with the exception of the smoke detector, which is too sensitive. *"I don't like it because it sounds at all hours. I had to put a cloth because it whistled all the time...I don't want to disturb my neighbours and I get nervous when it rings"*, she confesses. She continues: (When the alarm rings) *"to turn it off I have to climb on a chair or hit it with the broom"*. She often asks the staff for help on how to use the devices.

Changes resulting from the implementation

Ms Morales had no particular expectations when she joined the project and she has not noticed any changes in her social contacts. *"My kids do not come around here. I call them equally"*, she says. The only change in her apartment was that they had to change the location of the devices due to the wiring. *"Now in the living room is better"*, she says. In terms of change in her feelings, Ms Morales mentions: *"at first I thought that I could not use them at all, but now I have lost the fear, after all this time"*. The main change which has occurred during the years of her involvement in the project is the increased contact with the professionals.



The future after the end of the project

Ms Morales will not miss the devices as she is not willing to keep them, neither to pay for the service. *"I think they are so complicated"*, she says. She nevertheless would advise her friends to use them and she thinks that technology is the future. *"I am very happy with new technologies"*, she underlines. When asked about what would be a reasonable amount to be charged for using all the services, she replies: *"I don't know. I could not say a price. Maybe would I pay for the contact with professionals and the medical equipment"*.

Observations

> Related to project planning:

- Need to plan for technical support, training and contact with professionals.
- Being approached by people whom the older persons know personally increases the willingness to accept participation in a project.

> Related to the uptake of technologies and services:

- An interest in new technologies does not equal the uptake of services.
- Complicated devices create a barrier to user acceptance.

> Related to older persons:

- Experience with technologies can help older persons gain confidence in their use.

> Related to real life conditions:

- For Ms Morales the main component worth to pay for is the contact with professionals and the medical equipment.

Case Study 3:

Mr Eduard Marques (Badalona)

Mr Marques is 83 years old, single and living alone in a house in an urban area with easy access to shops and services. He has completed secondary education and he has a professional background with technological experience as well as a high interest in technology. His house is fully equipped with many technological appliances: TV, video, radio, cd, PC, etc. He does not suffer from any chronic condition or ailment, but he says: *"I'm not very well. Sometimes if I am sick I call the GP...I don't get out very much... I ask for the groceries to be brought home or neighbours bring me things"*. He decided to take part in the project to improve his health.

Using the devices

Mr Marques is not an active user of any of the devices. *"I have many things to do, I have no time"* he explains. Although he likes the offered services, he reports difficulties to use the blood-pressure meter and the Ello. About the Ello he says: *"I don't know how to use it... I would like to use the videoconferencing to talk with my American friends"*. He moreover explains that the blood-pressure meter is *"difficult to place in the arm"*. He does not use the Mambo at all, even though he likes it, since he doesn't get outside his house. Regarding the cognitive games he replies: *"I'm very occupied to do that"*. He likes all the devices with sensors, but *"I never use it"*, he mentions, probably because he does not understand exactly how they work. About the smoke detector he says: *"I do not usually cook. I heat it in the microwave"*. As Mr Marques does not have family, he does not have support for the use of the technology. Sometimes however he calls the team for support.

Changes resulting from the implementation

Mr Marques was hoping to improve his life and health thanks to the devices. Although he finds them useful, he does not use them, neither has he noticed many considerable changes in his life. He says he feels more secure *"because sometimes they call me to know how I am"*. He also likes the increased visits by the staff, which for him is the main change arising from the project and is positive *"because I am alone a lot of time"*.

The future after the end of the project

Mr Marques says that he would like to keep the devices because he likes the technology and he will miss the ones which control the movement. He further adds: *"If I had to pay, I would not participate, because I have more appliances and these are not necessary for me at all"*. A reasonable amount for all the services for him would be about 20 EUR/month as he already has a doctor and a nurse who visit him. He would be willing to advise his friends to use these services and he thinks that technology is the future. *"Look at the phone..., when I was young the phones did not exist and ...now we are all under control"*. Last he says: *"The devices could be more modern"*.

Observations

› Related to project planning:

- Need to differentiate between interest in technology and interest in the service offered.
- Participants' routines can play a role in how involved they are in the project.

› Related to the uptake of technologies and services:

- Familiarity and interest in technologies may facilitate acceptance but does not necessarily mean active use of the devices.

› Related to older persons:

- The contact with professionals can help

combat loneliness and feeling more secure when living alone.

› **Related to real life conditions:**

- Willingness to keep the devices does not equal willingness to pay.
- This case shows that there has to be a need and a genuine added value in order to be willing to pay for the service.

