Research, testing and experiences of the I-stay@home approach
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The I-stay@home partners wish to thank all the product providers who agreed to work with us in this project and let us display their products.

Imprint

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# INDEPENDENT LIVING THROUGH TECHNOLOGY

1. **Introduction**

2. **Current Difficulties Faced by Tenants**

3. **Current Support Structure for Tenants**
   - 3.1 Family and Friends
   - 3.2 Social Care
   - 3.3 Technology

4. **Introducing Assistive Technology**
   - 4.1 Tenants who would not Consider Assistive Technology
   - 4.2 Tenants who would Consider Assistive Technology

5. **Future Areas of Concern for Tenants**
   - 5.1 Tenants greatest Concern
   - 5.2 Specific Areas of Concern

6. **Future Support Structure for Tenants**
   - 6.1 Family and Friends
   - 6.2 Social Care
   - 6.3 Technology

7. **Barriers to Adopting Technology**

8. **Conclusion**

Appendix: Demographics of Tenants
THE TESTING PHASE

1 Introduction 24

2 Products to be live tested 25

WITHINGS Smart Body Analyzer WS-50 25
VIVAGO Watch - Emergency calls 26
SOPHITAL® 27
MiBida 28
iRobot® Roomba - Vacuum cleaning robot 29
WITHINGS Pulse (O2) - Activity Tracker 30
ComfiCare® 31
LightwaveRF 32
Ucam247 Outdoor Wifi IP Camera 33
Stove Guards  SAFERA SIRO R Stove Guard 34
INNOHOME Stove Guard Kit SGK500-3CC 35
WITHINGS - Wireless Blood Pressure Monitor 36
SALVEO - Fall alert 37
TabTime Med-E-Lert - Pill Dispenser 38
GEOCARE® 39
SYBILITY Voice Control - PILOT one 40
En: key - Heating control 41

3 I-stay@home Platform 42

3.1 Home Page 43
3.2 My Profile 43
3.3 My Demands 44
3.4 My Notices 44
3.5 My Contacts 45
3.6 My Sharings 45
3.7 My Services 46
3.8 Findings 47
LEARNING BY DOING

1 Introduction 48

2 Tenant Experiences 49
   2.1 Introduction 49
   2.2 ICT and Tenant Independence 49
   2.3 Tenants Learning ICT 53
   2.4 Tenant Favourites 55
   2.5 Conclusion 55

3 Housing Organisations’ Experiences 56
   3.1 Introduction 56
   3.2 Preparation for Testing 56
   3.3 Product Choice 57
   3.4 Installation 57
   3.5 Introducing the Technology 58
   3.6 Malfunctions 58
   3.7 Final Words 59

4 Extract from Scientific Evaluation of Pilot Sites 60
   4.1 Scientific Evaluation of Pilot Sites from Tenants’ Perspective 60
      Introduction 60
      Housing Organisation Services 61
      Possible Connection between Housing Organisation’s Service Package and
      Satisfaction of Tenants 64
      Conclusion 64
   4.2 Housing Organisation Influence on the Satisfaction of Tenants with I-stay@home-Technology 65
   4.3 Final Words 65

OVERALL CONCLUSIONS 66
EXECUTIVE SUMMARY

This publication gives an overview of the milestones of the I-stay@home project. It starts with the initial research that was carried out in the first phase of the project, followed by the selection of technology for live testing in tenants’ dwellings and ending with the experiences and lessons learned from the whole pilot phase. As part of the product testing, the project partnership also developed an ICT platform to integrate external products into one single interface to facilitate elderly and disabled peoples’ use of ICT products. This platform is introduced in the second part of the publication.

As the basis for the whole project, the first part of this publication gives an insight into the views of individuals living in the social rented housing sectors of Belgium, France, Germany, Holland and the United Kingdom on the use of information communication technology (ICT) solutions as tools for providing support in old age. The report also helps identify tenants’ key concerns now and for the future.

The results show that elderly and disabled tenants currently rely primarily upon family and friends for support with daily life activities. Supplementing this support are the social care system, usually through domestic carers, and some technology such as powered wheelchairs, emergency alarms and computers.

With regard to future support and how that will improve tenants’ quality of life, tenants envisaged family and friends to continue to play an integral role in their support. When asked about the types of technology that could help them, tenants were on the whole unable to think of any, illustrating a lack of awareness of the technological options and presenting an opportunity for the I-stay@home project.

Three fifths (61%) of tenants who do not currently use assistive technology expressed an openness to adopting new technologies while a quarter (27%) said they would not want such support (a further 13% did not know).

The main barriers to adopting assistive technology are affordability (74%), general awareness of products (52%), usability (50%) and reliability (40%).

Afterwards, suppliers of potentially useful products were invited to participate in the project by allowing their product to be evaluated by the I-stay@home scientific team to determine their suitability for our tenants. More than 100 suppliers participated in this process, providing extensive information about their products. These products were then evaluated with the help of experts in ICT technology, social workers and other people specialised in dealing with elderly and disabled people. The second phase also included the development of a platform, with the purpose of integrating the user interface of the individual ICT solutions to make them more easily accessible to tenants.

With a list of products to choose from, the nine participating housing organisations each selected a number of technologies to test with their tenants and began recruiting for the piloting phase of the project. Each organisation chose technologies on the basis of what would be most beneficial for their tenants.

The second part of the publication presents the ICT products that have been installed in tenants’ homes for live testing to measure their suitability, usefulness and acceptance amongst the tenant base. We present the reasons for which each product has been chosen, the areas of need each product addresses and the countries in which each product was tested. A description of the platform is also provided.

The last part of the publication presents the experiences of tenants during the testing process, the experiences of housing organisations as service providers for this testing phase, and an excerpt of the scientific evaluation report of tenant experience. Understanding these different perspectives permit conclusions to be drawn about the I-stay@home approach for application in future endeavours.
Basically, tenants were very satisfied with the I-stay@home-technology and for some of them it meant a real improvement in their lives. Most housing organisations found this work to be very encouraging, motivating them to work on a concept for the future which will include assistive technology for elderly or disabled people. Nevertheless, housing organisations also found that social support was still essential to aid participants in using technology and to make them feel more comfortable with it in their everyday lives. Housing organisations tried different approaches to support their participants during the testing phase such as consultation hours, telephone hotlines, regular individual training sessions or collaborating with external social service providers. All in all, each of these approaches was successful in terms of tenant satisfaction.

The scientific evaluation seems to indicate that the use of I-stay@home-technology can improve quality of life, particularly with socially isolated tenants with moderate income and education. Gender and immigrant status seem to be less significant factors. Furthermore, this research indicates that tenants fitting a particular demographic profile face only minor challenges in implementing ICT to significant benefit. There is therefore a large target group with significant market opportunities.

In terms of the influence of housing organisations, the results of the project seem to indicate that an extensive service package would be able to further increase the quality of life improvement already provided through I-stay@home-technology. However, tenant satisfaction does not depend solely on the way new technologies improve independence. Rather, services provided by housing organisations must play a supplementary role to other support.
ABOUT THE PROJECT

People across Europe are living longer now than ever before and the distinct needs and concerns of older and disabled people as members of society is an increasingly important topic for governments and service planners.

I-stay@home (ICT SoluTions for an Ageing societY) involves housing providers as well as technical partners from North West Europe and aims to identify, select and test a range of affordable ICT (information communications technology) solutions that can help older people to continue living independently in their homes.

The consortium partners are emphasizing aspects such as safety, health and comfort when evaluating products and services, in addition to energy consumption and communication.

The project partners believe that a being supported at home should be possible for all, irrespective of income or economic background. Affordability is therefore another important criteria for all devices, services and solutions that are chosen for testing.

I-stay@home runs from 2012 till 2015. During this time, the partners deliver together four phases of work:

1. Identify and consider the core concerns of older and disabled people in terms of their ongoing independence at home (2012).

2. Make a pre-selection of affordable ICT based products and services that are currently available (2013).

3. Live test the selected solutions in about 200 homes of tenants from the participating housing organizations (2014).

4. Publish details of the products and services via a database platform to make them better available for the elderly tenants and housing providers (2015).

THE PARTNERS

Lead Partner: Joseph-Stiftung, Bamberg, Germany

Aareon France SAS, Meudon la Forêt, France
De ideale Woning c.v., Antwerp-Berchem, Belgium
EBZ Business School, Bochum, Germany
Foundation Smart Homes, Eindhoven, The Netherlands
Habinteg Housing Association Ltd, London, United Kingdom
Le Foyer Rémois, Reims, France
Rheinwohnungsbau GmbH, Düsseldorf, Germany
Stichting Woningbeheer Betuwe, Lienden, The Netherlands
SOPHIA living network GmbH, Bamberg, Germany
Vilogia, Villeneuve d'Ascq, France
Volkshaard cvba, Ghent, Belgium
De Woonplaats, Enschede, The Netherlands

Subpartners of Aareon France:
Intent Technologies, Paris, France
Isen Ecole d’Ingenieurs, Lille, France

The project was born within the European Federation for Living (EFL)
This section of the publication gives an insight into the views of individuals living in the social rented housing sectors of Belgium, France, Germany, Holland and the United Kingdom on the use of information communication technology (ICT) solutions as tools for providing support in older age. The report also helps identify tenants’ key concerns now and for the future. In total 208 individuals participated in the survey.

Provided with a list of daily activities, tenants were asked to identify the ones that are currently challenges for them. The most frequently mentioned activities were online banking (52%), use of the internet (46%), being able to get around (45%), cleaning (38%), and being able to sleep (34%).

In order to discover their most significant concerns for the future, tenants were presented with a list of ten broad aspects of living. Tenants indicated that being able to get around, see, hear and communicate (53%); mental health and well-being (40%); being able to care for themselves and their home (34%); and health care and health monitoring (33%) were their greatest areas of concern. Specifically, tenants were particularly concerned with issues such as degenerative illnesses, lack of mobility, loneliness and depression.

The results show that elderly and disabled tenants currently rely primarily upon family and friends for support with daily life activities. Supplementing this support are the social care system, usually through domestic carers, and some technology such as powered wheelchairs, emergency alarms and computers.

With regard to future support and how that will improve tenants’ quality of life, they envisage family and friends to continue to play an integral role in their support. When asked about the types of technology that could help them, tenants were on the whole unable to think of any, illustrating a lack of awareness of the technological options and presenting an opportunity for the I-stay@home project.

Three fifths (61%) of tenants who do not currently use assistive technology expressed an openness to adopting new technologies while a quarter (27%) said they would not want such support (a further 13% did not know).

The main barriers to adopting assistive technology are affordability (74%), general awareness of products (52%), usability (50%) and reliability (40%).
Elderly and disabled tenants face a large number of challenges in their daily lives, which are broadly centred on aspects of living such as mental health and well-being, socialising, nutrition, domestic and personal activities, safety and security, health care and monitoring, general awareness, civic participation, and financial management. In order to identify the challenges tenants currently face, they were presented with a set of conditions under these themes. Their responses will help identify the types of assistive technologies that would best meet the current needs of tenants.

The results show that tenants have the most difficulties with online banking (52%) and in use of the internet (46%) indicating that tenants’ interaction with online material is an important challenge for them. Almost half of tenants also had difficulties getting around (45%), with lower levels having difficulties with cleaning (38%), sleeping (34%), and doing the shopping (28%).

Conversely, tenants are least likely to mention difficulties with activities such as taking medication (7%), communicating with others (7%), speaking (8%) and/or closing doors (8%). Unprompted tenants also mentioned a number of specific challenges they currently face which include degenerative illnesses, depression, isolation, feelings of insecurity and economic hardship.
In order to introduce ICT solutions-based assistive technology into the lives of tenants, the I-stay@home project had to first determine their current support structure. The project identified three broad categories of support that tenants could draw upon, those being family and friends, social care, and technology and it is the aim of the I-stay@home project to establish the balance between these three now and for the future.

