Sensors systems have been largely developed to support the independent life of elderly people in their home and reduce the need of moving in nursery homes. A new research trend has recently emerged in which domestic sensors systems are being designed to detect meaningful deviations from normal life patterns of the home inhabitants, in order to infer any tendency towards an unhealthy status in the near future and suggest preventive actions. This prevention-driven application of a sensor system shifts the design focus from elderly users who experienced ageing watershed events, and already recognize the need to be taken care of, to capable seniors who wish to keep doing their life and favorite activities as they age.

The EU funded Helicopter project deals exactly with the monitoring of independent elderly behaviours for unhealthy routines and illnesses prevention. At the very beginning of the project, CIID researchers conducted a fieldwork and met active seniors in their context of ageing. Through contextual observation and interview sessions, insights have been collected and several opportunity areas for design have been discovered around the meaningfulness of a sensors system from the perspective of elderly people who are still autonomous and in good health.

This publication aims at describing the whole journey CIID researchers undertook during the initial research phase of the Helicopter project and describes the fieldwork in terms of his structure/organization, qualitative data collected and following analysis, up to the set up of the concept generation phase.

PEOPLE CENTRED RESEARCH by Laura Boffi

CIID COPENHAGEN INSTITUTE OF INTERACTION DESIGN

HELICOPTER

PEOPLE CENTRED RESEARCH

Project deliverable D2.1

by Laura Boffi

CIID COPENHAGEN INSTITUTE OF INTERACTION DESIGN

HELICOPTER

Deliverable 2.1

PEOPLE CENTRED RESEARCH

By Laura Boffi, CIID Research

CIID COPENHAGEN INSTITUTE OF INTERACTION DESIGN

HELICOPTER
Healthy Life support through Comprehensive Tracking of Individual and Environmental Behaviors

This Book ensued from the Research Project Helicopter /Grant agreement AAL-2012-5-150/ Project Officer: Marco Carulli.

EUROPEAN COMMISSION
European Research Area

HELICOPTER CONSORTIUM

Me.te.da (Coordinator), Italy
Copenhagen Institute of Interaction Design, Denmark
University of Parma, Italy
Vision System, Romania
University of Skövde , Sweden
Laboratorio delle Idee, Italy
Municipality of Skövde , Sweden
International Business School, Jönköping University, Sweden
Slimmer Leven 2020, Netherlands.
http://www.helicopter-aal.eu/

Table of contents

Acknowledgements

This study could not be realised without the collaboration of the Helicopter partners Municipality of Skövde and Slimmer Leven 2020. They took care of recruiting the participants in Sweden and the Netherlands and motivated them in joining the project. We thank in particular Carina Berg and Ilse Schoormans for their effort in coordination and translation.

The preparation of the study and its actual deployment was done by CIID researchers, in particular: Laura Boffi, Dionísio Soares Paiva, Caroline Arvidsson, Jamie Allen and Jakob Bak. A special thanks goes to Dionísio and Caroline who developed and coded the prototypes they took in Sweden during the Experience Prototyping session.

CIID communication designer Catherine Descure took care of designing this document. Her work was essential to support the unfolding of our story and make it as a pleasant book to hold and read.

Our main thanks goes of course to the seniors we met, who were willing to open their homes to us and tell us about their life. The whole research is in debt with them for the time they spent with us, but especially for the trust they keep in us as researchers. Their motivation and the trust they have in the project is an encouragement for all the consortium.

With contribution of: Laura Boffi, Dionísio Soares Paiva, Simona Maschi, Alie Rose, Catherine Descure.

Laura Boffi, Senior Researcher,

Copenhagen Institute of Interaction Design

Preface

We explicitly name our fieldwork “People Centred Research”, versus “User Centred”, because we believe in a holistic approach towards the project space we are exploring. Shifting the focus from users to people helps researchers be more receptive regarding the context they are investigating. This enables the researcher to overcome any innate frame of mind linked to user profiling and to have an acute sensitivity to receive people’s stories and meaning.

The key message is that “User” centred research focuses on an individual in the moment of using/interacting with a specific product/service/environment. In this context the research interest lies in the person in the moment of consumption. With a “People” centred approach we are interested in the way people live their lives and how they interact with their surroundings, not only in the moment they consume or interact with a particular product or service.

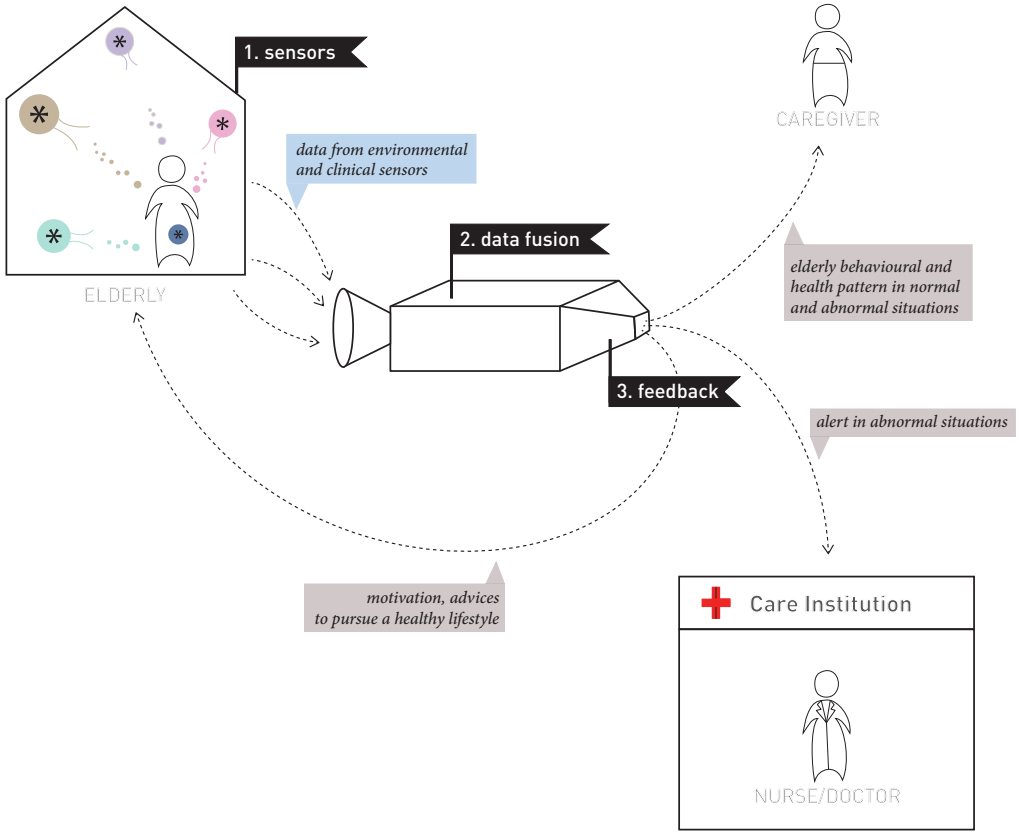
Being “People Centred” involves reorienting ourselves in the project space, embracing a bigger picture as a research framework and digging deeply into people’s lives. Researching with this mindset allows researchers to resonate with the people they meet in the field and reach a greater empathy with them. We believe that this is key to the start of any innovation project because it is through the researchers’ sensitivity that meaningful insights can be collected from the field and informed creativity be unlocked.

When we keep focusing on the user we will probably end up creating an incremental change to the status quo. The People Centred approach allows for more radical/disruptive innovation to happen as it opens up for more innovation opportunities.

I.

CONTEXT

Design Research for Ambient Assisted Living



Helicopter project diagram.

About the Helicopter project

The Helicopter project aims at supporting older adults towards a healthy and independent life through a domestic network of environmental, wearable and clinical sensors. Thanks to the environmental sensors, which for example sense if a person is moving in a room or if laying on his bed, the Helicopter project is able to monitor elderly daily life behaviours, thus detecting if any abnormal pattern emerges. At the same time, the elderly is prompted for regular checking on his health parameters, for example weighing himself or measuring his glycemia. Through the fusion of the collected information from the environmental and clinical sensors, the Helicopter system is able to infer the possibility of unhealthy patterns emersion and diseases onset.

The idea behind the project is to provide end-users and their caregivers with feedbacks, advices, and motivations for pursuing a healthy lifestyle by monitoring and analysing the elderly daily life behaviours, as well as medical status, in an unobtrusive and simple way.

The Helicopter system will also communicate to the elderly's nurse/GP or care institution in order for the medical specialists to take action proactively and check more deeply on the elderly status may some alert arise about any abnormal behaviour and clinical parameter that the sensors have tracked.

CIID's role in Helicopter

CIID's main role in the Helicopter project has been to lead a people-centred design process to learn from potential Helicopter users how to make the sensors system meaningful for the elderly health and well-being monitoring.

By applying the design research methodology, CIID has been in charge of the fieldwork with end-users and of the concept generation for new services based on the sensors system and data fusion infrastructure (Work Package 2). Fieldwork was conducted with elderly participants in Sweden and the Netherlands in late 2013 and insights were synthesized to inform the following concept generation phase.

A deep focus has been put on making consortium partners engaged in all stages of CIID user studies and concept generation, thus allowing that the transfer of learnings from the field would result in the emergence of an empathetic connection among the different consortium researchers and the end- users, and not only among the design researchers who were visiting and interacting with the elderly participants in first person. Workshops with the consortium were organised in order to instill the experience of the fieldwork and communicate the key findings. For that purpose, different media material from the research (such as pictures and videos) were edited to be shown and handled to partners.

A CIID visit at the house of a participant in the Netherlands.

The meaningfulness of a sensor system

At the beginning of the project, CIID introduced "the meaningfulness of a sensor system" concept to relate to the elderly own awareness and perceptions of the sensors distributed in their living environment (Boffi & Arvidsson, 2014).