Case Study 4:

Ms Sheena O'Neill (Louth)

Ms O'Neill is 85 years old, widowed and living alone in a terraced two storey house in a small housing estate in an urban area with some shops and a green area in front of her home. She had a chairlift installed recently. She completed primary education and worked until 72 years in a local Sanatorium hospital and factory in a profession without technology and computer experience.

She was not very interested in using technical devices before the project started. She has a mobile phone but only accepts calls and cannot text on it. Nonetheless, she is not too bothered with technology.

Ms O'Neill is frail and has ongoing health issues. She suffers from diabetes, IBS, mobility issues and hysterectomy and had operations during the year to remove some of bowel. At the moment, she is *"Not as fit as I used to be,"* she says, *"Because it's only two months since the operation."* This still causes pain. Moreover, she was away for a weekend recently and had to pull own bags which caused injury to her legs. She is waiting until she is really fit before going back to the social clubs. Otherwise her condition is stable. She feels *"Not as healthy as I was, of course it's my age"*, she says, and takes *"40 sips"* drinks and feels they are providing energy.

Ms O'Neill was previously involved in another research project and enjoyed taking part in it. She was encouraged by a staff member to take part again and said

"Yeah I'll go." She never refuses anything now, was on national television with her participation in the previous project and had also gone to one or two computer classes in the college. All her family and friends are aware of her participation in the project. They were curious as to how she became involved in it: *"How'd you get into that?"* They just asked, but did not encourage her.

Using the devices

All devices have been installed as planned except for the Ello device and the glucometer. The Ello device was not deployed, as the router was not adjacent to TV and therefore impossible to use without internet connection. Ms O'Neill was *"mad"*, *"very angry"* and *"waiting for months & months for it"*, but this was said in jest. The glucometer was deployed but returned by the participant shortly after as it was not giving the same readings as her own glucometer and causing anxiety and confusion when used.

When she got the InTouch, first she was using it every day, but later every second or third day. She did not use the device when she was sick. She likes using the device and had no difficulty doing so, after it had been demonstrated to her. As for the Blood Pressure meter (BPM), it is the same as above. Ms O'Neill knows her blood pressure is alright because the reading is usually the same. *"If it's the same each time I know it's alright. (...) Leaves me that I know it's not gone skyhigh!"* She has no difficulties using it, except when the batteries run out. When Ms O'Neill uses the BPM she uses the scales as well. She finds them easy to use, as she only stands on. Ms O'Neill never had to use the Mambo, but it is always plugged in. She knows how to use it though and uses to test it by pushing the button. She does not really like it; she is afraid some of the grandkids could come in and push the button, *"putting out an SOS!"*

As for the devices not actively used by participants (environmental sensors) they did not cause any difficulties. Ms O'Neill thinks it is handy to have the smoke detector in the home. It never went off: *"Thank God I never had to call anybody."* As for the water detector, she did not realise that if water triggers it, it causes an alert. Similarly, she did not know what the motion detector was for. Once, an alert was triggered by the temperature sensor at 3.40 am during the winter when Ms O'Neill was not in the home, and a neighbour and her son were called because of the alert. Ms O'Neill liked the fact that it worked, but not the fact that someone was called so early in the morning.

Changes resulting from the implementation

Initially, Ms O'Neill had no real expectations regarding the use of the new devices, but she was delighted to get *"these things in"*, healthwise. A positive outcome is that she worries about if her blood pressure is high or low, and now she knows that it stayed the same and was contented – the same with her weight. She did not have to be running to the doctor to have it taken all the time and thinks she has lost a bit of weight.

The implementation of the devices did not influence Ms O'Neill's daily routine and activities outside her house. She did not notice any changes in her relationships with friends, relatives, nurses or her GP. Her family was delighted that she was getting the equipment in, this gave them a bit of peace of mind.

The main changes that occurred for Ms O'Neill personally were mostly that she is happier now with her life and the way things are now as she doesn't worry as much. She feels good because she knew that her blood pressure was up, but now when she can take it herself and it is normal it makes her *"come down the stairs in good humour."*



The future after the end of the project

When the project ends, Ms O'Neill will miss the project *"terrible"* as she has had the equipment so long now. She will miss that it keeps her up to date for the medical measurements and would like to keep all the devices except for the Mambo because of the grandkids.

In case Ms O'Neill was asked to pay for participating in the project, it depends on how much it would be. She lives alone, only has the pension and no other income at all, and has to pay all the bills. She would be willing to pay € 10 a month for it, but would have to give up something to continue keeping the service.

She would recommend her friends to use these devices if they wanted it and thinks that it is a great thing to have the devices and services.

Observations

› Related to project planning:

- The case of Ms O'Neill shows that previous experience is advantageous when recruiting participants.
- Ms O'Neill will miss a lot the devices after the project ends. Therefore, exit strategies should be an integral part of project planning.