3.1 FAMILY AND FRIENDS

Tenants were prompted with a showcard showing these three elements of support and asked to provide the types of support they currently received within each. Residents identified family and friends as the most relied upon source of support they currently receive. Family and friends would include mostly children and spouses.

The most commonly mentioned support tenants receive from friends and family was help with transportation. The majority of tenants were unable to transport themselves around their communities to take care of important tasks. Tenants needed help with transport to visit the doctor’s office, and/or town centres.

Additionally tenants received much support for household chores. Among these activities, the most frequently mentioned are help with shopping, cleaning, home maintenance, and bathing.

Lastly tenants also receive financial assistance from family and friends. Some of the sources of financial support that people drew from their family were help with banking activities, obtaining food vouchers and cash.

3.2 SOCIAL CARE

Tenants identified two broad areas of support from the social care systems: support that deals with domestic care challenges, such as shopping and cleaning; and care which deals with personal care challenges, such as bathing and toilet use. Whilst most of this care service is funded by social insurance (varying across partner states), some tenants indicated that they were often required to pay at least part of the costs for social care, an issue that caused financial distress for some.
Tenants also receive financial assistance from the social care systems.

Tenants receive assistance such as rent assistance, bill assistance, and other miscellaneous cash allowances. These allowances reflect the low income profile of social housing tenants across the study area.

3.3 TECHNOLOGY

Just as the social care system is part of a suite of support tenants receive; for the purpose of this project it is also important to establish the current role of assistive technology. When asked about current forms of technological support, tenants came up with a range of responses that fit into some broadly defined categories.

The most commonly mentioned category of technology was mobility aids. Tenants mentioned examples such as powered wheelchairs, stair lifts, and through-floor lifts, reflecting earlier results that simply being able to get around and to gain access to sites are primary concerns for tenants, and are ones that can be successfully dealt with through the application of assistive technology.

Tenants also identified environmental adaptations, technology installed in their home or other frequented localities to make the environment more accessible. These adaptations took many forms such as the inclusion of bathtub lifts, elevated toilets, grab rails, powered doors and powered windows.

Tenants also mentioned technological support that was centred on health monitoring, which is important for maintaining independence. The most mentioned examples were emergency alarms and blood pressure monitors. Computers also play a significant role in supporting elderly and disabled people in staying independent. The use of computers varied, but tended to focus on the general use of the internet in order to learn about new things and stay involved in local groups; sending and receiving e-mails; online banking; and playing games.
Tenants also mentioned a series of communication aids which they viewed as sources of technological support.

They include mobile phones, smart phones, and hearing aids. Mobile phones were frequently carried by elderly people as a “favour” to their family and friends, so that they can get in touch with them when necessary, and their use rarely seemed to go beyond that. Individuals using smart phones, however, seemed to engage more with the possibilities of those technologies, and frequently got a significant amount of use from their devices, using them for games and financial management. Hearing aids were a more basic technology, simply allowing individuals to hear.

“I use my computer for online banking and the internet, but it’s so, so slow...”
– British resident

“I would like to be able to look at things on the computer...”
– Belgian resident

“I’m part of a computer club, where we teach people to use computers for emailing and browsing the internet.”
– British resident

Tag cloud 3: Support Received from Technology

Wall Handles
Powered Windows  Smart Phone
Blood Pressure Monitor

Hearing Aid
Powered Wheelchair

Mobile Phone  Stairlift

Emergency Alarm
Health Monitoring  Powered Doors

Computer  Elevator

Internet  Elevated Toilet
Email, Online Banking

Bathtub Lift
Games
4 INTRODUCING ASSISTIVE TECHNOLOGY

The purpose of this section was to determine whether participants would be willing to introduce technology in their homes, where they had not spontaneously mentioned assistive technology as a means of support. Of these tenants, three fifths (61%) would consider a technological solution for a problem; whilst around a quarter (27%) indicated that they would not.

4.1 TENANTS WHO WOULD NOT CONSIDER ASSISTIVE TECHNOLOGY

A number of tenants indicated that they would not consider the use of technology to solve their problems. By far, the most commonly mentioned reason for this was that individual tenants had no problems currently and therefore did not need or want assistive technology. Tenants also said they would not consider assistive technology because they are unfamiliar with the technology, they did not like it and/or assistive technology was not worth it.

Some tenants did not want to use assistive technology because they did not want to become dependent upon it, an interesting response and point for consideration for this project. Paradoxically for the I-stay@home project, technology is meant to help tenants lead independent lives however for these tenants dependency on assistive technology can itself become a threat to independence, which presents an interesting dichotomy for the project.

4.2 TENANTS WHO WOULD CONSIDER ASSISTIVE TECHNOLOGY

Where tenants indicated that they would consider an assistive technological solution in their home but currently do not, the most commonly mentioned barrier was affordability. Tenants do not use technology because of a perceived (rightly or wrongly) financial barrier to acquiring such technologies. When probed further, tenants unsurprisingly revealed that they often lived on very limited incomes, and simply could not afford to invest in additional technologies.

"I want to take a course on the internet, my son uses online banking and I'm interested."  
– Belgian resident

"I would accept technological aid, but I am concerned it would cost too much and be too hard to learn."  
– British resident
It is the view of tenants that they would indeed use whatever technology that was available as long as it was easy to use. Tenants were concerned that they would not be able to operate some technological solutions, either because of their own ignorance, or due to a piece of technology not being adapted to accommodate their needs.

Notwithstanding the usability and affordability of technological solutions, tenants would indeed adopt technological solutions if it were demonstrated that they solve specific problems. Assistive technology would have to clearly demonstrate that it solves specific issues around security, mobility, finance, better health, cleaning, communication, and emergencies.

“Because I am often alone and my daughter has her own life, I need help from the technology, like the emergency call.”

— German resident

“I would consider any technological solution, as long as it is needed and doesn’t cost too much.”

— Dutch resident

For cleaning
It may be more useful in the future
If it was usable
If it was affordable
For emergencies
To better communicate
For better mobility
To better monitor my health
To improve security
For everyday tasks

Tag cloud 5: Views from tenants that would consider assistive technology
5 FUTURE AREAS OF CONCERN FOR TENANTS

This section of the report looks into the future concerns for tenants. This will allow the I-stay@home project to better understand tenants’ fears and explore the assistive technologies that are most appropriate to address these concerns.

5.1 TENANTS GREATEST CONCERNS

Tenants were again presented with the ten aspects of living and then asked to select the three areas about which they were most concerned. As a group, tenants identified being able to get around, see, hear and communicate (53%), mental health and well-being (40%) and being able to look after one’s self and home (34%) as the three main areas of concern for the future. These were followed by health care and health monitoring (33%) and managing one’s financial affairs (30%).

"I need more money. I have no savings, and am living hand to mouth.”
– British resident

"I'm afraid that if I can't move any more, I'll be compelled to go into a nursing home.”
– German resident
Tenants' greatest concerns with regard to looking after oneself and home, was the fear of becoming helpless and being unable to clean, maintain, and care for their abode. With this concern comes another significant fear, which is to be placed into a nursing home.

Tenants who mentioned managing financial affairs as a serious area of concern fear not having sufficient economic resources to deal with whatever challenges lie ahead (financial hardship). This concern took two forms: being able to pay current bills and other outgoings; and the ongoing reductions in social security programmes across Europe and the effect that will have on future resources.

5.2 SPECIFIC AREAS OF CONCERN

All tenants were then asked to mention their biggest concern within each of the above aspects of living. This is an important question to help select assistive technologies that would be oriented towards issues tenants are most concerned about. The findings presented below are only for the areas tenants selected as their top areas of concern.

Tenants who mentioned disability (mobility, sight and hearing) and health care and health monitoring as broad areas of concern highlighted some of the specific issues with which they are most concerned. Tenants indicated that they were particularly concerned with health issues which are degenerative such as muscular dystrophy, Alzheimer’s, and arthritis. The lack of mobility stemming from these illnesses as well as the general frailty of ageing were also expressed as serious areas of concern.

With regard to mental health and well-being, tenants expressed specific concerns with depression, as many tenants indicated that they already suffered from either minor or major depression. Another significant concern was dementia; losing one’s mental faculties is a disturbing thought and many tenants indicated that this was one of their greatest concerns.

Tenants greatest concerns with regard to looking after one’s self and home, was the fear of becoming helpless and being unable to clean, maintain, and care for their abode. With this concern comes another significant fear, which is to be placed into a nursing home.

Tenants who mentioned managing financial affairs as a serious area of concern fear not having sufficient economic resources to deal with whatever challenges lie ahead (financial hardship). This concern took two forms: being able to pay current bills and other outgoings; and the ongoing reductions in social security programmes across Europe and the effect that will have on future resources.
6 FUTURE SUPPORT STRUCTURE FOR TENANTS

6.1 FAMILY AND FRIENDS

Tenants indicated that family and friends will continue to play an important role in maintaining their independence, reducing their isolation and increasing their general quality of life. The challenge for the I-stay@home project is to identify assistive technologies that would help support this important family and friends/tenant support structure.

6.2 SOCIAL CARE

When asked about what they thought the social care system could do to improve their independence going forward, tenants mentioned a wide range of services. They would like a more efficient service, with more visits and more time allocated to each visit so that carers would not be rushed and could be more friendly and familiar with the individual needs of the tenant. Indeed they would like to see more in-home and 24-hour services available. They also indicated that future social care should cost less and there should be greater linkages between the health care services and the social care services. For example, tenants indicated that there should be more in-home doctor visits.

6.3 TECHNOLOGY

Tenants were asked to highlight the types of technological solutions that would assist them in maintaining more independent lives. Interestingly most tenants were not able to think of any solutions, indicating only a very basic awareness of technological solutions.
Where tenants provided a response, the most frequently mentioned technological supports for independence were centred on mobility. This includes solutions such as cars that could be operated by a wheelchair user, walkers, stair lifts, powered chairs, and bus lifts. All of these technologies would remove mobility barriers and would therefore have positive effects on independence.

Tenants also highlighted a number of technological solutions that deal with home automation and daily life organisation. Examples of these kinds of technologies were automatic curtains and doors, lighter, more usable text readers, hearing aids, and more advanced, more nuanced speech recognition software, as well as other technologies designed to take care of everyday tasks.

With regard to safety and security, tenants also expressed great interest in assistive technology that would potentially stop crime as well as help prevent catastrophic health events, such as heart attack and stroke. Some of the most common technologies falling under this theme were home security systems, door cameras to see who is at the door, emergency systems to call for help in an emergency, as well as fall detection technology to detect when an individual has fallen and automatically call for help.

Communication technology was also mentioned as one way assistive technology could be used to increase tenants’ independence, particularly assisting them to keep in touch with distant friends and family. Many participants expressed an interest in video communication technology, which tenants seemed particularly receptive towards. Tenants also mentioned mobile phones, smart phones, tablets, and computers, showing that elderly tenants would try these technologies.

Likewise, the internet was also of interest to many interviewees, despite their frequent lack of familiarity with its use. Recognising that the internet may have a lot to offer, tenants would most likely use it for e-mail communication, general inquiries, online banking, online gaming, and/or online shopping.

Also discussed were products designed to take care of domestic activities. Chief among these were cleaning devices, such as automatic vacuum cleaners.