Thus, the meaningfulness of a sensor system is not related to the relevance of data that the sensors are capturing, which is intrinsic to the Helicopter project. Instead it deals with the integration of the sensors in the domestic landscape of the elderly household, in terms of:

- The physical presence of the sensors (where they are placed, which material they are made from, which shape they have);
- Their behaviour as perceived by the inhabitants who interact with them in a passive or active way (how the sensors themselves perform their sensing capabilities when they switch on, move, sense, etc.);
- Their sensing capabilities (as pictured by the single inhabitants in their mental model of them).

The initial fieldwork was in particular meant to research on this idea of the meaningfulness of a sensor system in the eyes of the elderly. Informed by the findings gained during the first research phase, CIID went on a following research trip in early 2014. Bringing research tools and new sensors system prototypes with them, CIID researchers performed several Experience Prototyping sessions with the elderly participants (Buchenau & Fulton Suri, 2000) and probed how the integration of a novel Helicopter-inspired monitoring system would be perceived by the users.

Work Package 2

Work package 2 (WP2) has as its main objective the discovery of the individual user context, in-situ and in the everyday practices of the lives of prospective users. The work package tasks derive early context studies towards establishing ties to specific elderly user groups and individuals, followed by the design of physical provocations and speculative prototypes (i.e. "design prompts"), which serve to evoke design insights that inform and shape final designs of services, objects and systems. Tasks are also included that will serve to outline the existing design space of data-driven designs for elderly assistance, in order to push beyond the state of the art of concepts in interaction and technology design with personal data (e.g.: "Quantified Self" and related applications).

The tasks are summarised as follows:

- T2.1 Initial User and Context Studies
- T2.2 Developing prompts and Interaction Design Strategies
- T2.3 Design for Meaningful Awareness of Data
- T2.4 User Interactions & Design Concepts
- T2.5 Learning and Behaviour Strategies
- T2.6 Target User Group Profiling

CIID is mainly involved in the tasks from T2.1 to T2.4 as they cover the people centred research, the concept generation and the early prototyping with the elderly participants.

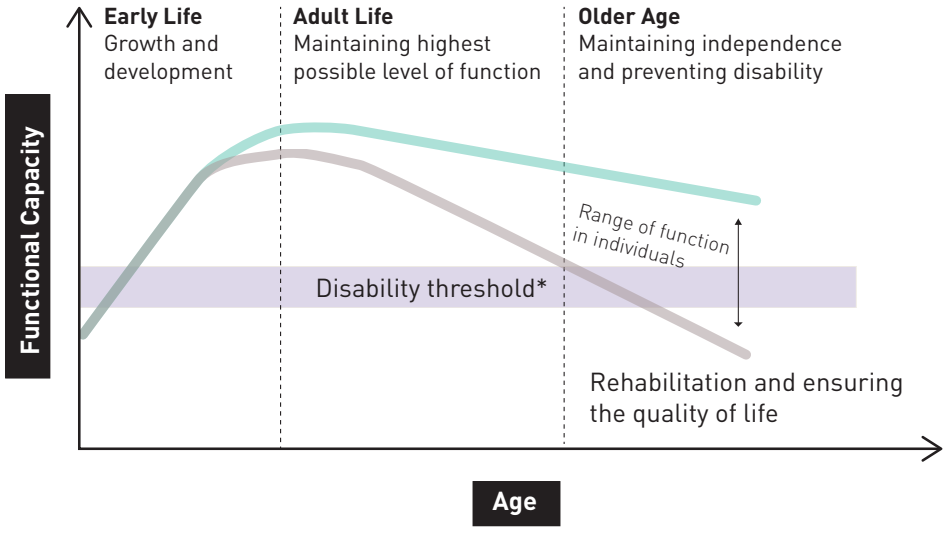
II.

THE STUDY

Learning from people how to make a sensor network to monitor well-being and be meaningful for the elderly health

PHASE 1:

FIELDWORK WITH PARTICIPANTS



Img 1.
Schematic about functional capacity and age — Source: Kalache and Kickbusch, 1997.

Who we met

At the end of 2013, fieldwork with participants was organised in the city of Skövde, Sweden, and Eindhoven, Netherlands. Elderly participants were recruited respectively by the project partners Municipality of Skövde and Slimmer Leven 2020 based on their age, their health condition and their context of living.

As the Helicopter project is aiming at delivering a motivational and disease prevention support to older adults, we decided to recruit functional elderly who were in a relatively good health condition for their age and did not experience any ageing watershed event which would have projected them below the disability threshold (img. 1) (Kalache & Kickbusch, 1997).

Being the ageing process highly dynamic and specific for any individual living in a particular context (Mitnitski et al., 2002), we decided to recruit seniors over 65 years old, without establishing any age limit in order not to restrict our design intervention based exclusively on users' chronological age (Subasi & Malmborg, 2013; Brandt, Binder et al., 2010),

As regards the health condition, participants were selected who were not suffering from major chronic diseases or severe disabilities, yet possibly being affected by (or being at risk of) metabolic or circulatory malfunctioning which are endemic for this class age (e.g. hypertension, mild diabetes) or by mild cognitive deficits.

Concerning the context of living, it was a requirement to recruit elderly people who were living independently in their own home, without any formal or informal caregiver inhabiting with them.

A total of 12 participants were selected in Sweden and in the Netherlands, among which 5 were ladies and 7 gentlemen. Only 2 of them were a couple living together.

SWEDEN


Gunnar, 85


Seija, 69


Ilse, 70,
and Bengt, 77


Leila, 73


Olle, 73

NETHERLANDS


Mrs Elstak, 93


Mrs Willems
and Mr Cuypers


Mr Zevenbergen,
98


Mr Domstorff


Mr Schoffelmeer

The visits

CIID researchers travelled to Sweden and the Netherlands at the end of 2013 to meet the recruited elderly participants. Participants were asked to host the research visit at their home, in order to let the researchers dive into their own context of daily living, although for a limited period of time. Visits were estimated to last about 2 hours, but the real duration was every time left to each participant's content, either to end it earlier or to extend it.

In each visit, CIID researchers were paired with the responsible person of the local user group, managed respectively by the project partners Municipality of Skövde, Sweden, and Slimmer Leven 2020, Netherlands. Being accompanied by a local person, who already knew the participants, favoured the relationship building with the newly- met researchers and helped with the translations in case the interviewed people were not comfortable in English.

The research visit consisted in a conversation with the elderly participants based on a semi- structured interview plot which researchers had prepared in advance. The visit would end with a tour of the house guided by the participant in order to get a better feeling of their domestic "ageing" landscape.

The semi-structured interview

UNFOLDING A CONVERSATION PLOT WITH THE ELDERLY PARTICIPANTS

The semi-structured interview provides a conversation plot to tackle all the different topics the researchers were interested in with the participants. The idea of bringing such a plot on the field was not to follow its structure strictly, but to support the researchers in the natural unfolding of a conversation around topics which were relevant for the project.

The interview was organised into 9 different areas, the last of which was the tour of the house.

1) GETTING TO KNOW THE PERSON

- Would you like to introduce yourself to me?
- How old are you?
- Do you have any children?
- How long have you been living in this house?
- With whom do you live?
- Do your children live near you?
- Do you usually spend your time at home? Or how?

2) A DAY IN THE LIFE

- How do you spend your time in a day? Please describe a day in your life to me, like yesterday for example.
- How do you decide to spend your time and organise your day?
- Which are the moments in the day that you enjoy the most? Why?
- And the ones that you dislike? Why?
- How do you think is like living in this house alone (or with your partner)?
- Are there any occasions in the day where you feel unsafe or insecure at home? Why?
- On what do you think it depends? Does it depend on your health conditions, on the fact that you live alone, or...?
- Can you remember an occasion you would have liked to have your family or close friends with you at home? Why?
- What do you usually do when you don't feel safe, if you are at home? Why?
- How do you contact someone if you need help today? Could you please show us the process? Is there anything in that process that you would like to change?

3) HEALTH CONDITION AND DAILY LIFE

- How do you think is your health? Do you suffer from any disease? Like high blood pressure, diabetes?
- Do you use any walking aids? How often?
- How do you keep under control your health? Are you under pills?
- How do you remember to take all your pills? Did you make anybody responsible to help you with reminders?
- Do you meet any doctor or nurse from time to time? Does it happen that you phone them?
- How do you know/acknowledge that you would better call your doctor? Can you perceive when you are not in good health? Do you have any "body alarm"?
- Can you manage your "body alarms" on time?
- What about your family: how and when do you let them know that you are not good?
- What's your first thought when you don't feel good?
- What do you usually have /suffer from when you don't feel good? Can you recognise it by yourself or do you need to call anybody (a doctor)?
- How does your day change when you are not feeling good? What do you usually do in your "bad" days?

4) YOUR HOME

- Is there a particular room(s) where you like to spend your time in? Why?
- Is there a place in the house where you don't feel confident to be alone? Why?
- Was it always like that, or is it a feeling you developed over time? Do you have an idea why?
- Is there a place in the house that you think is dangerous for you? Why?
- Where do you like to rest when you do not feel good?

5) YOUR FAMILY

- What do you think about not having your kids living with you? Which are the advantages of living alone for you? Which are the disadvantages?
- Is anybody in your family taking care of you?
- Is it important to you that your friends know how you are doing daily? Why?
- How do they look after you, even if not being always here with you?
- Is there any time you feel a little left alone by your family? Why?
- Would you like to receive more phone calls by anybody of your family? Why?
- Do you think your family worries about you living alone? How can you understand it?
- Do you think they worry too much for no reasons or that instead they should? Why?
- Do you think that there could be a way for you and your family to be more connected and reduce the stress of being isolated/distant?
- How do you reassure your family about your health status?