› Related to the uptake of technologies and services:

- Ms O'Neill is not very interested in technology but likes to use the devices as she experiences the benefits provided.

› Related to older persons:

- Health care technologies have raised Ms

O'Neill's awareness about her health and contributed to her quality of life.

- Frustration may be caused when devices do not work or do not meet the older persons' expectations.

› **Related to real life conditions:**

- The willingness to pay for devices depends very much on the potential users' financial resources.

Case Study 5:

Ms Wendy Callahan (Louth)

Ms Callahan is a 79 years old widowed lady, living on her own in a semi-detached two storey house (no lift) in a small settled housing estate with front and back gardens in an urban area. During her professional life she had worked as a machinist in a factory. She has no technology or computer experience and was not very interested in using technical devices before the project started. She had devices like video recorders but *"I just carry a mobile," she says, "I don't go on Facebook or anything"*.

Ms Callahan had a heart attack a few years ago and now takes tablets for angina. She is suffering from blood pressure going up and down and was in the clinic for this reason. As blood pressure fluctuates frequently, she has regular check-ups (at least weekly). Otherwise her condition is stable. At the moment, she has to see the doctor weekly or *"... it could be twice a week, it depends on the reading"*. This means that she cannot really plan ahead (i.e. trips away). *"Would be a bit apprehensive about it, when you're getting [the bloods] done.... In case it's up or down."* Ms Callahan is waiting to see a cardiologist soon and is a little concerned about that. She has been dealing with her bloods for some time now and is not just completely content with her health; but at present she is not worried.

She spoke to her children and friends about participating in the project and they too

thought it was a good idea. Her children had *"no complaints"* about installing the technology and were happy about it. All family and friends are aware of her participation in the project.

Using the devices

Originally, all devices were planned to be installed. However it turned out that the Ello was not deployed. The router was not adjacent to TV and it was impossible to use Ello without internet connection. Moreover, there was not enough room in Ms Callahan's home for all devices to be installed. One week after installation Ms Callahan started to actively use the equipment. Initially, she was a bit anxious about the devices and she asked her daughters for help with using the equipment until she got used to it.

Ms Callahan likes using the InTouch and had no difficulty doing so after it had been demonstrated to her. When it doesn't work she gets in touch with the Netwell Centre (HSH partner in Louth). One problem she mentioned is that *"the mains going into the machine are very fragile and very easy to knock out ... the ones going into the back of the monitor"*. Besides, Ms Callahan doesn't use the games on the InTouch device because she has no interest in them. *"If it was only a short period you'd trick around with them to get used to it"*, she argues, but she has not the time to do it. The BPM is used once or twice a week, so are the scales. She handles these devices on her own and likes using them. The devices work well and the few times there has been a problem with them (normally just battery replacement) she gets in touch with Netwell. When the BPM wasn't working properly *"... it was no bother at all"* because the nurse would take her blood pressure regularly anyway. As for the Mambo, Ms Callahan never had cause to use it, but the device is always plugged in. She always carries it with her when she is in the house and it is handy enough to

carry it around: *"You can carry it outside to the [washing] line"*. She feels safer having it with her - in particular because she lives alone - and takes it up to the bedroom with her every night in case she needs it. *"It is reassuring to have it with you at all times"*. Once a month she tests it around though.

In the beginning Ms Callahan referred to the manual (provided by the Netwell Center) to figure out how to use the Mambo and found it difficult to understand, but got used to it and now is fine: *"Practice makes perfect."* Devices not actively used by participants (environmental sensors) didn't cause any difficulties. *"Sure you wouldn't even know they were there"*, she stated, referring to all of them.

Coming from the fact that she received frequent demonstrations of devices from Netwell Center (either on visits or as requested) throughout the project, Ms Callahan recommends this service as part of the package. *"Get a re-run of the devices occasionally"*.

Changes resulting from the implementation

The implementation of the devices did not bring about great changes in her apartment or daily routine and she did not notice any significant changes in her relationships with nurses, her GP or friends. In fact, changes in relationships with relatives occurred only temporarily. In the beginning Ms Callahan's daughter was around more, helping out with working the equipment, although she said it was *"more trouble than it was worth"*, but this was said *"in jest"*.

What changed most in the course of the project were Ms Callahan's feelings. In the beginning she was anxious about the equipment and about using it. But with practice and demonstrations she got used to it and now feels more confident although

"it took a while in the beginning to get used to it". It needed *"trial and error: Just fiddle around with it and find the right way to work [the devices]"*. She was surprised how simple it is to handle the devices once she got used to them. Devices are very *"safe"*, she says. She feels more content being able to monitor the blood pressure and weight and *"it's great to have the Mambo"*.