"I’d be interested in any cleaning or assistive device."
--- French resident

"I would like cameras and motion detectors to protect against thieves."
--- French resident

"A computer and webcam would be really useful for communicating with my family."
--- French resident

Tag cloud 9: Future support from technology
Tenants were provided with a list of possible barriers to adopting assistive technological solutions and asked which act as barriers to adopting technical assistance for key concerns. Three out of four (74%) tenants felt the affordability of the service would stop them from adopting technological solutions to assist with their key concerns. Around half of tenants also considered the awareness of technological opportunities (52%) and usability (50%) would be significant barriers. Conversely tenants are less likely to see data protection (30%) and the stigma (9%) associated with using a piece of technology as barriers.

Figure 4, Sample = 208

<table>
<thead>
<tr>
<th>Barriers to Adoption of Assistive Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affordability</td>
</tr>
<tr>
<td>Awareness</td>
</tr>
<tr>
<td>Usability</td>
</tr>
<tr>
<td>Reliability</td>
</tr>
<tr>
<td>Safety</td>
</tr>
<tr>
<td>Data Protection</td>
</tr>
<tr>
<td>Stigma</td>
</tr>
</tbody>
</table>
Tenants also indicated the two conditions under which they would most likely adopt assistive technology in their home. As illustrated below, it would be if assistive technology was provided by housing associations and/or social services (64% agree) or if assistive technology would help their families (64% agree). Noteworthy, more than two fifths of tenants (45%) would pay for assistive technology themselves if it protected them against their biggest fears.
In conclusion, tenants have provided us with some very useful insights into the challenges they face on a day to day basis and how ICT solutions can play a role in assisting their independence. Tenants indicated that they have greatest difficulties with accessing the internet, getting around (shopping in particular), and cleaning their homes. They rely principally on family and friends for support with social services and technology also playing important roles.

Tenants identified the preservation and maintenance of their independence and financial hardship as their greatest areas of concern going forward. Specifically, they are concerned about becoming disabled, developing mental health problems such as dementia and being unable to look after themselves and their homes.

Encouragingly, most tenants would be willing to adopt new technologies that would help improve and maintain their independence and certainly allow them to stay at home. However the most significant barriers to any adoption of new technologies or ICT solutions would be their affordability, popularity and usability. These barriers become less important if tenants think that solutions would be provided by housing organisations and/or they helped their families in some way.

The findings show that there is indeed a demand for ICT solutions as a mechanism of support working in conjunction with the already existing support tenants receive from family and friends and/or social services. Crucially any solution would need to help mitigate the impact of aging on tenants.
## DEMOGRAPHICS OF TENANTS

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>Percent</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 70</td>
<td>54</td>
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<tr>
<td>Gender</td>
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<td></td>
</tr>
<tr>
<td>Female</td>
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<tr>
<td>Male</td>
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<td>Household Composition</td>
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<td>34%</td>
</tr>
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<tr>
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</tr>
<tr>
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<td>46%</td>
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<tr>
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<td>111</td>
<td>54%</td>
</tr>
<tr>
<td>Source of Income</td>
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<td></td>
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<tr>
<td>Pension (employer)</td>
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<td>54%</td>
</tr>
<tr>
<td>Pension (state)</td>
<td>119</td>
<td>61%</td>
</tr>
<tr>
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<td>3%</td>
</tr>
<tr>
<td>Support from Family</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
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<td>1%</td>
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<td>54</td>
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</tr>
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</tr>
<tr>
<td>Belgium</td>
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THE TESTING PHASE

1 INTRODUCTION

In this phase of the project, we invited the suppliers of potentially useful products to participate in the project by allowing their product to be evaluated by the I-stay@home scientific team to determine their suitability for our tenants. More than 100 suppliers participated in this process, providing us with extensive information about their products. We then evaluated the products with the help of experts in ICT technology, social workers and other people specialised in dealing with elderly and disabled people. The second phase also included the development of a platform, with the purpose of integrating the user interface of the individual ICT solutions to make them more easily accessible to tenants.

With a list of products to choose from, the nine participating housing organisations each selected a number of technologies to test with their tenants and began recruiting for the piloting phase of this project. Each organisation chose technologies on the basis of what would be the most beneficial for their tenants to ensure that the solutions would only have a positive effect on their lives.

This publication presents the ICT products that have been installed in tenants’ homes and are now undergoing live testing to measure their suitability, usefulness and acceptance amongst our tenant base. We present the reasons for which we have chosen each product, the areas of need each product addresses and the countries in which each product is being tested. A description of the platform is also provided.

The I-stay@home consortium wants to disseminate this information in order to inform other interested stakeholders about our progress and to spread knowledge on the potentially useful and innovative assistive technologies which we are now testing. Our findings and the experiences of our tenants will be shared throughout the process on the I-stay@home website and will be published together with an overall conclusion to the I-stay@home project in our final publication at the end of 2015.
2 PRODUCTS TO BE LIVE TESTED

WITHINGS Smart Body Analyzer WS-50

WHAT DOES IT DO?

The Smart Body Analyzer WS-50 is a smart-scale that measures weight and calculates Body Mass Index (BMI) based on height and body fat ratio. It also measures heart rate and household air quality.

WHY DID WE CHOOSE IT?

We chose this product because it is easy to install and has a variety of functions.

One of the key requirements for technology that our tenants described to us was simplicity and convenience. In our opinion, this product offers both ease and convenience of use and enables users to regularly check up on some important measurements of their own health.

Tenants’ doctors may also look at stored measurements using an application.

INSTALLATION AND TRAINING:

The scale must be installed on a hard, flat surface. A user profile must be prepared in advance on the “WITHINGS” application in order to adjust the results to one’s physical parameters. This initial setup takes some time but only needs to be done once.

New measurements appear automatically on the tablet thanks to the Bluetooth system, but they could also be transferred via WiFi. No other input is required.

The air quality control is simple too. One touch on the middle metallic button measures the air quality in the room.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

Yes, it is possible to follow the measurements via the I-stay@home platform.

TESTED IN THESE COUNTRIES:

Belgium, France, Germany, Netherlands

PRICE RANGE:

about 150 Euro

FURTHER INFORMATION ON:

www.withings.com

AREAS OF CONCERN TO BE TACKLED:

Safety  Mental Health  Restricting my diet  Physical Health
Depression  Getting out  Loss of mobility  Socialising
Not being able to look after my home  Communication
VIVAGO Watch - Emergency calls

WHAT DOES IT DO?

The VIVAGO watch can make an automatic emergency call in case of loss of consciousness, hypothermia or a fall.

In addition to manual and automatic alarms from the watch, it is possible to monitor the sleep and activity of the user and use this information to prevent potential problems before they occur.

Furthermore, the watch detects if it is not being worn by the user and can raise an alarm if it is not.

WHY DID WE CHOOSE IT?

Prior to the testing phase, we learned that the VIVAGO watch is discreet, easy to use, and waterproof. We therefore hope that participants will not need to change their habits while wearing the watch. Provided together with care services, the watch can be connected to a medical call centre to offer permanent peace of mind to the individual and their family.

In previous research, our tenants stated they fear being helpless in an emergency, so we will try to mitigate these fears by testing the VIVAGO watch.

INSTALLATION AND TRAINING:

It is very easy to explain the use of VIVAGO as there is only one button to push in case of an emergency or for a test alert. Together with the stationary device for the external call, the installation needs about one hour by a technically skilled person, preferably also provided by a care service provider.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

Yes, work is on-going to make it happen.

TESTED IN THESE COUNTRIES:

Belgium, France, Germany, Netherlands

PRICE RANGE:

Depends on the service that is associated with the watch, but the product is already in use amongst social housing tenants

FURTHER INFORMATION ON:

www.vivago.fr

AREAS OF CONCERN TO BE TACKLED:

Physical Health
Loss of mobility
Mental Health
Restricting my diet
Participating in the community
Not being able to look after my home
Depression  Safety  Communication
Socialising  Getting out
Dementia
SOPHITAL®

WHAT DOES IT DO?

SOPHITAL® is a tool with various possible functions for support at home.

It is for instance possible to switch lights and outlets on or off directly from bed, or to turn everything off when leaving the home. It can also measure the user’s health or activity within the dwelling if desired. To increase security, it is also possible to send an e-mail or emergency call via SOPHITAL® in order to get help when necessary.

WHY DID WE CHOOSE IT?

As many elderly people face problems associated with decreased mobility, we thought it might be helpful for them to install a system that can help them to control their dwelling from a central point or via the tablet PC. Furthermore, as SOPHITAL® offers many flexible functions, it was comparably easy to tailor solutions for the specific tenants’ needs. As a housing provider it was also good that devices can be installed and un-installed without damaging the dwelling.

A number of tenants were particularly interested in functions that increase their security; like the emergency calls, a centralised switch-off when they leave their homes, and a signal in case a window was still open.

Some tenants also liked the function which allows health data to be collected and analysed on behalf of family members or other authorised persons like nursing staff. With this tool, SOPHITAL® can generate advice, support actions or alerts in a timely manner.

Additionally, the SOPHIA service centre is available as a personal contact or service provider for further support if necessary.

“I like very much that I can switch all my devices off at once, when I leave my home. Using this, I do not forget my iron anymore and can save energy at the same time.”

- German resident

INSTALLATION AND TRAINING:

Installation effort varies significantly depending on the chosen functions and individual dwelling facilities. Hence, a pre-visit at the dwelling is necessary to ensure the optimal solution.

Once the equipment is installed, the training also depends on the functions installed. In case further questions appear, the SOPHIA service centre is available for support.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

Yes, work is on-going to make it happen.

TESTED IN THESE COUNTRIES:

Germany

PRICE RANGE:

Depending on functions that should be included, but starting at 395 Euro.

FURTHER INFORMATION ON:

www.sophia.com.de

AREAS OF CONCERN TO BE TACKLED:

Depending on the function.
MiBida

WHAT DOES IT DO?

MiBida is composed of several different modules so that the system can be adapted to the personal needs of the different users.

It can help you conserve energy, make your home more comfortable, communicate better with those around you or take better care of your health.

Users need only pay for the desired modules. Privacy is guaranteed and the user interface is simple.

WHY DID WE CHOOSE IT?

MiBida is a new way of delivering services, arising from the needs of users as opposed to service providers. In the past few years, ICT and the internet have created a lot of new possibilities for social workers. MiBida seeks to capitalise on these possibilities by offering a transparent and adjustable platform on which new services can be easily provided.

It has been developed in cooperation with users. Because it is an open platform, individuals can expand it as they would a smartphone or tablet. It is up to the users which services they want to use; each installation will be unique.

Another advantage is that it protects the data-privacy of users. Within MiBida there is no central server, so data remains private in the house of the user and inaccessible to anyone else.

MiBida is a young company that is already experienced in collecting and making use of the results of a European project (Netcarity).

INSTALLATION AND TRAINING:

Anyone can use MiBida, even those who have never worked with a computer before. It can also be installed as a program or an app on a computer or tablet that you already own, so you do not have to buy a new device.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

No, this is a stand alone solution.

TESTED IN THESE COUNTRIES:

Belgium, Netherlands

PRICE RANGE:

About 1.000 Euro per dwelling

FURTHER INFORMATION ON:

www.mibida.nl

AREAS OF CONCERN TO BE TACKLED:

Depending on the function.
iRobot® Roomba - Vacuum Cleaning Robot

WHAT DOES IT DO?

The iRobot® Roomba is an automatic, robotic vacuum cleaner. You can ask it to clean your apartment or house by simply pressing the “CLEAN” button or you can set it to automatically clean on a schedule.

The Roomba also knows when it has no battery and automatically returns to its base to recharge.

WHY DID WE CHOOSE IT?