6) YOUR FRIENDS / NEIGHBOURHOODS

- Can you describe me the neighbourhood where you live?
- Do you have friends from the neighbourhood or do you know people only by sight?
- How do you get to know new people? Is that easy for you?
- How often do you meet your friends?
- And, do you call them often by phone?
- Where do you usually meet (depending on the seasons...)?
- Are you aware if your friends are feeling well or not?
- And them, are they aware if you are feeling well or not? How do they get to know you are not feeling so well?
- Is it important to you that your friends know how you are doing daily? Why?
- Do you go out in the neighbourhood each day? To do what?
- What about the shopping? Do you do it in the nearby shops?
- What do you usually do when you go out in the neighbourhood?

7) YOUR DOCTORS

- What do you think about not having your kids living with you?
- How do you communicate with your doctor/nurse? How often?
- Do you feel it is enough for having your health monitored?
- Do you feel he/she is always accessible for you?
- Did it ever happen that you were scared not being able to call your doctor/family caregiver? Why?
- Are you also scared for the future?
- If the doctor/nurse would have more time to dedicate to you, what would you like to tell him/her? How often?
- Is there a moment in the day you would like to call your doctor, but than you retain from doing it? Why?
- What do you do, instead, to keep calm?
- Does it happen that you have doubts taking your pills? When? How do you handle it?

8) KEEPING MOTIVATED WHILE AGEING

- What is quality of life to you?
- What keeps you motivated to improve your life quality and your health?
- How do you keep a happy and motivated person towards life?
- Do you receive encouragements/ inputs from others to improve your daily life? Can you give me an example?
- How do your family keep you motivated in doing your daily activities?
- Which role do your friends play in your daily life motivation?
- Are you part of an elderly/seniors group? What do you usually do together?
- Does your doctor/nurse give you suggestions in improving your quality of life or health? How? When?
- Imagine that you could receive inputs to keep motivate in your daily life and encouragements to improve your quality of life: which kind of inputs would be beneficial to you? Why?
- Would you feel comfortable knowing that a doctor or a social care worker was always looking after you from a distance? (Bertil) Why?
- Would you like to receive more phone calls by anybody of your family? Why?
- Do you think your family worries about you living alone? How can you understand it?
- Do you think they worry too much for no reasons or that instead they have to? Why?
- Do you think that there could be a way for you and your family to be more connected and reduce the stress of being isolated/distant?
- How do you reassure your family about your health status?
- Which role do your friends play in your daily life motivation?
- Are you part of an elderly/seniors group? What do you usually do together?
- Does your doctor/nurse give you suggestions in improving your quality of life or health? How? When?
- Imagine that you could receive inputs to keep motivated in your daily life and encouragements to improve your quality of life: which kind of inputs would be beneficial to you? Why?
- Would you feel comfortable knowing that a doctor or a social care worker was always looking after you from a distance?

9) TOUR OF THE HOUSE

Asking the participant to guide the researchers in a tour of the house. This activity is aimed at mapping the domestic "ageing" landscape by retracing habits, behaviours, confidence and worries in the different spaces of the house.

A scene from the fieldwork with participants guiding the researchers and translator in their home.

The participant describing her family photo frame to the researchers during the tour of the house.

CIID's Documenting methods

NOTES

During a fieldwork session, the researcher who is interviewing focuses on the conversation with his participant and usually writes his notes on a notebook to save both interesting quotes and first impressions about the discussion, the participant and the context he is immersed into. Back from the fieldwork, the notes will turn particularly valuable while going through the recorded footages because the researcher will be able to retrieve his genuine thoughts and feeling of the session as it happened.

VIDEO

At the beginning of each visit, researchers ask the participant for permission to video record the interview. Videos are very useful when researchers get to the analysis phase and want to look back not only at the content of the conversation, but also at the expressions of the participant and the context of the interview. From the videos it is also possible to extract screenshots that better describe the participants feelings and reactions to particular topics of the conversation.

PHOTOGRAPHY

As for the videos, permission is also asked at the beginning of the session to take photos of the people and the spaces. Photography allows the researchers to capture the environment surrounding the interview setting which would not be included in the videos. Moreover it allows the researchers to quickly capture scenes or objects as the participant guides them through the tour of the house.

VISITS IN SKÖVDE (SWEDEN)

// Profiles

The Swedish participants were spread across the city centre and the countryside. All of them were living in their own house, without any caregiver cohabiting with them.

Skövde Elderly Centre: the main hall.

Gunnar, 85, Skövde (Sweden)

IN A FEW WORDS

Gunnar lives by himself in his apartment since his wife passed a couple of years ago. The way he usually spends the day is regulated by the weather outside and the way he feels. According to that, he may decide to visit his wife graveyard or to go grocery shopping. He is really keen on keeping his interests and passions in his late life, such as reading, going to the opera and theatre. As he ages, he is particularly afraid of being hit by a stroke because he may forget everything about himself and "*[...] suddenly the entire life will be gone.*", as he refers.

WHAT WE OBSERVED

Being in his house really transmits the activity he is busy with during his daily life. The table in the living room is covered with pictures and papers which he collects for his illustrated biography. He also uses a numbered of digital devices (smart phone, tablet, laptop) for his personal entertainment and researches.

" For my health and wellbeing it is both important to be cognitive and physically active. I do physical exercise on the wooden bar on a daily basis, expect for when I don't feel good."

" I look after myself keeping engaged with my memoirs. I research on books and on Google. This also helped me a lot for my wife's death sorrow."

Gunnar at the exercise bar in his bedroom.

An old family picture Gunnar collected for his memoirs.

Seija, 69, Skövde (Sweden)

IN A FEW WORDS

Seija lives by herself in the city countryside, while her daughter and grandsons live in Stockholm. She has a very close friend, Arne, who lives next to her and they usually see each other during the day. She has been living all her life independently, but now that the onset of age related illnesses become a threatening possibility, she starts feeling negative about it and thinks that cohabiting with another person would provide the benefit of taking care of each other.

WHAT WE OBSERVED

She was confident about a domestic sensors monitoring system because it could give her some peace of mind and could be economically efficient. Anyway, she stated clearly that the human contact behind the system should always play a major role.

She always carries her mobile phone with her. It is a way for her to keep connected with her family and friends and it could help in emergency situations, even if she believes it would not be the ultimate solution for that.

" The young generation is now discovering that Facebook is not enough. What will it be for elderly people if they just get virtual? "

" Even when I get ill, I try to do as much as I can, following my daily routine between voluntary work and physical training."

Olle, 73, Skövde (Sweden)

IN A FEW WORDS

Olle lives with his wife in a residential area of the city. He is very engaged with an elderly organisation for retired people and by attending it he has gained a deep understanding of elderly people' s daily concerns. He is committed to support the older neighbours in keeping an independent lifestyle. For this reason, he tries to check on them in unintrusive and pleasant ways, such as bringing them the post, visiting to read the newspaper together or just exchange a few words when they meet.

WHAT WE OBSERVED

Olle is very positive about a sensor system monitoring for his health and wellbeing, but his wife is completely against it, thus creating domestic tension about his participation in the Helicopter project.

" As seniors living in the same neighbourhood, we need to take care of each other and help each other in the daily routines and needs."

" The elderly often suffer from mental illnesses that they cannot communicate to others. For this reason they do not receive any advice from the doctor... They need to act as the doctor of themselves..."

Leila, 73, Skövde (Sweden)

IN A FEW WORDS

Leila lives by herself in a residential area of the city. During her life, besides her regular employee job she has been an amateur actress. After retiring, she has joined the Senior Society of her district, where together with other senior colleagues she contributes on the local management of elderly related issues. By attending the Society, she got a deep understanding of how the elderly group has an heterogeneous range of needs depending on the age.

WHAT WE OBSERVED

She is implementing her own strategy to keep living at home as long as possible. It consists of renovating her house so that it would be comfortable to live in it later in life. For example, she has lifted the oven and she is removing all the little steps between the corridor and the rooms facing it.

“ I need to have control over my illnesses so that I can keep living independently at home.”

Pictures from Leila’s theatre plays.

A step between the corridor and the living room, which will be eliminated during the house renovation.

Ilse, 70, and Bengt, 77, Skövde (Sweden)

IN A FEW WORDS

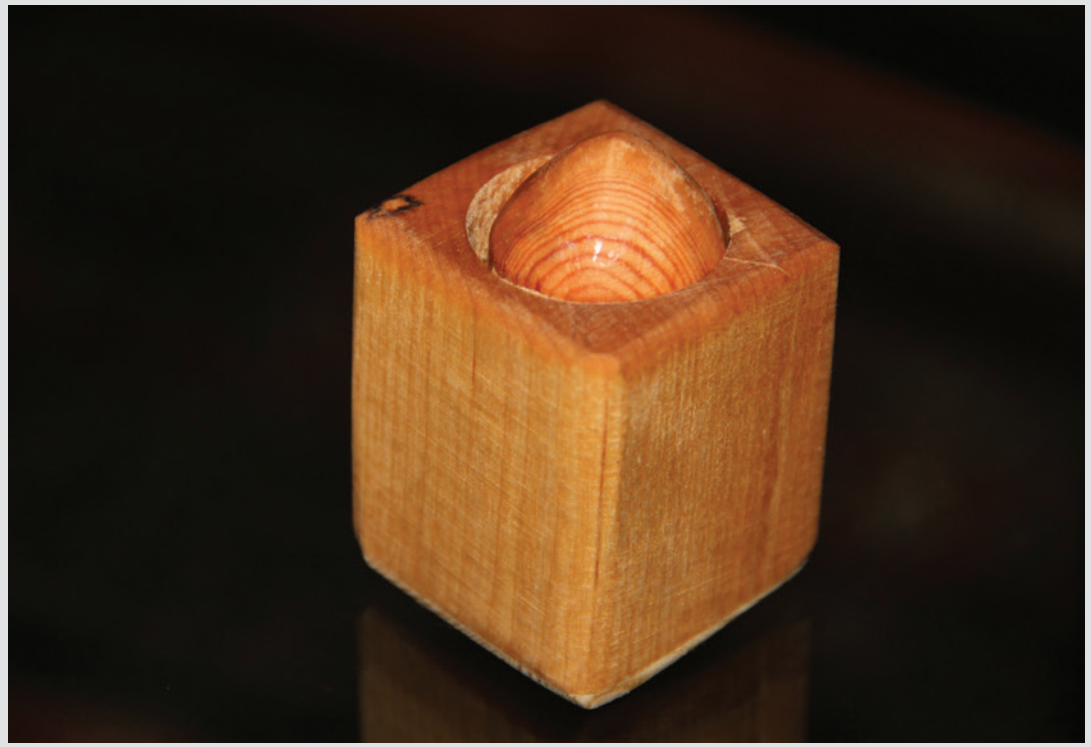
Ilse and Bengt are a very active couple. They do not share the same daily routine and each of them spends the time in the own interests and hobbies, while they meet for the meals and to play cards. They both think that staying active (mentally and physically) is key to keep healthy. In the future they would like to keep living in their house, so they built it in a way that it would be accessible with a wheelchair. They know their neighbours and use to check on them to see if everything is fine.