The effects these changes have on her usual way of living are manifold. Generally, she feels safer now with the devices. This relates to feeling safer in the house with the sensors, feeling safer at night with the Mambo and health-wise having the health monitors to keep an eye on her blood pressure and weight. These changes do not influence Ms Callahan's activities outside her house, though. Likewise, she does not experience much change to her social relationships and services except for the nice chats with the people who call and visit to collect data and demonstrate the devices. Otherwise, she has to do so many trips to the doctor (to monitor her bloods) that *"it would be the same if I had or hadn't got [the devices]"*.

Regarding her family, Ms Callahan is not sure whether they think the same about the equipment today or whether there are any changes in their opinions: *"They never say anything now"*. She uses the devices on her own and needs less help from the family. In the beginning she had asked her daughters for help with using the equipment and they thought that it was a hassle.

The future after the end of the project

When asked whether she would like to keep and use the devices, she *"doesn't mind one way or another but would like to keep the Mambo"*.

Regarding the rest of the equipment, Ms

Callahan would not really mind because she has to see the doctor fairly often and gets blood pressure and weight taken there about once a week anyway. She can do without the healthcare technologies and "wouldn't miss that end of it" when the project ends. She would miss the visits and calls though.

In case she would be asked to pay for the devices, Ms Callahan does not think she would be able to afford it because she has to pay for a lot of prescription tablets and has to get her bloods done regularly; on top of this she lives alone and has to pay all bills herself. Nonetheless she would be willing to pay € 10 - € 30 a month for all the equipment and would definitely recommend it to her friends, "especially for people alone."

And finally, regarding the effects the implementation of technology can have in general on older persons' future way of life, she thought it was useful for older adults "It's brilliant for people who are house-bound, for social and health as well."

Observations

› Related to project planning:

- People who are not technology experienced or interested need extensive training and support until they are able to use the devices on their own.

› Related to the uptake of technologies and services:

- Implementing technologies has to be accompanied by social services, training, and long-term technical support.

› Related to older persons:

- When Ms Callahan got used to work the devices and could handle them on her own, she liked to use them.

- Health care technologies are particularly useful for people living alone.

- They may be not so important for persons who need regularly direct contact with a GP or nurse anyhow.

› Related to real life conditions:

- An important aspect of this kind of pilots is the social component. When the project ends, Ms Callahan will not miss the technologies. Instead, she will miss the chats with the people who call and visit to collect data and demonstrate the devices.

Case Study 6:

Mr David Ahearn (Louth)

Mr Ahearn is 80 years old, widowed and living on his own in a terraced two storey house (no lift) in a small settled housing estate with front and back gardens in an urban area. He completed primary education and worked as a delivery/sales person, uploading sales using electronic devices linked to the factory computer system. Hence, he has technology and computer experience.

Mr Ahearn has no major health problems. He is being treated for gout and is taking tablets (and made some changes to his diet because of it), but his health condition does not mean any restriction for him and he is managing well. Mr Ahearn leads a very active life and goes to many social groups. "I can see myself, if I wasn't able to go out, I'd be the kind of person who'd get lonely. I enjoy company and I love people. But the Men's Shed is great; we're playing cards and pool."

Mr Ahearn had no previous interest in technology. However, he was previously involved in another project. He agreed as he was interested in the health monitoring aspect of it. "Was just curious... wanted to see what it was all about... I thought I might as well have a go at it".

Moreover, his partner was very interested in it and "was very glad to see [him] getting involved in it... and my children encourage me too". His children were very supportive of the project. They thought that the devices

would be good in his home and also that it would lead their father to have more of an interest in computers and to do a computer course. Now, Mr Ahearn is thinking about doing a computer course that is starting soon. *"They're all into computers and they were encouraging me to learn."* He says that he has a mobile but some of the other men in the Men's Sheds group have smart phones and *"they can get all this information on it and I regret not being more knowledgeable about [technology]"*.

Using the devices

He uses the InTouch two or three times a week but doesn't use the games. He has no interest in them and does not know how to play some of them. He is not interested in *"computer games"*, instead prefers social groups to meet up with others. *"I probably wouldn't have time for them; I'm always off down the road."* Mr Ahearn mostly uses the healthcare devices (BPM and weighing scales). The BPM is used two or three times a week. He is more conscious of health since taking part in the project and so does his blood pressure regularly. He was contacted a few times to say that his blood pressure was a bit high and he went to the doctor to get it checked out after that just to be sure. *"It did make me more conscious of my health"*. It is the same with the scales. He is more conscious of putting on weight and is trying to lose a bit of weight to feel better about health. The Mambo is always plugged in although Mr Ahearn never really uses it. *"Keep it on standby and I take it up every night beside my bed in case I need it."* Friends have a panic button and one lady fell and she had it on her and used it to get help. Now Mr Ahearn takes his device with him everywhere in the house too. He never had cause to use it, but tests it once a month. When Mr Ahearn has a problem with any of the devices his grandson comes and helps him out.