We chose the Roomba because it is supposed to be a very reliable and effective cleaner that will only leave a few spots out.

Research with our tenants revealed that they have difficulty cleaning their apartments and often need help in this area. The Roomba may make their life easier. There is no need to go under furniture to recover dust, the Roomba does the job. The only work is to empty the dust bin from time to time.

This product is ideal for the elderly and disabled people who cannot clean their homes themselves.

INSTALLATION AND TRAINING:

The Roomba has turned out to be very easy to set up and use as it only takes the push of a few buttons to accomplish any task, even scheduling it to clean automatically. You can empty the waste bag or clean the spinners without any technical skill as well as with minor manual disabilities.

This product is easy to install too. Our only advice is to put the charging base out of the way to prevent falls.

AREAS OF CONCERN TO BE TACKLED:

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

No. This is a stand alone solution.

TESTED IN THESE COUNTRIES:

France, Germany, United Kingdom

PRICE RANGE:

Starting at 350 Euro

FURTHER INFORMATION ON:

www.irobot.com

“It even goes under my cupboards!” – French resident
WHAT DOES IT DO?

The WITHINGS Pulse and its successor the Pulse O2 count the number of steps taken during the day and calculate the distance covered, calories lost and altitude mounted. It can also measure heart rate and blood oxygen level. When worn at night, it monitors the user's sleep.

All these results can be synchronized with the "WITHINGS" application on the tablet and can be monitored over time.

WHY DID WE CHOOSE IT?

When interviewing our tenants, we found that some are very active people who try to stay fit. For them, we thought it might be worth selecting a product for supporting their activities and helping their motivation.

Some of our tenants cycle, walk, hike or simply keep active but they do not know what distances they cover or the amount of exercise that these activities actually entail. Thanks to the WITHINGS Pulse, they can follow these daily activities and compare their achievements on a day-to-day basis.

Some tenants also welcomed the idea of being monitored in their sleep to help keep track of their wellbeing.

Furthermore, the Pulse looks appealing, is very easy to use and is comfortable to wear.

INSTALLATION AND TRAINING:

The Pulse has a bracelet for night use and a cover that goes on the belt for use during the day. Or, it can simply be put in the pocket.

Connecting the Pulse with the WITHINGS App is done in a few simple steps that only have to be done once. The synchronisation of data to the WITHINGS app is easy too, as the button on the Pulse must simply be pressed a little longer and the data will be transferred.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

Yes, work is on-going to make it happen.

TESTED IN THESE COUNTRIES:

France, Germany,

PRICE RANGE:

About 120 Euro

FURTHER INFORMATION ON:

www.withings.com

AREAS OF CONCERN TO BE TACKLED:

Participating in the community  Dementia
Safety  Mental Health  Restricting my diet  Physical Health
Depression  Getting out  Loss of mobility  Socialising
Not being able to look after my home  Communication
ComfiCare®

WHAT DOES IT DO?

ComfiCare® offers a complete package of various solutions that assist in daily life and can be controlled easily by a simple app on a tablet PC.

Possible functions:

- Video communication
- Agenda sharing with caretakers, family and relatives (Basic)
- Digital control of daily life functions: lights, curtains, sunscreen, windows, etc.
- Control of the front door in the dwelling: by intercom on tablet PC and the ability to open the door from a distance.
- Burglar and fire alarm that can communicate with friends and family.
- Control of energy consumption by controlling the temperature in each separate room in the dwelling on a tablet PC.

WHY DID WE CHOOSE IT?

We chose it because it is supposed to be a reliable product with a clear interface that can offer a variety of functions to fix our tenants’ needs.

Furthermore, in previous research, our tenants stated they have difficulties with moving around in the dwelling and therefore are not able to open the door in time. They also stated that they feel lonely and often do not feel safe.

To tackle these problems, we decided to try out ComfiCare® because it can offer solutions for these needs. We found it useful that ComfiCare® offers a Servicedesk 24/7 to answer tenants’ questions and offer support: the ComfiDesk.

INSTALLATION AND TRAINING:

Installation takes about half a day, as does training. Each tenant therefore has the product and knows the basics in one day. After that they can call the ComfiDesk if they have questions.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

No. This is a stand alone solution.

TESTED IN THESE COUNTRIES:

Netherlands

PRICE RANGE:

The basic package is about 1.500 Euro, the complete package is about 4.500 Euro.

FURTHER INFORMATION ON:

www.comficare.nl

AREAS OF CONCERN TO BE TACKLED:

Depending on function.

“I always struggled to open the door in time for the delivery man. Most of the time I was too late. Now I can talk to him through my tablet PC and let him in!”

- Dutch resident
WHAT DOES IT DO?

LightwaveRF turns a home into a smart home with wireless control of lighting, power, and heating. It accomplishes this through relatively simple retrofitting of existing light switches, power points, radiator controls, and thermostats with wireless versions of the same. These can then be controlled through an easy-to-use app available on any Apple or Android device.

WHY DID WE CHOOSE IT?

We chose LightwaveRF because it is supposed to allow people to control the environment in their home from anywhere. Research with our tenants showed that many had mobility related disabilities that limited their ability to carry out everyday tasks. Lightwave was selected to help assist these tenants in controlling their homes easily despite their disabilities.

INSTALLATION AND TRAINING:

The installation of Lightwave is fairly straightforward and can be done by any electrician. However, we recommend having an electrician carry out a detailed assessment of the individual components that will be necessary in each home prior to purchasing them. This is because of the complexities involved in the way different homes can be wired. Also, because Lightwave uses dimmer switches, dimmable LED bulbs will need to be purchased in addition to the Lightwave system itself.

Training has been very easy, however. The Lightwave app is well designed and tenants are adapting to it quickly.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

No. This is a stand alone solution.

TESTED IN THESE COUNTRIES:

United Kingdom

PRICE RANGE:

450–800 Euro, depending on features selected, plus installation

FURTHER INFORMATION ON:

www.lightwaverf.com

AREAS OF CONCERN TO BE TACKLED:

- Physical Health
- Loss of mobility
- Mental Health
- Restricting my diet
- Participating in the community
- Not being able to look after my home
- Depression
- Safety
- Communication
- Socialising
- Getting out
- Dementia

“This is really going to help me when I am weak and bedridden. Sometimes I have to sit in the dark because I’m too weak to get up. This is going to be a big help.”

- British resident
Ucam247 Outdoor Wifi IP Camera

WHAT DOES IT DO?

The Ucam247 is an outdoor wireless camera which we have installed at the front door of each tenant. The feed can be accessed live from the tablet we have also provided tenants with, allowing them to see who is at their front door at any hour thanks to the camera’s night vision. It also has a built-in microphone and can take pictures of whomever calls.

WHY DID WE CHOOSE IT?

Our research showed that our tenants are affected by mobility-based disabilities that impact their feelings of safety and security. Our aim in piloting the Ucam247 was to provide tenants with a way of seeing who was at their door from anywhere in their home. They can then choose whether to answer the door or not.

INSTALLATION AND TRAINING:

Fitting of the Ucam247 will often require the installation of a new power point on the inside of the dwelling, near where the camera will be installed on the exterior of the dwelling. This is an easy task for any electrician, but will require approximately an hour of work.

Setting up the camera to work wirelessly is relatively easy, but does require some knowledge of wireless networks. Tenants will therefore almost certainly need help with this step. Once set up, however, use of the camera via the tablet and app is very easy and requires minimal training.

AREAS OF CONCERN TO BE TACKLED:

Physical Health
Loss of mobility
Mental Health
Restricting my diet
Participating in the community
Not being able to look after my home
Depression
Safety
Communication
Socialising
Getting out
Dementia

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

No. This is a stand alone solution.

TESTED IN THESE COUNTRIES:

United Kingdom

PRICE RANGE:

About 170 Euro for the camera plus installation

FURTHER INFORMATION ON:

www.ucam247.com

“This will be really useful. A lot of the time I don’t want to come to the door, and now I’ll be able to see who’s there before I go through the effort of getting up.”

- British resident

33
**Stove Guards**

**WHAT DOES IT DO?**

The stove guard automatically turns the stove off in case it is accidentally left on or the user has forgotten an item on the hob. This will help prevent fires. Conveniently, the stove guard does not react for usual cooking activities but only on potentially dangerous use. Furthermore, the chosen stove guards are both capable of communicating with other more holistic systems.

**WHY DID WE CHOOSE IT?**

We chose stove guards because they are supposed to increase safety in the tenants’ homes. Family and caring staff in particular state that elderly relatives will quite often forget to turn the stove off after cooking or will leave it unattended whilst doing other activities. Hence, they would feel safer if the stove could be turned off automatically before it is too late.

**INSTALLATION AND TRAINING:**

An electrician is needed for this kind of installation as stove guards have to be connected to the electrical installation of the stove. Apart from that, the functionalities and troubleshooting actions are explained in less than an hour as there are only few buttons.

**CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?**

No. These are stand alone solutions.

**TESTED IN THESE COUNTRIES:**

Belgium, Germany

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**AREAS OF CONCERN TO BE TACKLED:**

Physical Health  
Loss of mobility  
Mental Health  
Restricting my diet  
Participating in the community  
Not being able to look after my home  
Depression  
Safety  
Communication  
Socialising  
Getting out  
Dementia
INNOHOME Stove Guard Kit SGK500-3CC

WHAT MAKES THIS STOVE GUARD DIFFERENT?

We chose this stove guard because it is wireless and very discreet; a user cannot see any cables coming from the stove guard, which some users prefer over a wired solution.

Furthermore, this product is already well established in Scandinavia, where stove guards are mandatory in the rental dwellings of many countries.

PRICE RANGE:

About 300 Euro plus installation by an electrician

FURTHER INFORMATION ON:

www.innohome.com

SAFERA SIRO R Stove Guard

WHAT MAKES THIS STOVE GUARD DIFFERENT?

We chose this stove guard because it works without a battery which might reduce maintenance. Furthermore, this stove guard is supposed to have the most advanced intelligent technology on the market using various kinds of sensors to determine the danger. In this way, false alarms should be reduced and the stove guard should be more effective.

PRICE RANGE:

Around 400 Euros plus installation by electrician

FURTHER INFORMATION ON:

www.safera.fi
WITHINGS - Wireless Blood Pressure Monitor

WHAT DOES IT DO?

This device allows people to measure their blood pressure and document the results on their tablets.

By pressing the power button on the monitoring device, the application on the tablet opens automatically, the measurement is taken, and the date is displayed and recorded without further effort.

WHY DID WE CHOOSE IT?

People should regularly check their blood pressure starting in their 60s at the very latest. Many of our tenants are no exceptions as sometimes they struggle with high blood pressure or heart problems.

This device helps them to easily monitor themselves. They can do the measuring themselves and do not have to worry about writing the results down as the data are automatically transferred to the application and can be monitored over time. They can also share their results with their doctors without having to look for the old-fashioned notebook. Lying about the results is also no longer possible due to the direct transfer of data.

INSTALLATION AND TRAINING:

Because use is so simple, training is done very quickly. The person must put the monitor around his/her arm, sit in a comfortable position with arms posed on the table as with usual blood pressure measuring and press the button. The “WITHINGS” application turns on automatically, and then displays the results obtained.

Connecting the blood pressure monitor to the WITHINGS app is done in a few simple steps that can be carried out by almost anyone, even someone who is not very technically proficient.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

Yes, work is on-going to make it happen.

TESTED IN THESE COUNTRIES:

France, Germany

PRICE RANGE:

About 130 Euro

FURTHER INFORMATION ON:

www.withings.com

AREAS OF CONCERN TO BE TACKLED:

Participating in the community  Dementia

Physical Health

Safety  Mental Health  Restricting my diet

Depression  Getting out  Loss of mobility

Socialising

Communication

*Great, I can send my results to the doctor by email now!*  
- French resident
SALVEO - Fall alert

WHAT DOES IT DO?