WHAT WE OBSERVED

Bengt loves to build stuff from wood in his workshop. During the day he also likes to get continuously updated with the news. Ilse focuses on keeping an active lifestyle and she achieves that by getting engaged in different kind of activities: from baby sitting her grandsons to part-time working as a company accountant.

" We can see only advantages in living alone. It is fantastic! You need to have your own life independent from children!"

" As you age, you have to keep active and engaged in the things you like. That's the secret to age well."



A craftwork by Bengt.

VISITS IN EINDHOVEN (NETHERLANDS)

// Profiles

The Dutch participants were living in Vitalis Kortonjo apartments inside the Genneper Park. The condominium inhabitants are above 55 years old and can benefit from different services offered, such as the restaurant, social entertainment, professional care and medical checks, according to their own preferences and needs. Each house is provided with an alarm station, which enables the nurse and the inhabitant to talk to each other in case of emergency. The inhabitants are also provided with a wearable alarm, which work within the condominium walls.

The view from a Kortonjo apartment to the Genneper Park and to the second Kortonjo condominium we visited.

Mrs Elstak, 93, Eindhoven (Netherlands)

IN A FEW WORDS

Mrs Elstak just moved into her new apartment in Kortonjo condominium 6 months ago and this made her feel safer. She got a heart attack 3 years ago. She couldn't move and managed to push her wearable alarm by biting it with her teeth. In this way, she could contact her sons. She makes use of the services offered by the condominium only if she can't do things herself. For example, twice a week she gets a help from the nurses to take a shower.

WHAT WE OBSERVED

When she gets up, she needs to push the "wake- up button" on the alarm system: this will be interpreted by the Kortonjo carers that she is okay and the night went well. If she forgets to do it by 10.30, a voice comes out from the alarm system. She doesn't really know what it says, if it is an actual nurse speaking to her or if it is the automatic voice of the system. When this happens, she knows that she just needs to push the "wake-up button" she forgot to push early in the morning.

Everyday she does some light exercise for her arms with particular rubber bands she hangs on her wardrobe.

"At 93 you can't know what can happen to you..."

"It is important for me to be able to call the alarm before something serious happens."

Mrs Elstak explaining to the researcher the "wake-up button" on the alarm system.

Mrs Elstak showing how she performs her daily exercises.

Mrs Willems and Mr Cuypers, Eindhoven (Netherlands)

IN A FEW WORDS

Mrs Willems and Mr Cuypers are close friends living in two different apartments in the Kortonjo condominium. Mrs Willems moved in there 3 years ago, because it was not possible anymore for her 90 years old husband to leave in the old house (too many staircases). Moreover they felt more secure in the condominium in case something would happen.

WHAT WE OBSERVED

As all the inhabitants in Kortonjo, they have been provided with a wearable alarm. Mrs Willems usually wears it on her bra and put it on a low shelf when she is having a shower because she is not sure if it is waterproof. Mr Cuypers instead is used to when her wife was living with him and they were taking care of each other. Now that she passed, he keeps the alarm on his bedside table during the night in case of heart problems. For the rest of the time, he forgets to wear it.

" If I had to imagine somebody motivating me for my health and wellbeing, this could be a kind of waiter, or event a pet or an unknown visitor...It could also be a postman delivering me happy suggestions for my life."

> To Mrs Willems it is very important that the alarm is activated by her pressing the button. It is a way to participate to the monitoring.

Mrs Willems showing her wearable alarm in front of the alarm system.

Mrs Willems showing where she hangs her wearable alarm in the bathroom.

Mr Zevenbergen,98, Eindhoven (Netherlands)

IN A FEW WORDS

Living in his condominium apartment makes him feel secure after he got 2 strokes recently. He has 2 sons and grandchildren. He also made new friends in the condominium and they meet for tea or lunch. He has a pretty organised weekly schedule and he tries to spend much time outside the condominium to keep what he refers to as "the normal life".

WHAT WE OBSERVED

Every morning he pushes the alarm system button to communicate to the nurse and say that the night went fine. He never spends time on the balcony: he thinks he is an insecure place to be, even wearing the alarm. He tries to get engaged in different activities, from cultural ones to sports. He uses the computer and the internet especially for e-mails, checking the railways status and the news.

"Since I moved here, it is important for me to keep the same habits I had before, in my previous life, like meeting the same friends, doing the same things. Social and normal life happens outside of here."

"I do not need to get external motivation to keep an active and healthy life. My grandchildren set the goals for me!"

Mr Zevenbergen showing where he hangs his wearable alarm when he takes a shower.

His computer desk.

Mr Domstorff, Eindhoven (Netherlands)

IN A FEW WORDS

He moved in his apartment since 2007, when his relatives asked him to come and live near them. He has a sister in the city who has some health problems. He goes to meet her twice a week and phones regularly to see how she feels. He likes to receive suggestions from his girlfriend on how to improve his life. She was the one suggesting to buy a walker.

WHAT WE OBSERVED

His girlfriend lives in Switzerland and they meet during the holidays. They have their own way to look after each other from a distance: they both have a map of each other's city and they have highlighted the routes they usually go for a walk. When one of them goes out for a walk, he/she phones and informs the other one about the route, so that he/she can follow the partner on the map. Every two hours they phone each other to say which place they have reached at that moment and ensure that everything is fine.

"I would like my wearable alarm to work also outside and to set the areas I would like to be monitored through it."

"From a distance, I follow my girlfriend when she goes for a mountain walk through the map. Every two hours she phones me to say where she actually is."

Mr Domstorff showing his new walker

The highlighted routes of his girlfriend walks.

Mr Schoffelmeer, Eindhoven (Netherlands)

IN A FEW WORDS

He has been living in his apartment for 5 years. He moved there when his wife was still alive because they were "getting old". Some friends suggested them to keep living in the same house and hire a nurse permanently, but they didn't like that solution and opted to get easier access to healthcare by renting an apartment in the Kortonjo condominium.

WHAT WE OBSERVED

During the day he receives many visits by nurses and cleaners. They help him with the medicines , the hygiene and the preparation of food. He gets worried if the nurse doesn't come at the expected time. His son recently convinced him to have a lady helping also for the dinner.

"As long as I am in the apartment I feel secure. For the outside I use the mobile phone."

"It is important to be connected with my sons. They also need to be assured that I am all right."

"I like to have people coming in during the day. It breaks my time."

Mr Schoffelmeer taped his door remote on a ruler because he didn't find it comfortable to hold it in his hand and push the button.

The door remote taped on the intercom in his bedroom.

PHASE 2:

EXPERIENCE PROTOTYPING

Cultural probes and Experience Prototyping with participants

Who, where, when

During the summer of 2014, CIID researchers came back to Sweden to investigate further around the insights gathered during the fieldwork with a group of three participants who particularly inspired such findings with their stories. The researchers brought some cultural probes (Gaver, Boucher et al., 2004) and early prototypes of sensors systems with them in order to engage with the elderly in a one week investigation and Experience Prototyping (Buchenau & Fulton Suri, 2000).

THE SWEDISH PARTICIPANTS

Gunnar, 85

Olle, 73

Seija, 69

The research tools we designed

For this part of the study CIID researchers designed and built both paper tools as cultural probes and early sensors system prototypes. A few particular sensors were already available in the market, so they were bought by the researchers prior to their visits to the participants.

PAPER TOOLS AS CULTURAL PROBES

The following tools were left to the participants over a week for them to compile.

- **Map of the Home:** participants were asked to correct the map so to resemble their house shape. They had also to map their activities in the spaces and tell for which activities they would be comfortable or not to be monitored by a sensors system.
- **Map of the city:** participants were asked to map their outdoor activities and mark positive or negative feelings linked to each place they interact with during the day.
- **Diary:** participants were asked to fill in a daily activity diary over a week. They had also to note which activities they would like to share and with whom.

At the end of the week, the researchers came back to the participants to discuss the material produced and collect feedback. They used the following tools to engage further the participants in the discussion.