As for devices not actively used by participants (environmental sensors) they did not cause any difficulties, worked well and he likes having them. *"Smoke detectors are great"*, Mr Ahearn says. He likes having it because *"it is reassuring to know there's somebody there"* – just as the water detector is *"reassuring to know it's there"*. The temperature sensor went off once because it was very cold in the house. Mr Ahearn was contacted to see if everything was ok in the house. All was ok, but he liked that there was someone to check that everything was ok. He did not like it so much, though, that he was rung so late because he was worried it was someone calling with bad news.

Changes resulting from the implementation

Initially, Mr Ahearn had no real expectations regarding the use of the new devices. In the course of the project, he was amazed at how much the devices can do. *"I didn't think it was so advanced,"* he said and found it amazing to see that these devices could measure one's blood pressure and weight and send it to someone to monitor. He found it very reassuring to know that someone could remotely keep an eye on his health. He finds the devices very useful because using the BPM and the scales made him more conscious of his health and he now takes better care of himself. He altered his diet and is also trying to lose a little weight. *"My children think I'm a wee bit of a health-freak now (...) I would even eat fish about 3 or 4 times a week now"*. He feels good about the changes because using the devices *"drew attention to the fact that I was letting myself get a little bit overweight."* Mentally he also feels better in himself now.

The implementation of the devices did not bring about great changes in Mr Ahearn's home and he did not notice any changes

in his relationships with nurses or his GP. He *"just worked it in [to his daily routine]"*.

Concerning his relationships with relatives Mr Ahearn does not report any changes except that his children are now trying to encourage the use of computers. His family were in favour of getting the devices at the start and are very supportive of it still since they see that it is helping him to maintain a healthy weight and look after his health closely: *"It reassures them that I am being conscious of my health now yeah."*

As for his friends he says as well that there were no changes. They are also encouraging the use of technology and keep telling him to get a computer now that he has experience with technology from using the devices. The implementation of the equipment did not influence his activities outside his house as he is very socially active and involved in many social groups: *"It didn't really make a big impact on my life, or what I was doing, because as you can see I'm very active anyway."*

The future after the end of the project

Mr Ahearn is not really sure yet whether there is anything of the equipment he is going to miss. His attitude is a bit ambivalent. On the one hand he says that he will have to wait and see when the project ends. On the other hand he would like to keep all the devices because he finds them very useful and reassuring for health and also safety/security reasons. Socially he doesn't think he will miss much because he is heavily involved in many social groups which take up a lot of his time.

He also thinks that as he did not have any reason to think about monitoring his health he would not have needed the devices badly enough to have wanted to pay for them. *"I don't think I would because at the*

time everything was going well with me." He said that he would not be able to even guess at the price because he doesn't have many other technological devices and he would not know how much they would cost to buy. At the same time, Mr Ahearn not only would recommend using the devices, but he did recommend the devices to a few of his friends, one of whom has actually ended up taking part in the project and now also uses the devices.

And finally, with regards to the kind of effects the implementation of technology can have in general on older persons' future way of life, Mr Ahearn thinks it was very useful for helping older adults monitor their own health and well-being and also good to have the devices for safety and security. *"It's very reassuring and it's great to know it's there."*

Observations

› Related to project planning:

- Implementing technologies has to be accompanied by continuous technical support.

› Related to the uptake of technologies and services:

- Also people who are not very interested in technology like to use the devices once they experience the benefits provided.

› Related to older persons:

- The case of Mr Ahearn shows that health care technologies can raise the consciousness about one's health and contribute to better self-efficiency and feelings.

› Related to real life conditions:

- Implementing technologies has to be accompanied by continuous technical support.
- The willingness to pay for devices depends on the urgency of problems and main benefits drawn from the devices.



Case Study 7:

Ms Joke Aerts (Antwerp)

Ms Aerts is a widow, aged 91, who lives alone in a service flat on the ground floor in a quiet suburban area. She has a higher education, has no experience with a computer but she uses a mobile phone. She is not particularly interested in technology, but has not avoided it either. She has had a gastrointestinal bleeding four years ago, but she now follows a special diet and as long as she sticks to that she does not have health problems. She signed up for the project out of interest and to help people that way *"because if nobody would do it there would not be any results"*. Her family did not have an opinion about it and left it up to her to decide.