SALVEO is a suite of motion sensors designed to detect and analyse a resident’s movements without the use of a worn sensor. If a user falls, it should detect this fall and alert a designated contact person without an emergency alarm being triggered. Collected data can also be used to analyse other potential risks, such as not rising from bed, infrequent toilet use, or irregular sleeping patterns.

WHY DID WE CHOOSE IT?

We chose SALVEO because it can provide our tenants living alone with a method of detecting falls that does not require them to wear a sensor or activate an alarm. When asked, most tenants indicated that they did not wear their emergency pendants either because they forget or because they do not feel they would be useful were they to suffer a catastrophic fall. A fall detection system that does not require any user input would therefore be very useful to most of our tenants.

INSTALLATION AND TRAINING:

Installation is relatively straightforward, though learning how to place the motion sensors in the rooms does take some time to understand. Once installed, setting SALVEO up requires navigating a web interface can be confusing. However, once set up, there is zero effort for tenants.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

No. This is a stand alone solution.

TESTED IN THESE COUNTRIES:

United Kingdom

PRICE RANGE:

320 Euro per unit plus 50 Euro/year for the web service

FURTHER INFORMATION ON:

www.pervaya.com/en

AREAS OF CONCERN TO BE TACKLED:

Physical Health
Loss of mobility
Mental Health
Restricting my diet
Participating in the community
Not being able to look after my home
Depression  Safety  Communication
Socialising  Getting out  Dementia

“Last year, I had a bad fall and didn’t have my pendant on. Something like this would have been good to have around then.”
- British resident
TabTime Med-E-Lert - Pill Dispenser

WHAT DOES IT DO?

The TabTime Med-E-Lert is an automatic pill dispenser and alarm. The pillbox has 28 compartments with room for twelve pills in each compartment.

You can program up to four alarms per day to sound when it is time for the user to take a pill. The alarm will not stop until the pill has been taken.

WHY DID WE CHOOSE IT?

When conducting research with participating tenants, we found that many of them were taking a lot of medication. Some of them (or their carers) described to us how easy it was to forget to take these medications. At the same time, many of the usual pill dispensers were complicated to use or unattractive in design.

We therefore searched for a superior device that alerts the user when it is time to take a pill. This also protects the user from taking an overdose. This not only helps the user themselves, but is a comfort for the family because they need not be concerned about their loved ones taking their medication regularly.

INSTALLATION AND TRAINING:

It is quite easy to programme the alarms as the device only has three buttons. As a result it can be programmed by almost anyone from the family or with the help of a nurse. Tenants could also do it by themselves according to their own needs, with a little training.

Once the alarm is heard, the person can take the correct dose at the correct time. We do not think that there is anything that could go wrong on the user's end.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

No. This is a standalone solution.

TESTED IN THESE COUNTRIES:

France, Germany

PRICE RANGE:

About 50 Euro

FURTHER INFORMATION ON:

www.tabtime.com

AREAS OF CONCERN TO BE TACKLED:

Physical Health
Loss of mobility
Mental Health
Restricting my diet
Participating in the community
Not being able to look after my home
Depression  Safety  Communication
Socialising  Getting out  Dementia

“With this product, I cannot forget my medication anymore, the sound is so loud!”

- French resident
GEOCARE®

WHAT DOES IT DO?

GEOCARE® is a mobile person-locating system with an emergency call button. It can also raise an alarm if the user leaves a defined zone.

WHY DID WE CHOOSE IT?

Leaving the home and subsequently feeling helpless in an emergency was a key area of concern that we discovered during our research with tenants. We chose GEOCARE® because it may allow our tenants to leave the home confident that they have the ability to raise an emergency alarm should the need arise and family needs to locate them.

By using a GPS system, this emergency call can be used outside of the home and not just within the dwelling.

Furthermore, families feel less worried about their elderly relatives when they are going out. Especially when the relative tends to get lost or is easily confused, they can be automatically notified once he leaves his usual area.

INSTALLATION AND TRAINING:

Installation effort depends on the functionalities that are to be used but can still be done without special technical skills. Training is quite easy, as there are only few buttons to be pushed.

AREAS OF CONCERN TO BE TACKLED:

Physical Health
Loss of mobility
Mental Health
Restricting my diet
Participating in the community
Not being able to look after my home
Depression
Safety
Communication
Socialising
Getting out
Dementia

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

No. This is a stand alone solution.

TESTED IN THESE COUNTRIES:

Germany

PRICE RANGE:

Starting at 24,90 Euro/month as they are mostly to be rented. This already covers costs for calls and answering emergency calls by a help-desk.

FURTHER INFORMATION ON:

www.geo-care.de

“Luckily, I did not have to really use it so far, but I feel much safer now when I am leaving my apartment.”

- German resident
SYBILITY Voice Control PILOT one

WHAT DOES IT DO?

PILOT one is a small and mobile voice remote control. People with a physical disability can control their environment just by using their voice and specially adapted switches. This aids independent living due to a high flexibility in adaption and a wide range of functionality.

WHY DID WE CHOOSE IT?

We chose it because some of our tenants face great difficulties in mobility which makes them dependent on external help by their families or care services. We hope that with this solution, they might become more independent again and life will be a little easier.

Even though the initial cost of the product is comparably high, we still chose to test it because it is often used by care and health insurance providers.

It might be especially interesting for wheelchair users or people who have lost a significant proportion of their mobility.

INSTALLATION AND TRAINING:

As the commands need to be programmed with the person who will be using the device, training might take some time with the user until all the commands are perfectly understood. However, installing the switches and explaining the functionalities of the product are done quite easily.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

No. This is a standalone solution.

TESTED IN THESE COUNTRIES:

Germany

PRICE RANGE:

Starting at 1.100 Euro

FURTHER INFORMATION ON:

www.sybility.de

AREAS OF CONCERN TO BE TACKLED:

Physical Health
Loss of mobility
Mental Health
Restricting my diet
Participating in the community
Not being able to look after my home
Depression  Safety  Communication
Socialising  Getting out  Dementia
En:key - Heating control

WHAT DOES IT DO?

The En:key can automatically turn the heating in the room down when a room is not in use anymore. It also adapts to users’ habits.

WHY DID WE CHOOSE IT?

One of the key aims of the project is to reduce energy consumption in tenants’ homes with the help of technology. This is a key aspect for many participants as they need to reduce their costs where possible. Tenants do not have to remember about their heating but have the ability to save energy without much added effort. Some tenants might also appreciate that they can help preserve the environment at the same time.

Furthermore, it might support people’s health and wellbeing if the climate and temperature in rooms are automatically adjusted to healthy levels without constantly having to keep an eye on the thermostat.

INSTALLATION AND TRAINING:

Not very high. Once the idea is made clear, it can be installed quite easily. Not much knowledge is required to program the settings.

CAN IT BE INTEGRATED IN THE I-STAY@HOME PLATFORM?

No. This is a stand alone solution.

TESTED IN THESE COUNTRIES:

Germany

PRICE RANGE:

About 250 Euro per radiator control set

FURTHER INFORMATION ON:

www.enkey.de

"I hope I will see the benefits on my bill."
- German resident

AREAS OF CONCERN TO BE TACKLED:

Participating in the community  Dementia  Physical Health
Safety  Mental Health  Restricting my diet  Socialising
Depression  Getting out  Loss of mobility
Not being able to look after my home  Communication
3 I-STAY@HOME PLATFORM

WHAT DOES IT DO?

The I-stay@home platform should bundle independent ICT solutions that will assist elderly and/or disabled tenants live independently. The platform helps facilitate the use of these products by making them as user-friendly as possible.

WHY DID WE CHOOSE IT?

The IT-platform is one of the core elements of the project. It is a prototype developed within the project with the purpose of testing the above concept.

INSTALLATION AND TRAINING:

As the platform is developed for web-based access, the installation effort on tenants’ tablet PCs is almost zero except for a log-in procedure. However, tenants must have internet access and it may take some work, depending on the individual tenant, to familiarise them with the use of a tablet PC in the first place.

TESTED IN THESE COUNTRIES:

France, Germany, United Kingdom, Belgium, Netherlands

PRICE RANGE:

Only prototype status with business model to be developed at the end of the project

FURTHER INFORMATION ON:

www.i-stay-home.eu

“I could use the Withings app also on its own, but it is nice to have it all in one place.”

- German resident

“I like the notice board to get in contact with the other I-stay@home users. It is really fun when they answer to messages but it takes me such a long time to write them.”

- German resident

Physical Health
Loss of mobility
Mental Health
Restricting my diet
Participating in the community
Not being able to look after my home
Depression Safety Communication
Socialising Getting out
Dementia
3.1 HOME PAGE

Once logged in, the user enters the main page:

Primary use of the platform is through the central panel containing six access functions:

- **My profile**: the user can check his own information
- **My demands**: the user can submit requests to his platform provider (the housing organisation)
- **My notice board**: the users can share short notices with each other
- **My services**: the user can access his data from externally connected products
- **My contacts**: the user can add people to his contact list and chat or send messages to them
- **My sharing**: the user can share files via GoogleDocs.

Standard functions such as log-out, notification alerts in case a message was received or a chat conversation is active, and information about date and local weather were also stored in the frame panels.

For users who suffer from disabilities limiting their use of the keyboard or with sight impediments, the ICT platform also includes:

- Integrated voice synthesis (text to speech)
- Integrated vocal recognition (speech to text)

Housing organisation employees can manage the home page by deciding which functions can be accessed and selected by the user in the central panel.

The functions are described in short as follows:

3.2 MY PROFILE

By accessing the “My profile” menu the user can see his personal information:
3.3 MY DEMANDS

Under “My demands” it is possible to enter demands in a very structured way, following a clear path to facilitate use. For the testing purpose, the demands structure was focused on the products that were tested. Each housing organisation (as service provider for the duration of the project) could manage this section itself and enter only those products that were actually used by their test participants in order to minimise confusion and facilitate use.

ADD A NEW DEMAND

The entry process for adding a new demand is divided into two steps. First a category has to be selected from the displayed list box.

After selecting a category, the new demand can be entered and sent to the service provider. Upon receiving a demand or request an automatic e-mail is issued which informs the housing organisation about the new demand.

MY DEMANDS

After having entered one or more demands, the user can have an overview of his submitted demands. At this level, he can also view replies from the service provider and monitor the status of any requests.

During the testing phase, it turned out that many users were interested in this function, but preferred to call the service provider directly in case of a malfunction instead of submitting the demand through the platform. For them, calling was just the quicker and easier way.

3.4 MY NOTICE BOARD

As one of the most requested functions, the I-stay@home platform offers a social market place to facilitate communication between users and probably bringing them closer together within their neighbourhoods.

The users’ notice board is divided into the following three categories:

After selecting a post all replies are displayed, or new replies can be posted.

A reply can be entered manually by keyboard or verbally by activating the microphone icon.
3.5 MY CONTACTS

Under “My contacts” the user can manage his contacts without the necessity of using their e-mail account. Once a contact, the user can start a video conference, text conference (chat) or delete the contact again.

Under “Add contact” the tenant can also invite an external contact (people not registered on the platform, for example: family, friends…) to the platform by sending an e-mail invitation to the recipient which has to be confirmed by them.

The home page of an external contact offers only a limited number of functions.

3.6 MY SHARINGS

Basically, I-stay@home users had the option to test the multimedia sharing platform based on Google’s tools like “Google docs©” for document management and “Picasa©” for photo management.