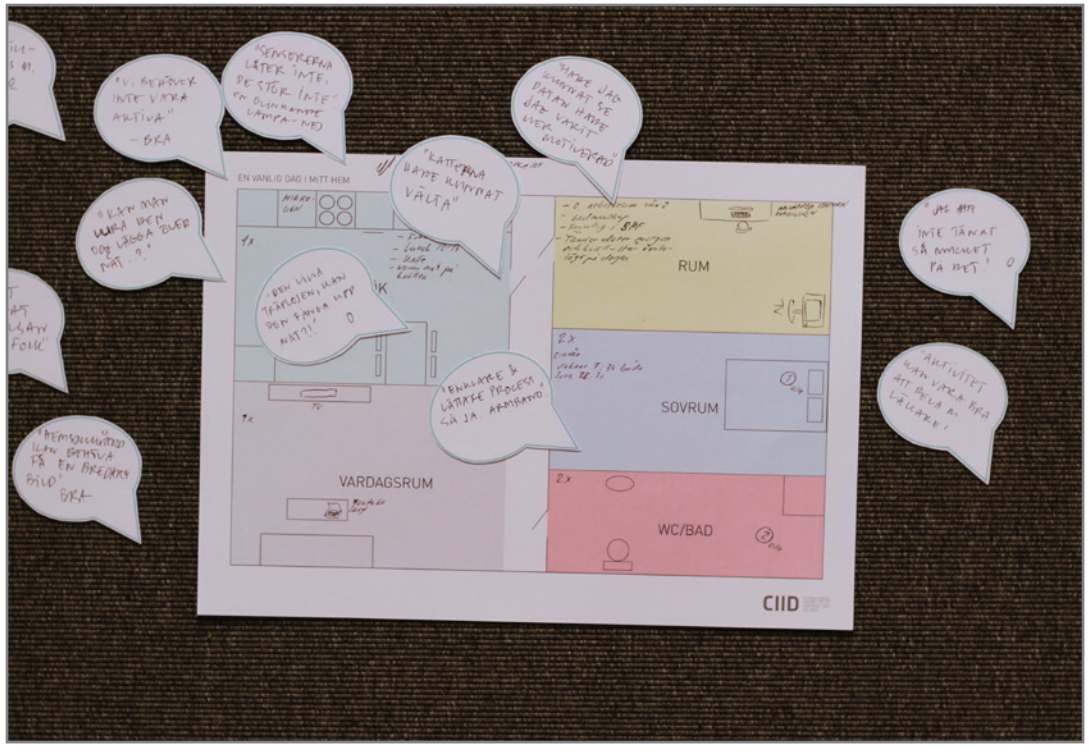
- **Personal Network of Care:** participants were asked to map their formal/ informal caregivers, friends and neighbours with whom they share their daily activities and/or look out for them.
- **Sharing vouchers:** while looking through their compiled maps and diaries, participants were asked to reflect about with whom they would be comfortable to share their activities and by which media (phone, SMS, e-mail, etc.).

Following page, top left
The Map of the Home with quote bubbles

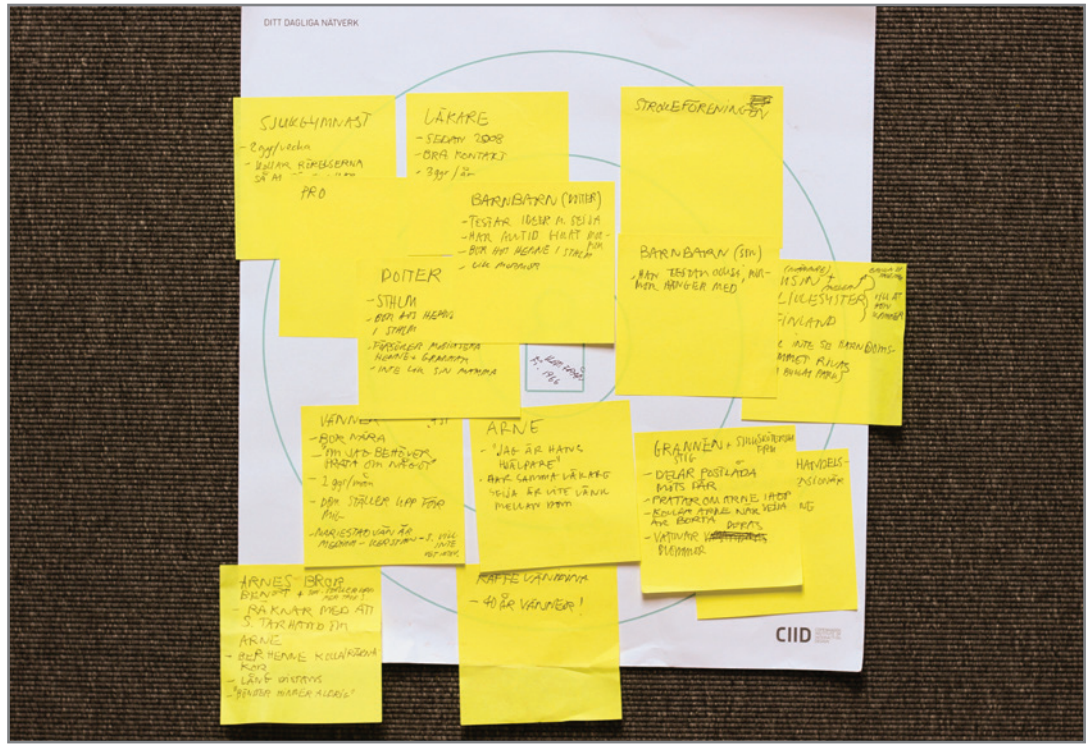
Following page, bottom left
The Diary.

Following page, top right
The Personal Network

Following page, bottom right
The Sharing vouchers.


EN VANLIG DAG I MITT HEM
RUM
SOVRUM
VARDAGSRUM
WC/BAD
CIID


LOGGBOK ÖVER AKTIVITETER
Vad var det för en aktivitet
FLYTTPACKNING
När utfördes den: dag, tidspunkt, efter / innan vad
LÖ 16/8 KL 8.00-12.00 MED SKÅ PAUSER
Hur hade du det innan / under tiden / efter
FULL AV ENERGI / LITE JOBBIGT / TILLFREDSSTÄLLANDE
Vad hade kunnat hindra dig
T. EX. RYGGSKOTT
Vad vill du berätta för din läkare om aktiviteten
LÄKARNA HINNER INTE LYSSNA.
Hur vill du berätta om denna aktivitet för din läkare
—


DITT DAGLIGA NÄTVERK
SJUKGYMNAST
LÄKARE
STROKEFÖRENINGEN
BARNBARN (DOTTER)
DOTTER
BARNBARN (SON)
VÄNNER
ARNE
GRANNEN
ARNES BRÖDER
CIID


Till: 45 43 68 Hej, Jag är vaken.
Vaken!
TRAPPA NER PÅ ANSVAR
Till: abc@gmail.com
Från: def@gmail.com
Idag har jag...
"DÅ MÅSTE DET VARA LÄTT"
Har handlat mat idag...
BRITT-MARIE RINGER KVÄLL
Hej!

SENSORS SYSTEM PROTOTYPES

The following sensors system prototypes were installed in the participants' houses over one week period.

- **Helicopter System Centre:** We told participants that this "house" was the place where all the information from the distributed sensors network would be gathered and sent to us. It could be put anywhere as long as it was connected to the power socket. In reality, it only had the data gathering function when associated with the "Helicopter Room Sensor". Built at CIID.

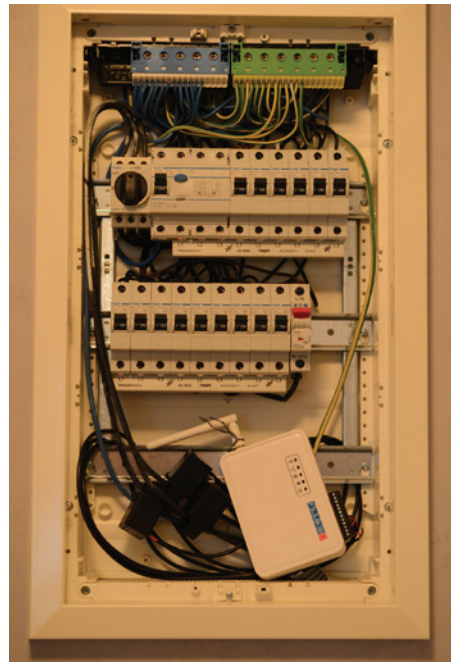
- **Helicopter Room Sensor:** an Arduino based light, temperature, humidity and motion detection sensor. It was powered by batteries and functioned with radio frequency (RF). Totally wireless and easy to carry. It had an ON/OFF button. Built at CIID.

- **Flukso:** an electricity power meter was connected on the fuse box to sense the total power consumption of the house every minute. It sent the collected data to the cloud with WiFi. This product was already available in the market.

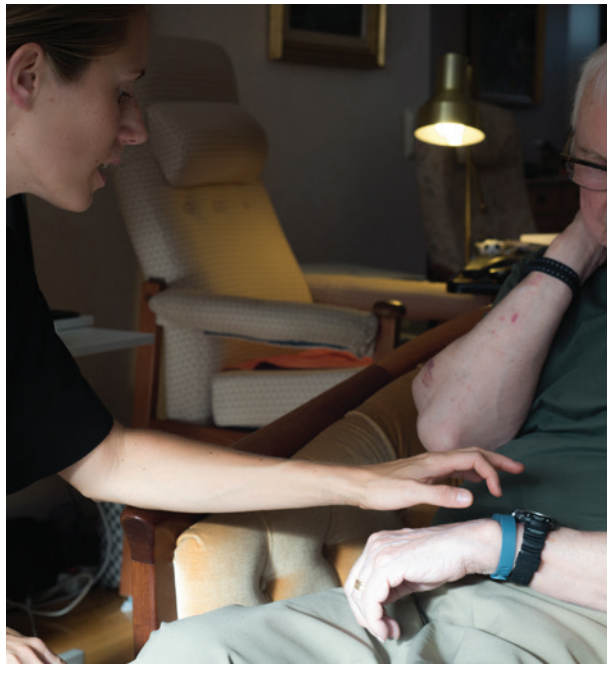
- **Fitbit:** an activity meter armband. In principle, this object is able to detect the activity of the person wearing it and to send the data collected to the cloud. To do this, it needs the use of a USB dongle, but we opted to work around this and decided to do the upload the information ourselves during a midweek visit to the participants.. The Fitbit was already available in the market.

Top left
The Helicopter System Centre

Top right
The Helicopter Room Sensors.



Bottom left
The Flukso.



Bottom right
The Fitbit.

EXPERIENCE PROTOTYPING IN SKÖVDE

// Living with domestic sensors for one week.