Using the devices

About her use of the different devices she reports not using the Blood pressure meter (BPM), as the doctor uses his own. She however uses the weighting scales once a week and likes them because they help her to follow what her weight is. It works alright, except that the batteries are low very fast: *"The only minor issue is that the batteries go flat quite quickly"*. Regarding Ello, she uses it once a year when the children are on holiday. She is *"sort of satisfied about it, but it didn't always seem to work. Last time when I used it on my own with my children, they could hear me, but I couldn't hear them."* She has tested this with the staff and then it worked well, but it does not work with the children. She hardly ever uses the

cognitive games and has not needed the Mambo yet, but it is on her bedside table. She is happy to have it because it enables her to call someone. She uses the InTouch to monitor her weight, but she does not like it because it is *"a bit too big for my taste and I actually find it getting on my way"*. It has been out of order for a few weeks without apparent reason. She has no opinion about the smoke detector, temperature/humidity sensor and water leak detector.

Changes resulting from the implementation

She has not noticed that anything changed in her life because of the experimental equipment. She had no expectations about the devices and therefore she cannot report that her expectations were fulfilled. She has never gone much outside and she still does not do so. She has enough to do at home like reading, or listening to music. She does not feel the need for company.

The future after the end of the project

She would not like to keep the new equipment after the project is over, because *"most of the same facilities are provided by the service flat"*. She dislikes the much wiring in her apartment, which bother her cleaning lady and emphasizes that the InTouch is an awkward apparatus. She would not be willing to pay for them either, because she has most of the things double and has no idea about the price. She has talked with friends about the facilities, but many do not want to start with them. She suggests for future improvement that the television should be connected with Skype. Her final comment: *"It is good for older people, if they live alone and not in a service flat, connected with a service centre. Especially for security at night, because that way there is a check on them"*.

Observations

› Related to project planning:

- Interest to help others is an important motivating factor for some participants in a trial.

› Related to the uptake of technologies and services:

- Devices that are not actively used by users are not easily understood/evaluated, unless there is an emergency.
- Devices must be easy to use.
- Devices should be relevant for a need experienced by the older person.
- Devices should not be an obstacle in the home of the older person.

› Related to older persons:

- Ms Aerts has not experienced any important life change thanks/due to the technology.
- Ms Aerts thinks that the Home Sweet Home services would be good for people who live alone outside a sheltered housing.

› Related to real life conditions:

- When the service offered is duplicating an existing service, added value is minimal and therefore participants may be less likely to want to adopt it.
- Ms Aerts has participated in order to allow the experiment to succeed. In real life, this will no longer be a reason to try and work with ICT. There may be a greater resistance to the uptake of technological devices.

Case Study 8:

Mr Willy Bakker (Antwerp)

Mr Willy Bakker, aged 73, is a widower, living alone in a sheltered housing complex, in an urban area with many students. He has alarms at his bedside. He has had primary education and three years of professional training. In his job he has worked with computers and he has seen their evolution. He has a PC, a mobile phone, uses

Facebook, and has an interactive TV. He bought a tablet but gave it to his godchild.

He has had a heart condition and has got 7 bypasses in 2005 but has had no more problems since that time. He hopes his condition will remain the same, but he mentions that he has some mobility problems. He has arthritis in his knee and uses a walker. For long distances his son picks him up.

The moment he heard about the project he was interested. He even tried to convince others to participate. He has always been interested in technology and more generally in anything new. He has been encouraged by his son. His GP also showed an active interest and said he wanted to follow the results, but his nurse had some reservations, because a Blood Pressure Meter (BPM) can show varying values (for instance after a walk) but the BPM cannot interpret such data.

Using the devices

He uses the scales every day, is happy with them because they help him control his weight: *"I use it every day and am very happy about it. It's not difficult to use so I can do it on my own and show the results to the GP"*. He has not had any problems with them except that he would have liked to get a signal when the batteries were low. He uses the BPM every day as well, because it gives him control. His results were the same as those of his GP. Towards the end the BPM acted funny and was replaced. Ello was used only for testing, but it was not possible to add new contact persons. He would have liked to have a manual. He also regretted that *"it wasn't very clear if someone was available for a chat"*. He liked the cognitive games and used them once a week. He also used the Mambo which gave him a sense of security. He used the InTouch every day and he finds it interesting to look

up information. His GP would have liked to receive the blood pressure data and also the humidity figures. He had no problems with the Mambo. When things did not work properly he thought it was a pity, but it is an experiment. Nonetheless he wished the batteries of the Mambo would last longer and he would have liked more choices with the cognitive games, like crossword puzzles or card games.

The smoke detector was better than the one provided by his apartment. He liked the information given by the temperature and humidity sensors. The motion detector gave him a sense of security but it is not possible to see whether it is active or not. Once he went away for several days and it did not give a signal. The water detector once gave a signal when the cleaning lady was there.