In order to be able to use those functions the user must have a Google user account and a Gmail address. However, this function was not the focus of testing, since users expressed more interest in other functions.
3.7 MY SERVICES

Since the primary aim for the I-stay@home platform was to integrate external services into one user interface to deliver the same look and feel and to facilitate the use of ICT for the elderly people, four products and services from the fields of health monitoring, security, comfort and energy consumption were integrated into the platform. Additionally, a small entertainment section was added, leading to web radio services and a link to the I-stay@home product catalogue for information on further products and services on the market.

Participants had to subscribe to the services they were actually using in advance of using them, to avoid excess useless information on the users’ interfaces. Often, the housing organisation as service provider managed this process in advance of introducing the platform to the user.

Here are examples of integrated products:

WITHINGS PRODUCTS: WEIGHT SCALE, BLOOD PRESSURE & HEART RATE MONITOR

The user can follow the history of his health data.

INTENT TECHNOLOGIES PRODUCT: ENERGY COACH

With this product the user can access different information concerning the energy consumption of his dwelling such as general electricity consumption in kWh, general water consumption in m³, general heating consumption in kWh and dwelling temperature in °C.
VIVAGO PRODUCTS: WATCH ALARM & ACTIVITY SENSOR

The VIVAGO wrist watch measures activity and sleep data of the user which can then be monitored on the I-stay@home platform.

Measures for the activity data are shown through graphics, as follows:

SOPHIA PRODUCT: SOPHITAL®

SOPHITAL® is a tool with various possible functions for support at home. It is for instance possible to switch lights and outlets on or off directly from bed, or to turn everything off when leaving the home. To increase security, it is also possible to send an e-mail or emergency call via SOPHITAL® in order to get help when necessary.

In its comfort version, SOPHITAL® offers a web access, which could be integrated into the I-stay@home platform as follows:

3.8 Findings

All in all, the platform offered various functions, the need for which was determined by initial research amongst tenants in the beginning of the project. However, when it came to presenting and testing the functions, it became clear that users enjoyed the tablet as it was and could get used to apps as they were on the market, without needing a special platform designed for them. Nevertheless, it was technically possible to integrate external products into a bundling platform and present them within the same interface, look and feel, which was an objective within the project. For users, the most appreciated function was the virtual notice board to get in closer contact with the neighbourhood.
Learning by Doing

1 Introduction

With a list of products to choose from, the nine participating housing organisations each selected a number of technologies to test with their tenants and began recruiting for the piloting phase of this project. Each organisation chose technologies on the basis of what would be the most beneficial for their tenants to ensure that the solutions would only have a positive effect on their lives.

This part of the publication presents the experiences of selected tenants throughout the testing process, the experiences of housing organisations as service providers for this testing phase, and an excerpt from the scientific evaluation of tenant experiences. At the end of the project, it was important to understand how the different perspectives experienced the project in order to draw conclusions for the future about the I-stay@home approach.

Basically, tenants were very satisfied with the I-stay@home technology and for some of them it meant a real improvement in their lives. Most housing organisations found this was very encouraging, motivating them to work on a concept for the future which will include assistive technology for elderly or disabled people.

However, they also found that social support was essential to train participants in using the technology and to make them feel comfortable with it in their everyday lives. Housing organisations tried different approaches to support their participants during the testing phase such as consultation hours, telephone hotlines, regular individual training sessions or collaborating with external social service providers. All in all, each strategy turned out to be successful in terms of tenant satisfaction.

As the chapters about tenants’ and housing organisations’ experiences are based on informal interviews and exchanges among participants, the scientific evaluation is useful for confirming or substantiating these findings through quantitative means derived from two surveys amongst participating tenants and a comprehensive interview with housing organisations. The extract in this publication concentrates on defining a potential target group for whom I-stay@home-technology would be particularly beneficial, exploring the willingness of people to pay for this kind of support, and defining housing organisations’ influence on the satisfaction of tenants.
2 TENANT EXPERIENCES

2.1 INTRODUCTION

This chapter reports on tenants’ experiences during the product testing phase of the project and lessons learnt about how information communication technology (ICT) can aid independence amongst elderly and/or disabled people. The information for the chapter is based on formal interviews and informal conversations that were held with tenants.

The chapter contains three broad sections: the first describes how ICT has helped improve the independence of tenants; the second communicates how tenants learned and adapted to the ICT solutions; and the third presents some of the tenants’ favourite pieces of ICT.

2.2 ICT AND TENANT INDEPENDENCE

In research conducted earlier in the project, tenants’ most common concern as stated in their own words was “independence”. When asked to elaborate on what their specific concerns were, over half (53%) of tenants indicated that getting around was a concern; two in five (40%) indicated that their mental health was concerning; more than one in three (34%) indicated that their ability to look after themselves and their home was concerning; and one in three (33%) stated that their health care and ability to monitor their own health concerned them. When asked whether they would be willing to use ICT to improve their independence, three in five (61%) indicated that they would be willing, while 62% indicated that they would accept ICT if it helped their family.

With these needs in mind, tenants were provided with ICT solutions that would indeed help them maintain their independence and assist their friends and families in fulfilling their support roles. Tenant experience over the year-long product testing exercise can be summed up under the following headings: daily use of ICT, safety and security, health, communication, and media consumption.

DAILY USE OF ICT

Daily use of ICT was the most significant theme that emerged from the pilot. Tenants consistently reported the frequent use of ICT to engage in what they called “daily”, “every day”, “routine”, “simple” or “normal” tasks. They indicated that the daily use of these products increased their sense of independence and engagement with modern technology. For example:

- Tenants with the wireless door entry system indicated that it allowed them to see who was at their door at all times from anywhere in their homes, and used it on a daily basis.

- Tenants with the pedometer or health-monitoring watch carried them everywhere with them to measure their vital signs and activity levels.

- Individuals testing the hoover used it frequently throughout the week, because they were able to clean the floor as often as required with the press of a button.

- The tablet-controlled technologies, such as wireless light switches, gave tenants greater freedom within their homes as they were able to control key features from their gardens, bathrooms, kitchens, and bedrooms. Some tenants reported that they used their tablets so much that they started carrying them everywhere with them.
Tenants indicated that free applications in the Google Play Store also gave them easier access to services that they previously found challenging to access, such as such online banking and/or shopping. They said that having an intuitive tablet PC allowed them to do these things more easily, without needing to leave their home.

SAFETY AND SECURITY

Tenants reported that they feel safer and more secure because of some of the ICT products that were installed in their homes. Several of the technologies offered to tenants were offered with this in mind. For example, tenants tested cameras which allowed them to see who was at the door, and stove monitors which switch off the hob in the event that they had forgotten to do so. Tenants reacted positively to these solutions.

Tenants also used ICT to monitor their health, with the objective of alerting them, their family, or health care professionals if something were to go wrong. Tenants expressed that this increased their sense of security.

“Being able to do things by myself, it’s a boost. I don’t like asking people for help, and it makes you feel a bit more – if I can use the term – more ‘normal’. It takes away some of the disability. Being able to just, you know, clean up, or turn off the lights. To me, it means a lot. I use this stuff every day.”
- British resident

Overall, tenants emphasised that the ICT solutions related to safety and security (directly or indirectly) were some of the most useful because they offered direct help for pressing concerns.

“The stove guard has already saved my mother and her apartment three times!”
- German resident

“‘When there is someone at the door, I can see who it is through the camera. If I know them, I can use the tablet to let them in. And if I don’t know them, I can just ignore them.”
- Dutch resident
HEALTH

Tenants tested a number of health-related ICT products, and the benefits provided to them fell into two broad categories: improvements to their physical and mental health.

First, tenants used ICT to gain direct access to information about their own physical health. For example, several housing organisations gave their tenants blood pressure monitors, digital scales and activity monitors that connected to their tablet PCs. These allowed tenants to better monitor their own vital statistics and activity levels. Participants told us that being able to access this information motivated them to take better care of themselves, improving their physical health and increasing their sense of independence.

Second, tenants indicated that many products provided them with an unforeseen benefit to their mental health. For instance, learning to use a tablet PC gave some tenants a boost to their self-confidence or made them feel useful again. Others said that the simple act of learning something new had helped them to maintain their mental agility.

COMMUNICATION

Participants were also positive about using ICT to communicate with friends, family, and the outside world. Research conducted earlier in the project indicated that disabled and elderly tenants often struggle to leave the home, which left many feeling lonely or isolated. Tenants were often able to easily connect the tablet to social networking, video-chat and messaging apps, which they then used to reconnect with friends and family.

Tenants also expressed that they were pleased to be able to join the electronic world. They learned to use e-mail and web-based forums to take part in conversations with new people from around the world on topics which interested them, such as politics or religion.
Tenants said they enjoyed being able to access many forms of media through the tablet to which they did not previously have access. In some cases, this was because of a disability that prevented them from using a normal computer; in other cases, it was because they did not know how to use a computer. Once tenants had experienced the range of media available on the tablet, they reported becoming very engaged.

Tenants said that the ability to consume digital media without the assistance of another person was an empowering and liberating experience. Some used this to educate themselves about a variety of topics. Others used it to watch television or listen to the radio. Many tenants reported finding something that interested them online, which they said helped them feel like they were part of the world.

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“The tablet is so light, so much lighter than that laptop I have, that I can actually use it. I can watch television programs on it, I can browse the internet, read the news... these are things I could have used my laptop for, but didn’t because it was painful for me to do so. So, this tablet has really opened the world up to me.”

- British resident

“I feel like I can learn things now...”

- French resident

“It’s a way to meet new people. The radio, the games, yes...”

- Belgian resident
2.3 TENANTS LEARNING ICT

Many tenants starting the pilot expressed that they did not know how to use ICT products, including computers. Learning to use ICT products was therefore a primary task for them, and housing organisation staff observed the emergence of several patterns throughout this process. The staff observations and tenant experience fell into four broad categories: the learning process in the use of ICT products, the use of the tablet itself, the use of other products, and the benefit of family and friends’ support in the learning process.

THE LEARNING PROCESS

The majority of tenants expressed apprehension about using ICT at the outset of the pilot. They were interested in learning ICT because they thought technology could benefit them, but many were afraid that they would not be able to learn it or that learning might be very difficult. However, after some time tenants reported that learning to use ICT products was much easier than they had expected. At the end of the year, most tenants were so comfortable with the use of ICT products, particularly the tablet, that they in fact wanted more ICT products, and wanted to learn more about their use. Housing staff indicated that this change was transformational and that tenants were surprised at how easy learning was.

Tenants found the products generally useful for them. In various ways though, since some of the products are easier to approach (like the Roomba for instance), and some required training. The tenants didn’t always immediately say “this product is designed for me”. In fact, the more they told themselves this, the less training was required because they learnt by themselves. And the more they told themselves “this is not for me”, the more support and training were needed to overcome this obstacle. The conclusion is simpler for the tablet: several hours of explanations had to be spent with the tenants to make them understand how it works.

“I’m not very good at this sort of thing. You’ll have to show me time and time again, I just don’t have the kind of memory for it and I’m afraid I’ll just get frustrated.”

<Six months later>
“I feel so much more confident to just hop on and try something new out. This tablet is great, because I really feel like I can’t mess it up so I’m not afraid of just experimenting with it to learn something new!”

- English resident

“At first I was frightened. I did not like the computer, and I didn’t know what it could do for me. Today, I know it can help me!”

- French resident
USING THE TABLET

Most tenants learnt very quickly how to use the tablet because they considered it easy to use and its user interface quite intuitive. When first introduced to the tablet, tenants for the most part expected its use to resemble that of a computer with a mouse and keyboard. However, tenants found that the touch screen used to control the tablet was much easier to use than they had anticipated. Tenants indicated that the touch screen interface made the tablet quite accessible.