Gunnar, 85, Skövde (Sweden)

WHAT HE EXPERIENCED

Gunnar received the paper tools, the Helicopter System Centre, the Flukso and the Fitbit.

WHAT WE OBSERVED

He seemed to be very comfortable being tracked. He reported that this made him more conscious of his activities. He was already wearing an emergency alarm and a watch on his wrists, so for him it would be better if the functions of the wearables were combined into one single object. Before showing him the data tracked from the sensors, he was not really understanding the purpose of the project. Soon after the researchers brought him back his data retrieved in one week, he was intrigued by the analytics and enjoyed the details that were presented to him. He wanted to know what it could be possible for the researchers to read from the data without his help in extracting meaning from the graphs. He also expressed that it would be too much data for him to take in, in the long run.

" I wouldn't have let you in if I knew you could read all this from my data!"

> It seems that Gunnar had more control over his wearable bracelet than over the Flukso (electricity meter). The latter one, concealed in his fuse box, made him feel more surveilled than the Fitbit, which he wore on his wrist.

Top left — Gunnar working on the Network of care tool with the researcher.

Top right — Gunnar receiving his Fitbit.

Gunnar reviewing his sensors analytics at the end of the week.

Olle, 73, Skövde (Sweden)

WHAT HE EXPERIENCED

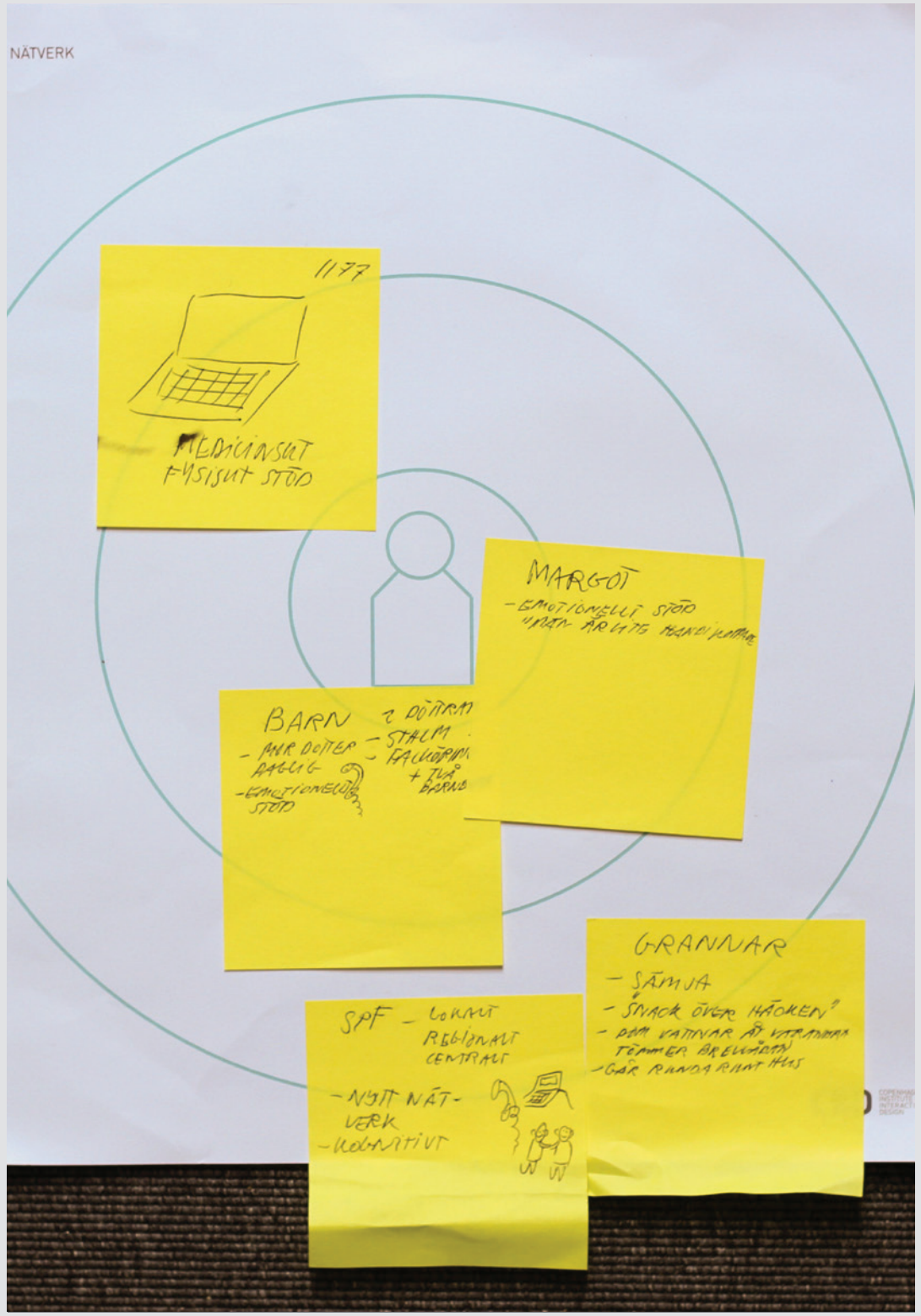
Olle received the paper tools, the Helicopter System Centre “house”, the Flukso and the Helicopter Room sensor. Knowing that his wife was not comfortable about the idea of having sensors in the house tracking her activities, the researchers tried to investigate the gray line between not making Olle wearing a sensor and at the same time not making his wife feel tracked. Olle was given the Helicopter Room sensor and was explained that his wife could turn it off whenever she wanted by pressing the on/off button. By doing that, the researchers aimed at investigating further the felt experience of the couple being monitored for one week.

WHAT WE OBSERVED

Olle decided to place the Helicopter Room sensor in the kitchen, because it was the room that the couple was inhabiting equally. It turned out that after one week his wife never switched the system off because she didn’t want to have anything to do with the service.

> It is a challenge to know whose the data belongs to if wearable sensors are not involved.

> Olle relies on an informal “social security network” enacted by his surrounding neighbours. Anyway, he would share information about his diseases only with the family and more day to day activities with the neighbours.



Olle’s Network of Care map.

Seija, 69, Skövde (Sweden)

WHAT SHE EXPERIENCED

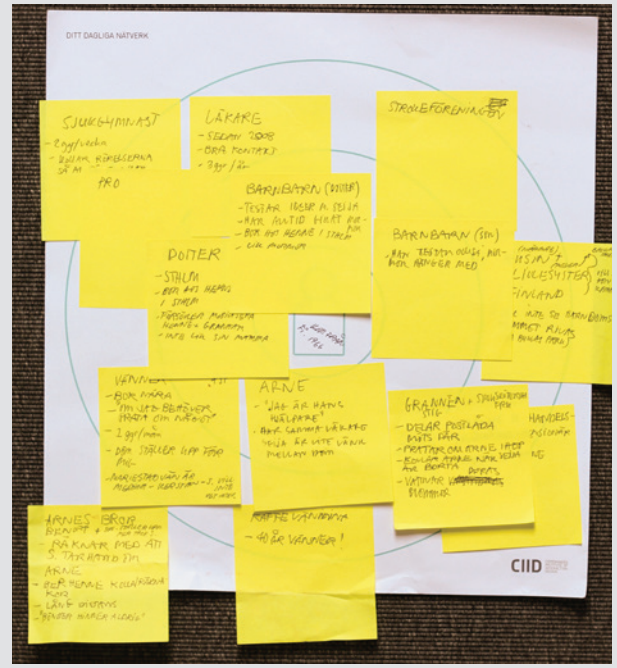
Seija received only the paper tools because she was not comfortable hosting the researchers in her house and let them install the sensors system prototypes. The visits happened at the local pensioners society where she works as a volunteer.

WHAT WE OBSERVED

She got really engaged in the Sharing vouchers probe. Together with the researcher, she focused on different activities she experienced over the week and listed the persons belonging to her network of care that she would accept sharing those activities with. Seija reported that she would be very comfortable and feel even safer if her daughter could monitor her. She would have no problems in sharing her daily activities also with her friends and neighbours, provided that the activities visible to them would not be about physical/health issues. Concerning that kind of activities, she would only allow her daughter to track her.

“ I do not see the need of worrying other people with my own problems.”

“ I do not approve the use of surveillance camera either in the city or in the house.”



Top left — Seija showing the pictures she took of her activities

Top right — Seija's Network of Care map.

Seija's Sharing vouchers.