Changes resulting from the implementation

The devices have brought about some changes in the life of Mr Bakker. He mentions he feels more secure and the follow-up by the occupational therapist is nice. The GP would have liked to be involved, whereas the nurse was a bit sceptical about the BPM. Taking the measurements has brought some more regularity in his daily life. It also made him reflect more on what he was doing. He has had increased social contacts with other users.

The project has strengthened his conviction that these devices are useful and that this is the future: they provide comfort, security and they are a necessity. The project has also been of influence in his contacts with others. He has stimulated friends and relations to go and look for similar devices. His oldest sister has even tried to find an alternative for the Mambo. His relatives are more relaxed because they know that he is being monitored. Mr Bakker feels he has become more active and thinks the changes that have occurred are for the better.

The future after the end of the project

Mr Bakker would like to keep most of the devices, with the exception of the humidity sensor and the water leak detector. He thinks it would be handy to have a remote control for the temperature sensor.

In principle he would be willing to pay for them, but it depends on how much he would be charged. Regarding willingness to pay, with his pension he can just pay for his apartment. He thinks the maximum should be €50/month for everything except the humidity sensor and the water leak detector.

Mr Bakker suggested that for persons with a hearing impairment it would be handy to have a text with Ello and the Mambo in order to give them confirmation, so would be a video camera in the Mambo and a medication reminder.

He thinks the project makes sense, especially for people who are not so well, and that the implementation of the technology will have an influence on the lives of older persons, for instance to control their health and their nutrition.

Observations

› Related to project planning:

- Mr Bakker has been in touch with other participants. It may be a good idea in future projects to bring users into contact with each other. They can help and motivate each other; besides this stimulates social interaction.
- When planning to implement devices, it is important to involve the health care professionals who are already treating the older person, as they are likely to do their own monitoring.

› Related to the uptake of technologies and services:

- Mr Bakker is the ideal user of ICT projects.

He has experience in technology, likes it and is not startled when things do not work as they should, as he feels that this is normal in an experiment. - Mr Bakker would also like to be able to see whether devices are in operation or not.

› **Related to older persons:**

- Mr Bakker feels he has more control over his health and he feels more secure. He has become more aware of how he is doing certain things. He has also become more active.
- The fact that even someone as experienced and positive as Mr Bakker has some problems with the use of the devices, shows that we have to ensure that the equipment must be better tested and more reliable before it is given to older persons.

› **Related to real life conditions:**

- The costs may be an impediment for many older people.
- Users can be a social and sometimes also technical support to each other.

Case Study 9:

Ms Maartje Coenen (Antwerp)

Ms Coenen is a widow, aged 87, who lives alone in a sheltered apartment on the fourth floor. There is a lift in the building which is located in an urban area with busy streets. She has completed secondary education and has had a career as an opera singer. She has no experience with technical devices and only uses a mobile phone.

Her blood pressure is sometimes too high and sometimes too low and she has a pacemaker. Walking is not easy for her, much to her regret, so she is unable to do her own shopping. She has someone to do it for her. She is supposed not to lift heavy things. She also has some osteoarthritis. She is more easily agitated than she used to be. She keeps mentally active because she is afraid of getting dementia. She acts as a

volunteer in the chapel, although this is not easy for her, and she has seen how people, after a fall or an attack return and have lost a great deal of their mental capacity.

She has always been interested in new things so she wanted to participate in the project but she would have preferred to be in the control group, so she would not get the devices, but it turned out differently. She acknowledges the usefulness of technology but as her late husband, an analyst, used to say about technology: *"be careful before you start to use it, because you will get hooked"*. She does not really like technical devices and prefers reading. Her husband also used to say: *"The more complicated the system, the more the problems."* Technology is nice for some people in some circumstances but it is less personal. People have a need for human contact, but if you call an institution you get a recorded message. Ms Coenen explains that while some technical devices can facilitate everyday tasks, they may not solve every problem, if for example older persons have to go to the bank anyway to pay for the service offered. Designers tend to overlook older people's real everyday living. She does not have any close relatives so she has not discussed her participation in the project with any family members.

Using the devices

The water leak detector was not installed, as it could not be placed in a safe manner. The InTouch was placed in Ms Coenen's broom closet because it was nearer to the internet connection and avoided being too visible, which the participant did not like.

She does not use the blood pressure meter because she uses one of her own. She also does not understand why she had to confirm the measurements, because her GP comes every month to see her. It could, however, be interesting for others. She has used the scales regularly but she

finds it stupid she has to confirm every time. She has not used Ello, arguing that *"I don't see the need for it. I use my telephone or my mobile phone if I was to contact somebody and if I want to see someone I go downstairs or go outside"*. The InTouch device went offline all the time, because there were connectivity problems. She tried the cognitive games but found them dull. She does not use the Mambo, because the service of the apartment is better. *"You push a button and they are there in 5 minutes. With the mambo they first ask: What is the matter...?"* she explains. When she goes outside she takes her mobile phone which is much smaller than the Mambo.