Tenants also said that another element of the tablet that made it easy to use was its ergonomics. Many tenants faced specific challenges in the use of laptop computers, due to a variety of disabilities such as the inability to use a keyboard or mouse, to sit up at a table or desk, or hold the laptop on their body. Tenants said the small size and light weight of the tablet made it much easier for them to use.

USING OTHER PRODUCTS

Tenants had indicated in earlier research that usability was a significant barrier to their adoption of ICT. Therefore, amongst the non-tablet products offered to tenants, an effort was made to only provide technologies that were straightforward to use. For example, the robotic hoover which tenants were able to activate with the press of a button; or the pedometer, which tenants could place in their pockets. Overall, tenants were pleased with how simple the ICT products were to operate, as this was not what they expected.

THE BENEFIT OF SUPPORT FROM FRIENDS AND FAMILY

Tenants said that when they needed advice about the ICT products, and housing organisation staff were not available to help, it was invaluable to have a friend, family member, or neighbour to which they could turn. Housing organisation staff also noted that tenants receiving help from family and friends learned how to use ICT more quickly than those who did not receive such support. In some communities, tenants reported offering help, support and advice to one another, becoming a resource for others to draw upon.

This highlights the importance of support of family and friends in the learning process and adoption of ICT products and solutions. The future use of ICT solutions can be made much more effective if there is an existing support network for tenants.
2.4 TENANT FAVOURITES

The most popular ICT products with tenants were the tablet, door opener and door camera, wireless light switches, robotic hoover, stove guard, and activity tracker. This shows a strong preference towards products that helped tenants live what they called “a more normal life” by taking care of day-to-day tasks, as well as products that enhanced their feeling of safety and security.

“...It lets me escape to another world. It takes me outside!”
- British resident about the tablet

“Now I can let the mailman in when he has a package for me. Normally he is long gone by the time I reach the door!”
- Dutch resident about the door camera and opener

“I compete with my wife about who can do more steps a day! She wins every day, but it gets us to stay active.”
- Another German resident about the activity tracker

2.5 CONCLUSION

At the conclusion of the pilot phase, a majority of tenants indicated that their experiences with ICT products and solutions have been overwhelmingly positive. More importantly, tenants reported that the ICT products they have learned to use have had a positive impact on the areas of concern described to housing organisations in previous research. Tenants had said that their most significant concerns were about getting around, mental health, caring for themselves and their homes, and their health. Throughout the pilot, tenants have indicated that the tested ICT products have had a positive impact in all of these areas of living. They have also indicated that the products had a positive effect on their independence.

“It’s so good, it even goes under the wardrobe! I could never go there.”
- French resident about the robotic hoover

“Is it possible for me to buy more products even though I haven’t tested them? My neighbour is so happy with the stove guard, and I think it could be useful for me as well!”
- German resident about the stove guard
3 HOUSING ORGANISATIONS’ EXPERIENCES

3.1 INTRODUCTION

This chapter reports on housing organisations’ experiences during the product testing phase of the project and lessons learnt about the different aspects that piloted services provided.

Social housing organisations decided to participate in the I-stay@home project to provide new services to elderly and disabled tenants that would improve their comfort and wellbeing. Organisations were interested in testing new technologies that could give tenants the opportunity to stay longer in their own homes with added safety and comfort. The different ICT solutions that they were able to test during the project were selected for their ability to fulfil these objectives.

The information for the chapter is based on formal interviews and informal conversations with participating housing organisations.

3.2 PREPARATION FOR TESTING

Each social housing organisation had to install and test a number of ICT products chosen from the previously established Wiki database. These solutions were to be tested in the real-life environment of tenant homes.

The first task was to locate tenants willing to participate. There were mainly two approaches housing organisations took. Some contacted tenants directly based on their age, disability, or personal situation and then provided them with the products. Others preferred to recruit the assistance of local organisations, such as social centres or neighbourhood associations, to contact tenants and convince them to participate. To recruit enough participants, each housing organisation had to contact more tenants than it needed to take part, because some tenants were not interested in participating in the project. Several housing organisations indicated that people did not believe the project was actually intended for them, that they had been contacted in error. Other tenants initially believed that the housing organisation intended to charge them for the products. When tenants were made to understand that products were both free and indeed intended for them, many objections fell away. Most participating tenants were on low, fixed incomes, so being assured that participation in the project was not going to cost them anything helped to convince many tenants to take part.

In some countries, recruitment was more difficult due to cultural factors.
3.3 Product Choice

In most cases, the choice of which products to install in each home was based on the personal needs of the tenant. Mobility, health, and household composition were some of the many things considered.

Early research showed that tenants were not willing to purchase products, with the exception of disabled tenants who would be willing to spend money to increase their comfort. It was interesting to see through the course of the pilot whether this attitude would change over time; if, after using ICT for free, participants would then indicate that it was worth investing in.

Each tenant was provided with at least three different products. Some housing organisations left the choice very open and offered tenants any product that was technically feasible in their dwelling. Others offered a very limited number of products according to their organisation’s interests, leaving tenants relatively little choice. Still other housing organisations found a way between. However, all participants were required to be provided an internet connection and a device to access the internet. For almost everyone, this device was a tablet PC.

3.4 Installation

Before starting installation, it was necessary for housing organisation staff to learn about the hardware and software of the products to be installed. Employees in charge of the installation had to have a basic knowledge of the functioning of each product so that they could configure them and make them usable for the tenant. In ideal cases, product setup could be done before meeting with tenants for installation so that the product was “plug-and-play” on the day. It was very important that tenants have a good installation experience with very few disturbances, so that they would not be scared away by their first contact with the technology. A bad installation experience might prevent a tenant from properly testing a product, or might give them a negative attitude towards it from the beginning.

Most housing organisations decided to prepare the tablet PCs in advance. This meant creating e-mail addresses, adding necessary apps, removing unnecessary apps, and so on. This preparation reduced the amount of time spent on subsequent technical issues and allowed staff to concentrate on teaching tenants how to use the tablets in that first session.

Housing organisations ran into a number of difficulties during installation. A small number of products, such as the stove guard or Wifi link, required the services of an electrician to install the device, but only some housing organisations chose these products. Another issue that many housing organisations encountered was that not every tenant had access to the internet, so in some cases, the social housing organisation had to install an internet connection in addition to installing the I-stay@home products. Sometimes, housing organisations also encountered problems with particular products that they were not able to solve. When very specific knowledge was required to install a product, suppliers or more experienced I-stay@home partners offered their assistance as “flying experts”.

Overall, some products required very little time to be installed; others were more work, taking time and effort to navigate sometimes considerable technical issues.
3.5 INTRODUCING THE TECHNOLOGY

When introducing tenants to installed technologies, housing organisations had to explain and demonstrate the functions of individual products, how the internet itself works, and how the tablet is operated. Depending on the products and the tenant’s pre-existing level of familiarity with ICT, introductions usually took between two and six hours.

Teaching the tenants what the internet was and giving them a minimum of IT literacy was a real challenge. Housing organisations avoided giving tenants technical explanation, and in most cases, their goal was not to teach tenants to use all of the functions of their products. Instead, each housing organisation focused on simple explanations to enable the tenants to use the basics comfortably. To provide additional support, some organisations gave their tenants brief, written instructions in very accessible language that included pictures. Still, even after instructional sessions, tenants would frequently ask for more information, both by phone and in person.

All of this shows that even though products were chosen to be as easily accessible to elderly and disabled people as possible, it still took some effort on the part of the housing organisation to teach many participants just the basics of what they can do.

To help tenants feel more at ease with their products, some housing organisations chose to tutor participants in the use of ICT throughout the pilot project. Different housing organisations developed their own strategies. Some organisations trained tenants collectively at the beginning of the project; others gave tenants the option to contact a member of staff by phone anytime; other organisations sent staff to visit tenants regularly, to see if they had questions and to teach them new things. Several housing organisations sought to train tenants’ friends and relatives as well, because they were able to give advice and support to tenants in the absence of a staff member. Yet, it is also important to think of the people who cannot rely on relatives and neighbors.

3.6 MALFUNCTIONS

Throughout the pilot, housing organisations also dealt with technical problems with various products. Some examples of this were malfunctions in apps on the tablet, a weak Wi-Fi signal, or a wireless camera that needed to be reset. Even if malfunctions did not prevent a tenant from making normal use of the product, they were still problematic because tenants were aware that their equipment was not functioning as it should be, which did not inspire their confidence. Housing organisations therefore sought to solve all malfunctions as soon as they were able to. Once they were shown some basic means of troubleshooting, participants were often able to solve many issues themselves.
3.7 FINAL WORDS

According to research conducted throughout this project, both tenants and housing organisations report that the biggest problem with ICT is that it is still too expensive for elderly and disabled people with low income. Housing organisations also have a secondary concern in installing ICT that they could then bear responsibility for its maintenance. Finally, many housing organisations ask where the limit to what services they provide lies. Do they offer environmental control products? Self-monitoring health products? Emergency service products? The answers to these questions vary between countries and individual organisations.

Looking past these issues, the products themselves are beneficial to tenants. But it is important to stress that they are only supplementary; they cannot replace human support.

The project also revealed the importance of tenants learning to use ICT. An organisation will not be able to simply purchase these products and give them to tenants; extra resources must be allocated towards teaching a tenant how to use them. This instruction could come from the housing organisation itself, but would preferably be done in partnership with social services, family, or friends. The I-stay@home products improve the quality of life of the tenants, giving them valuable tools to remain autonomous, but do not replace the use of other services, such as visiting the doctor. Their added value is in improving the efficiency and accessibility of other services, not in replacing services completely.

I-stay@home has demonstrated that as a result of the ageing population, social housing organisations must rethink their policies. Housing organisations can no longer be “just a home provider”. They will need to propose services to tenants that make it more attractive for them to continue living in their own homes. Housing organisations should be able to offer options to tenants to make their homes more comfortable and to provide better access to external services that could be brought into their home via ICT. Homes now have not only to be accessible, but must also adapt to the ever-growing ICT solutions available in the market today. As has been demonstrated here, the price of doing this is still too high to be supported by housing organisations in their regular investment plans, but they need to encourage this market to adapt to the needs of a low income population. To accomplish this, housing organisations might consider forming partnerships with insurances companies, health care organisations, home services or any other businesses related to the home.

Each housing organisation has noted the positive impact of the I-stay@home project on their tenants, and all continue to search for possibilities so that they may continue the project’s work.
4 EXTRACT FROM SCIENTIFIC EVALUATION OF PILOT SITES

4.1 SCIENTIFIC EVALUATION OF PILOT SITES FROM TENANTS’ PERSPECTIVE

INTRODUCTION

Housing organisations participating in the I-stay@home project have positioned themselves as suppliers and tenant contact points for the I-stay@home system, regardless of whether or not product testing was to be implemented in cooperation with suitable service providers.

An important task for housing organisations was to define the potential participant group as closely as possible to understand the expectations they might have of technology, because the needs and desires of tenants would factor significantly in their satisfaction.

Two interviews were conducted with each participant to determine the target group’s degree of satisfaction: one shortly after installation of products and one near the end of the testing phase.

Altogether, there were 150 households in the various countries, who were equipped by nine different housing organisations with the following technology (see table 1).

From amongst these 150 tenants, 146 initial interviews were conducted followed by 122 concluding interviews.

Because housing organisations were unsure how easily tenants would accept ICT if left on their own with it, an early decision was made that housing organisation staff should advise tenants directly on the use of tested products. The goal of this initiative was to achieve a high rate of ICT acceptance and satisfaction amongst participants.