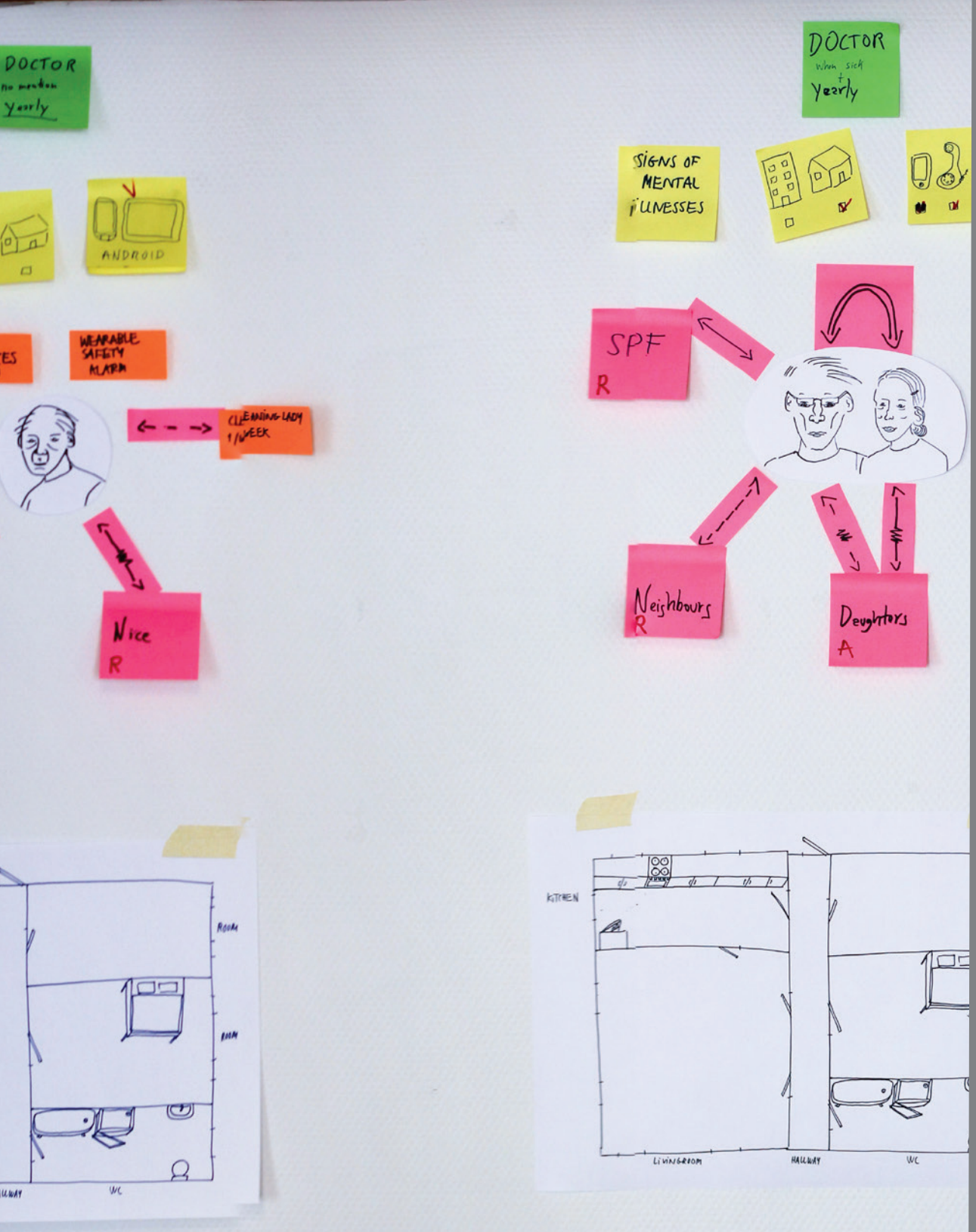
An adaptable service

Going to the field and prototyping with the participants in their homes gave us a very important preview of what the consortium would find when the official pilot phase started. It became clear that the quality and indications given by the gathered data would not only be dependent on what sensors would be installed and their specifications, but it would be also largely affected by the household being tracked.

For example, with the Flukso we were able to clearly see when an apparatus was switched on in Gunnar's house, who lives alone in a modern apartment, while the same data output was littered with noise in Olle's villa. More people living in the same house and sharing large apparatus, such as big freezers and a heating distribution system, meant that no longer we could detect accurately when devices with more continuous human interaction (television, stove, computer, kettle, etc.) were being used. Ultimately, if for Gunnar one wearable sensor and one home sensor were enough to very accurately monitor him and his daily life, the same could not be said for Olle.

A similar situation occurred with the tracking tools that required participants' input to gather data. The different personality of the participants influenced the details and characteristics of what could be perceived by us.

It is then important to retain that, in order to function, the service needs to be flexible to be able to adapt to the household to become useful.



PHASE 3: ANALYSIS

Deriving learnings from observations and make them actionable for the following concept generation phase

About CIID analysis methods

When researching into the "wild", a design researcher has the chance to explore a context by jumping directly into the field.

During the following analysis phase, the researchers can review the gathered material and continuously zoom in and out. At that point, meaningful insights strike on the researched landscape as mountain peaks of particular relevance.

One or a group of insights can lay onto a particular fertile ground, where new design solutions can be explored, addressing the learning gained from the fieldwork. Those places are the opportunity areas, which unfold at the bottom of the mountains peaks like valleys.

To generate new design solutions, researchers need to settle in the fertile ground of an opportunity area and prompt their creative thinking through innovation challenges, which are phrased as a positive questions to brainstorm against. An innovation challenge stands on a mountain landscape as a flag knocked in a valley.

The three phases of CIID analysis in icons: Extracting insights, Defining areas of opportunity, Generating innovation challenges

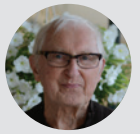
INSIGHTS

What we synthesised from our observations and direct engagement in the participants' context are insights, such as actionable learnings that would inform the concept generation phase of the project. An insight is formulated by clustering observations and users' quote together according to the meaning the researchers make out of them. By formulating an insight from a number of observations and/or quotes, the researchers manage to reach a first stage of abstraction over the big amount of fieldwork data. Insights are not scientific evidences that prove a hypothesis, but actionable intuitions that are synthesised to inspire the design process.

1

INSIGHT 1:

Relatives living far from each other are used to exchange summary updates about their health status on a regular basis. (In the morning or in the evening).



Gunnar, 85
About his caregiver network

"I am not so isolated, a relative calls me every evening to see if I am doing well."

"I am prepared: I gave the keys to my relatives and if I don't answer the phone, they can come and rescue me."

2

INSIGHT 2:

Remote communication can be more personal and reflective than face to face communication. Making use of it, relatives and independent elderly can enact a mutual exchange of care on a distance.

Seija, 69
About her caregiver network

"I have grandchildren living far from me and we phone each other regularly. I don't perceive it as them calling to check on me, it is more myself checking on them remotely."

" With my grandchildren I speak much more about life and specific occasions on the phone than face to face - when I am in Stockholm visiting them they are always to busy for that."

3

INSIGHT 3:

People living in the same community can act as human sensors for monitoring people they know.

Seija, 69
About her relationship with the neighbours

"Every morning I bring the newspaper to Arne. In this way I am checking if he is feeling all right and if everything is okay."

"Arne's behaviours tell me and our neighbours if he is feeling good or not: if he is all right, during the morning his car is never at home because he is visiting friends; at night he never keeps the lights on. In fact, the night he was about to get a stroke, I was warned by seeing the light on in his bathroom."

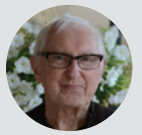
4

INSIGHT 4:

Mutual support among neighbours can help the less independent ones to carry on their ordinary life without needing external and formal assistance.

Seija, 69
About her perception of safety in her neighbourhood

" I heard about an elderly lady with Alzheimer's who wondered and died in a forest. I am afraid of disappearing like that. Hopefully people around me will check on me."



Gunnar, 85
About his perception of safety in his neighbourhood

"If they build community houses for elderly, the interest in monitoring technology will decrease since we will know and mutually take care of each other."

5

INSIGHT 5:

Self-tracking has an emotional layer lying in the expectations and reactions to the data of the person being tracked.

> One looks at self-tracking when one is doing good. Nobody wants to hear bad news.

> Tracking devices should help create teachable moments for patients.

6

INSIGHT 6:

Showing back the sensor data with visual methods, makes the data tangible and therefore actionable for the elderly.

> During the Experience Prototyping session, for Gunnar it was easy to understand what the sensors were about only after showing him the data visualisation from his wearable sensor.

Gunnar, 85
About his perception of domestic sensors

7

INSIGHT 7:

Members of the same family can have different opinions about sensors and feel not equally comfortable in being monitored at home, thus creating domestic tensions and “aut-aut” situation about the sensor use.

Olle, 73

About his wife perception of the domestic sensors

“Even if I would like to be monitored by sensors at home for my own good, I live with my wife and she is not comfortable thinking she is being tracked.”

8

INSIGHT 8:

Active and independent seniors do not see any need for being monitored 24/7 until they experience some life-threatening event or go through an ageing watershed. Moreover independent and active seniors want to be in control of the sensor system.

Seija, 69
About her acceptance of a domestic sensors system

" If it's some kind of surveillance, like a camera pointing at me, I don't want it in my life. But, if it is myself choosing to push a button, then it could be a good thing."

9

INSIGHT 9:

Sensors are associated with life-saving alarms, activated in case of emergency, not as a predictive measures.

" I moved into this building [with a domestic alarm system] because I was not feeling safe in my old house. Here I know they are checking on me and if something happens I can call them through the alarm."

Mrs Elstak, 89
About her perception of a domestic sensors system

10

INSIGHT 10:

Hidden sensors would not reveal if they function and are reliable, while elderly people want to be assured exactly of that.

Gunnar, 85
About the trust in his alarm system

“ I never use the alarm: it is only for serious matters, not everyday life. But sometimes I push the button and I check if it works.”

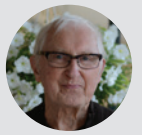
11

INSIGHT 11:

Routines and capabilities of the present become the goals of your future “older” self.

Olle, 73
On his ageing experience

“ While I am ageing, I want to keep the same habits and capabilities I have now. I want to be as independent as I am now.”



Gunnar, 85
On his ageing experience

“Looking after myself for the future means keeping on doing the things I like.”

OPPORTUNITY AREAS

One or a group of insights can detect a broader space where new design solutions can be conceived and explored. We call that space an "opportunity area". By delimiting an opportunity area from the intercetting insights, the researchers manage to reach a second stage of abstraction from the fieldwork data which sets the stage for the action prompted by the insights to happen. Interaction design researchers are very keen in crafting the way opportunity areas are formulated because they would map the rationale behind any further development of the project.

1

OPPORTUNITY AREA 1:

Monitoring with sensors as a remote and intimate way for distant relatives to look out for each other.

OPPORTUNITY AREA 2:

Involving the neighbours in the identification of meaningful elderly routines.

OPPORTUNITY AREA 3:

Creating teachable moments from negative results of the tracking.

OPPORTUNITY AREA 4:

Sensor sensitivity as negotiation between members of the household.

The sensing ability - “sensitivity”- of the sensors during the day needs to adjust to the different people living in the house according to how comfortable they feel being monitored in that moment and the caring/ responsibility for the other person who would like to be constantly monitored by sensors.