She could not tell when the motion detector did not work but then 2 or 3 persons came to see what the problem was. The motion sensors regularly went out of service, maybe because they were too sensitive. She has never had any alarm from the smoke detector.

Changes resulting from the implementation

Ms Coenen did not have any expectations before the start of the project. She feels she does not really need the devices. She thought it might be more interesting when she is older and would really need them. But that is not now yet. Once the devices had been installed, she was bothered by the InTouch as it stood in her way. There were no changes in any of her relationships but she mentioned that her GP was, like her, of the opinion that the nursing sector was being dehumanised. She continues to communicate with friends and relations by telephone.

The future after the end of the project

In the course of the project her feelings about the devices have changed. In the

beginning she had an open attitude, but at the end of the day she found she does not need them and she begins to thoroughly detest them. Therefore she does not want to keep the devices: *"for God's sake no"*, she says. *"It's like those little gifts that you receive from somebody and that you can't throw away but that you find terribly ugly"*.

She would only be willing to pay for the devices if she would really need them. She mentions what she has to pay for her help with the groceries, the cleaning lady and the rent of the apartment, and seems to imply that there is not much room for more expenditure.

Her suggestions for improvements relate to the batteries. Users do not get a warning when the batteries are flat. The cognitive games are not very relevant for her and she did not find them interesting. She suggested making them tailor-made. The InTouch is the least interesting of all devices and rather useless. She does not really need the devices, but she can imagine that she would find them useful if she would be living alone in a house. The project is a praiseworthy and practical initiative and not only for people who live alone and have a bad condition. And, of course, the devices must work.

Regarding the effect of the implementation of technology on the lives of older people she thinks that it will become more impersonal, the human warmth will be lacking. Even if it is only 5 minutes that people can have a chat, it is very relieving, as she notices in the Mass on Sundays that this is a relief for people. Moreover she wonders: *"And what about the costs? The devices aren't really cheap and they are fast outdated so they need to be replaced again."*

Observations

› Related to project planning:

- Ms Coenen had hoped to be in the control group and therefore would not have to use the equipment. It was just for the sake of the experiment (altruism) and to satisfy her own curiosity that she participated.

› Related to the uptake of technologies and services:

- Make sure the devices relate to a need experienced by the older person.
- Ms Coenen does not understand why she has to confirm her measurements. Users should not only be explained what they have to do but also why.
- Games should be tailor made: adapted to the interests and capabilities of the user.
- Ms Coenen would have liked to be able to see if devices are in operation or not.
- Make sure devices are not an obstacle in the home of the user.

› Related to older persons:

- Ms Coenen fears the loss of human contacts because of ICT.

› Related to real life conditions:

- Ms Coenen believes that the costs of technologies might be a problem as well that they are outdated fairly soon.
- She does not like the devices, but nonetheless she recognises that they could be useful, but under other circumstances: if she was older, lived alone and needed them more.

6. Acknowledgements and more information

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The Home Sweet Home consortium is comprised by the following organisations:

Zorgbedrijf Antwerpen, Belgium

Digipolis, Belgium

Mutas, Belgium

Ziekenhuis Netwerk Antwerpen, Belgium

Christelijk Algemeen Ziekenhuis Midden

Limburg, Belgium

AGE Platform Europe, Belgium

HIM SA, Belgium

Badalona Serveis Assistencials, Spain

TicSalut, Spain

Christelijke Mutualiteit van het arrondissement Antwerpen, Belgium

De VoorZorg Thuiszorg Antwerpen, Belgium

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About the Home Sweet Home project

The Home Sweet Home project (Health Monitoring and Social Integration Environment for Supporting Wide Extension of independent life at Home) tested a comprehensive set of home assistance services aiming to extend the independent living of older people. The project, which started in March 2010 and ended in February 2014, was funded by the European Commission under the Information and Communication Technologies Policy Support Programme (ICT-PSP). The project consortium comprises public and private organisations from 4 EU countries.

More information:

www.homesweethome-project.be

About AGE Platform Europe

AGE Platform Europe (AGE) is a European network of around 165 organisations of and for people aged 50+ which represents over 30 million older people in the continent. AGE aims to voice and promote the interests of the 150 million senior citizens in the European Union and to raise awareness on the issues that concern them most.

In the Home Sweet Home project AGE was in charge of the management of the Advisory Board and produced this publication on the results of the qualitative study undertaken during the project.

More information:

www.age-platform.eu



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