In selecting products, housing organisations focused on services that would have a positive influence on their tenant’s quality of life.

PRODUCTS BEING INSTALLED, PILOTTED AND EVALUATED

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<td>VIVAGO Watch</td>
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<td>All WITHINGS Products</td>
<td>WITHINGS Weight Scale</td>
<td>Stove guard</td>
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Table 1: Equipment status of products being piloted
First, housing organisations made available to tenants a broad range of service measures, such as consultation hours, hotlines, written instructions and house calls (see figure 1). Broadly speaking, these services were received as being helpful (see figures 2 and 3).

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**Figure 1: Availability of specific housing organisation services**

![Bar chart showing the availability of different housing organisation services.](image1)

**Figure 2 and 3: Helpfulness of specific housing organisation services**

![Bar charts showing the helpfulness of different housing organisation services.](image2)

The option “insufficient” was not chosen by any of the respondents.

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*Figures 2 and 3: Helpfulness of specific housing organisation services*
The first interview measured how participants valued the individual services provided by housing organisations.

Results from both the first and second interviews indicate a general contentment with housing organisation services before and during the testing phase. 45% of participants rated housing organisation service as “excellent”, while 38 to 43% rated them as “good”. Over the course of the project, some opinions changed from “good” to “indifferent”, while negative ratings changed relatively little.

Relevant data was statistically analysed to examine the possible connection between the products provided to tenants and their satisfaction. Demographic data gathered from tenant interviews provided possible parameters for defining the project’s target demographic.

The first analysis made was to examine how far the use of tested products might have improved the quality of life of participating tenants.

The survey showed that half of the participants said using I-stay@home products had improved their quality of life (“very much”, “yes” and “fairly”). On the other hand, 10% of participants indicated that use of the technology did not improve their quality of life.

Demographic variables such as age, gender, education or migration backgrounds seemed to have little effect on this finding. It was noted, however, that participants without children reported a more pronounced improvement to quality of life than those with children. Some participants with children even reported that technology had a negative impact on their quality of life.

Following this, it can be tentatively stated that childless tenants are more likely to benefit from a more significant increase in quality of life through I-stay@home products than tenants with children.

Furthermore, participants who reported only having a small amount of social contact with others were more likely to rate the influence of I-stay@home-technology on their quality of life as positive or neutral. Such participants gave no negative ratings at all. Amongst this group, responses about quality of life between the first and second interviews changed significantly in a positive direction, indicating that their outlook improved over the course of the project.

Tenants living alone or with a partner also tended to be more positive about the ability of the technology to improve their quality of life.

Taken together, the initial indication seems to be that the use of I-stay@home-technology can improve quality of life, particularly with socially isolated tenants with moderate income and education. Gender and immigrant status seem to be less significant factors.
The next significant question posed by this research was “How is your general satisfaction with the I-stay@home-technology” (see figure 4).

Two thirds of the interviewees stated that they were either “satisfied” or “very satisfied” with the products they tested. A small group also expressed that they were not satisfied, which did not change significantly between the two interviews. Broadly speaking, this is a high degree of satisfaction.

There were few or no significant demographic deviations related to satisfaction.

Level of income was also compared to satisfaction. Results show that tenants who were dependent on financial help from family or friends tended to rate I-stay@home-technology more negatively during their first interview, while financially independent interviewees were more satisfied in both interviews. The group of disadvantaged tenants experienced a shift from negative expectations to a positive one between the two interviews. This could be a result of growing familiarity with ICT or reduced prejudice through regular contact with housing organisation staff.

Significance tests between tenant satisfaction and affluence indicates that there is a connection between moderate income groups and high satisfaction.

Approximately 70% of participants indicated that they would be willing to pay for the technologies provided to them. The average amount tenants would be willing to spend in one lump sum was roughly 172,00 €, or if asked to pay a monthly rate, 15,00 €. Some more affluent tenants were willing to spend more (see figure 5).
Broadly speaking, it can be cautiously stated that use of I-stay@home-technology has generated a high level of satisfaction especially amongst socially isolated, childless and less affluent tenants, independent of gender or migration background, as long as the provided technology does not exceed an average initial cost of 172 € or a monthly fee of 15 €. Low levels of satisfaction in less affluent tenants can be increased by providing them with instruction, in this case by housing organisations.

The above results can be used to assemble a demographic profile for the group that I-stay@home-technology would serve best:

1. Age: Irrelevant
2. Gender: Irrelevant
3. Household composition: Alone or with a partner
4. Social background: Childless or socially isolated
5. Financial background: Average to affluent, needs social services
6. Level of education: Average to high
7. Migration background: Irrelevant
8. Physical disadvantages: Irrelevant
9. Available budget: 172 € in one lump sum or 15 € monthly

This research indicates that demographically potential tenants face only minor challenges in implementing ICT to significant benefit. There is therefore a large target group with significant market opportunities.

POSSIBLE CONNECTION BETWEEN HOUSING ORGANISATION’S SERVICE PACKAGE AND SATISFACTION OF TENANTS

Significance tests between the questions “Does using the I-stay@home-technology improve your quality of life?”, “How is your general satisfaction with the I-stay@home-technology?” and “How was the service of the housing organisation overall” indicate a positive correlation between the level of support provided by the housing organisations and the satisfaction tenants expressed with technology. There was also a positive correlation between tenant satisfaction with housing organisation services and the improvements to quality of life indicated by tenants.

This implies that participants who indicate that their quality of life has significantly improved through the use of I-stay@home-technology show a tendency to perceive the housing organisation’s service as “very good”. The reverse can also be assumed, that an extensive service package is able to further increase quality of life improvement already provided through I-stay@home-technology. There is, however, no correlation between negative perspectives on the technology and poorly reviewed service by the housing organisation. Thus it can be assumed that a poor review of technology may be a result of earlier negative experiences during the installation phase or with the individual products used. Additional tests have shown further positive correlations.

CONCLUSION

Scientific evaluation of the tenant surveys, including statistical significance tests and tetra choric relations of available data in the context of demographics, has provided ample evidence that tenant satisfaction does not depend solely on the way new technologies improve independence. Rather, services provided by housing organisations play a significant supplementary role.
Another evaluation step was carried out to determine which housing organisations were able to generate an especially high level of satisfaction with the service packages that they provided, and which variables might lead to a high degree of tenant satisfaction in the future.

In a first comparison between countries it became apparent that tenant satisfaction with the services of different housing organisations did not show significant variation. Only 3 out of 144 interviewees rated their housing organisation’s service as “poor” and only five tenants indicated a neutral position. Six out of seven housing organisations demonstrated degrees of tenant satisfaction of up to 90 percent. To determine which services resulted in higher tenant satisfaction, participants were asked which aspects of service they enjoyed most. The most common responses were “friendliness”, “participation”, “contact”, and “company”. These further demonstrate the importance of social variables in providing isolated tenants with a higher degree of satisfaction through personal, regular contact. Other keywords, such as “participation” and “patience”, indicate that housing organisations may need to meet special needs of groups for whom instruction might be challenging, for example because of their age or unfamiliarity with ICT. Such tenants wanted to take part in the project, and were grateful for housing organisation “patience” throughout the learning process. This conclusion is confirmed by participants’ responses when asked if they found their housing organisation’s service useful.

There were a few negative answers, as well. “Little contact” appears to reinforce the importance of frequent, high quality interactions with the housing organisation. “Installation” was also mentioned, indicating that negative experiences during the installation phase are significant. Recurring problems with internet connections were also common.

Overall, this extract represents only a small part of the whole evaluation process and results. However, it was important to present how the tenants perceived their participation in the I-stay@home project and which conclusions can be drawn for the future of this concept. A short overview in terms of potential target demographics for assistive technology will be helpful for further spreading ICT in addition to the effort that was necessary to make the project a success and to make a real difference in most participants’ lives. It is encouraging that the potential target group is quite broad with age, gender, migration background and physical disadvantages being irrelevant for making an impact in people’s lives. Among elderly tenants, it is sadly quite often the case that they live alone or with a partner and either live socially isolated or are childless. It cannot be stressed enough that significant support from housing organisations such as training sessions, consultation hours and telephone support were necessary for tenants to make proper use of technology. Furthermore, participants appreciated the friendliness and patience of housing organisations throughout the testing phase. This kind of social support would therefore be a necessary component of any future industrialisation of the I-stay@home approach. Overall, social support was a key factor for success in the project.

The whole evaluation report is available for download in English language on the I-stay@home website.
OVERALL CONCLUSIONS

In conclusion, tenants have provided some very useful insights into the challenges they face on a day to day basis and how ICT solutions can play a role in assisting their independence. Tenants indicated that they have greatest difficulties with accessing the internet, getting around (shopping in particular), and cleaning their homes. They rely principally on family and friends for support with social services and technology also playing important roles.

Tenants identified the preservation and maintenance of their independence and financial hardship as their greatest areas of concern going forward. Specifically, they are concerned about becoming disabled, developing mental health problems such as dementia and being unable to look after themselves and their homes.

Encouragingly, most tenants would be willing to adopt new technologies that would help improve and maintain their independence and certainly allow them to stay at home. However the most significant barriers to any adoption of new technologies or ICT solutions would be their affordability, popularity and usability. These barriers become less important if tenants think that solutions would be provided by housing organisations and/or they helped their families in some way.

The findings show that there is indeed a demand for ICT solutions as a mechanism of support working in conjunction with the already existing support tenants receive from family and friends and/or social services. Crucially any solution would need to help mitigate the impact of aging on tenants.

After choosing products following the above mentioned criteria and testing them with approximately 200 test participants in five countries for about one year, it became clear that tenants’ experiences with ICT products and solutions have been overwhelmingly positive. More importantly, tenants reported that the ICT products they have learned to use have had a positive impact on the areas of concern described to housing organisations in previous research. Tenants had said that their most significant concerns were about getting around, mental health, caring for themselves and their homes, and their health. Throughout the pilot, tenants have indicated that the tested ICT products have had a positive impact in all of these areas of living. They have also indicated that the products had a positive effect on their independence.

However, according to research conducted throughout this project, both tenants and housing organisations report that the biggest problem with ICT is that it is still too expensive for elderly and disabled people with low income. Housing organisations also have a secondary concern in installing ICT that they could then bear responsibility for its maintenance. Finally, many housing organisations ask where the limit to what services they provide lies. Do they offer environmental control products? Self-monitoring health products? Emergency service products? The answers to these questions vary between countries and individual organisations.

Looking past these issues, the products themselves are beneficial to tenants. But it is important to stress that they are only supplementary; they cannot replace human support.

The project also revealed the importance of tenants learning to use ICT. An organisation will not be able to simply purchase these products and give them to tenants; extra resources must be allocated towards teaching a tenant how to use them. This instruction could come from the housing organisation itself, but would preferably be done in partnership with social services, family, or friends. The I-stay@home products improve the quality of life of the tenants, giving them valuable tools to remain autonomous, but do not replace the use of other services. Their added value is in improving the efficiency and accessibility of other services, not in replacing services completely.

I-stay@home has demonstrated that as a result of the ageing population, social housing organisations will need to propose services to tenants that make it more attractive for them to continue living in their own homes since the potential target group is quite broad with age, gender, migration background and physical disadvantages having no effect on ICT’s impact on people’s lives. Thus, housing organisations should be able to offer options to tenants to make their homes more comfortable and to provide better access to external services that could be brought into their home via ICT. Homes now have not only to be accessible, but must also adapt to the ever-growing ICT solutions available in the market today as this is a suitable way to help the ageing population to stay in their own homes longer than before.
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