OPPORTUNITY AREA 5:

Sensor sensitivity as dynamic attunement to the self-perception of risk while ageing.

Seniors want to be in charge of their health and the “risk” they can handle daily. Monitoring for active and independent seniors is not a passive sensors network watching on the people 24/7, but a dynamic system adjusting to the sense of need and motivation that the seniors perceive day by day.

6

OPPORTUNITY AREA 6:

Sensors and their functioning as a domestic presence and trustful behaviour

The elderly could gain a better trust of their sensors system by making the sensors presence and their proper working manifest in the daily life.

7

OPPORTUNITY AREA 7:

Sensors to track the achievement of personal goals of the near future (e.g. maintaining the same routines and capabilities while ageing).

III.

INNOVATION CHALLENGES

Setting the ground for the concept generation phase

What is an Innovation Challenge?

An Innovation Challenge is a question inspired by the opportunity areas detected through the user research. The question is phrased as "How Might We..." and paired with a constraint, to inspire the brainstorm session.

For the Helicopter project, 7 Innovation Challenges have been derived, which gravitate around the main topics of:

- the elderly relationship with their relatives
- the role of the neighbours
- the subjective perception of sensors
- the reaction to self- tracking
- the personal goals of ageing

The Innovation Challenges set the ground for the following concept generation phase. They will be used during the brainstorming sessions during which a team of researchers and designers will sketch ideas on possible solutions to those questions.

INNOVATION CHALLENGE 1:

How might we support the exchange of remote care among relatives by enabling summary updates between them?

INNOVATION CHALLENGE 2:

How might we make the sensor system more personal to the elderly by leveraging on neighbours expertise on the elderly own routines?

INNOVATION CHALLENGE 3:

How might we create teachable moments for the elderly from a negative behavioural tracking by making the feedback tangible?

INNOVATION CHALLENGE 4:

How might we support the domestic coexistence in a household where not everyone wants to be tracked?”

INNOVATION CHALLENGE 5:

How might we empower the elderly for the control over their monitoring system by adjusting it to their perception of risk?

INNOVATION CHALLENGE 6:

How might we get users more confident and accepting of the sensor system by making the sensors and their functioning more visible and engaging?

INNOVATION CHALLENGE 7:

How might we support personal goals for the “future self” by tracking routines of the present?

IV.

CONCLUSIONS & NEXT STEPS

The People Centred Research helped the research team synthesizing actionable insights and unlocking several opportunities areas around the design of meaningful sensors systems for the elderly. The way its outcomes have been documented supported the transfer of fieldwork learnings from CIID researchers to the whole Helicopter consortium, so it can positively contaminate all the other, more technical, project work happening in parallel.

Going beyond the relevance of the data captured by the system, which would be intrinsic to the project itself, the People Centred Research aimed at setting new innovation challenges informed by the way seniors experience their ageing process and their perception of a domestic network of sensors monitoring for their health and independence.

The next phase of the project would focus on producing ideas that answer to the innovation challenges through brainstorming sessions and on developing further the most promising ones into well crafted design concepts that meet also the requirements of the Helicopter technological infrastructure being developed in parallel. A following deliverable (D2.3) will describe the concepts which derived from the People Centred Research and the methodology applied to reach such concepts.

V.

REFERENCES

BOFFI, L. & ARVIDSSON C. (2014) Making sensors meaningful for the elderly: Health and wellbeing monitoring. Workshop at the Stanford Medicine X Conference 2014. [Online]. Available at: http://medicinex.stanford.edu/conf/a/medx2014/conference/event/259. [Accessed: 21 January 2015].

BRANDT, E.; BINDER, T.; MALMORG, L. & SOKOLER, T. (2010) Communities of everyday practise and situated elderliness as an approach to co-design for senior interaction. In Proceedings of the 22nd Conference of the Computer- Human Interaction Special Interest Group of Australia on Conputer- Human Interaction (OZCHI 2010). New York: ACM. pp. 400-403.

BUCHENAU, M. & FULTON SURI, J. (2000) Experience Prototyping. In Proceedings of the 3rd Conference on Designing Interactive Systems. New York: ACM. pp. 424-433.

GAVER, W. W.; BOUCHER, A.; PENNINGTON, S. & WALKER, B. (2004) Cultural probes and the value of uncertaintyn. Interactions. 11 (5).

KALACHE, A. & KICKBUSCH, I. (1997) A global strategy for healthy ageing. World Health. 50 (2). pp 4-5.

MITNITSKI, A.B et al. (2002) Frailty, fitness and late-life mortality in relation to chronological and biological age. BioMed Central Geriatrics. 2(1).

SUBASI, O. & MALMBORG, L. (2013) Ageing as design culture. In Proceedings of the Nordic Design Research Conference 2013. Copenhagen- Malmö. pp. 398-401.

VI.

APPENDIX

Snaps from the field

Mrs Willems and Mr Cuypers showing where the alarm necklace could be hung in the bathroom

Family pictures collage on bedside table at a participant's house

A respiratory machine at the bedside table at a participant's house

Mr Domstorff excited about showing his new tool: a walker

Mr Domstorff 's LED equipped walker

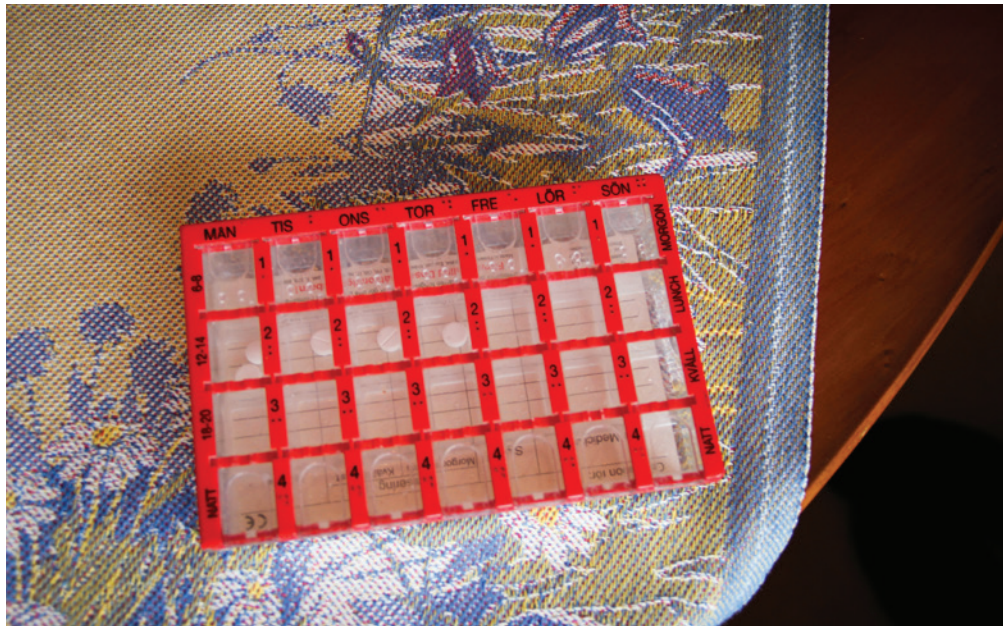
Mr Domstorff's kitchen cabinet communicates with the outside corridor

Way in of the kitchen cabinet from the outside

Mr Domstorff's family pictures

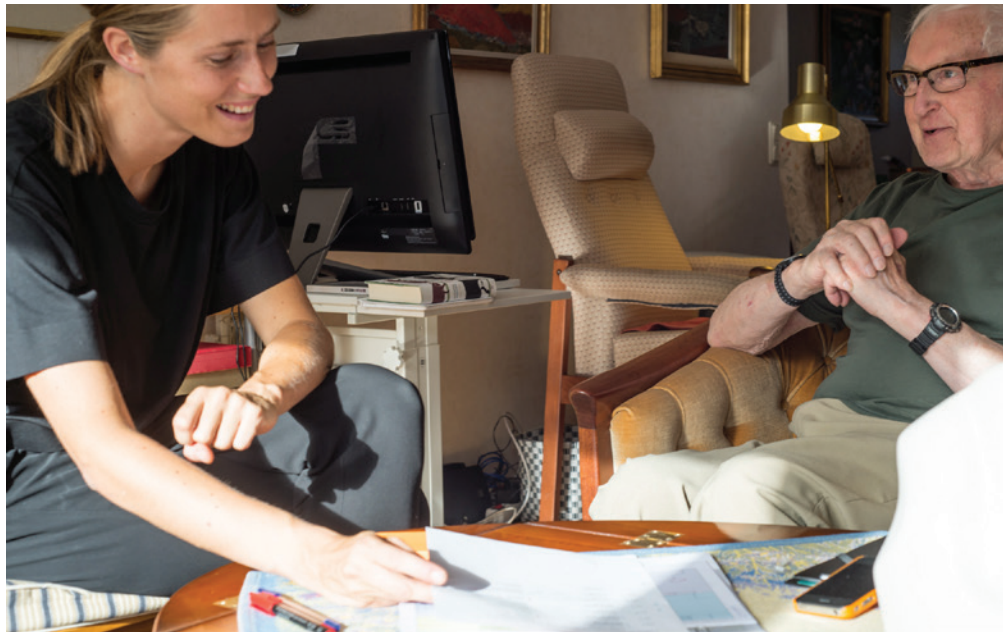
One of Gunnar's many thermometers

A shelf full of technological devices at Gunnar's house



Gunnar's organised weekly pill box

Olle showing a particular sole for ice slippage prevention



Gunnar received us warmly and was genuinely excited about the project

CIID researcher Caroline introducing the Experience Prototyping week to Seija

A DJ session with old records held by a member of the Elderly Centre in Skövde

The staff in Skövde Elderly Centre doesn't only provide care but also company and warmth

Gunnar's "control centre" surrounded with many devices and multiple computers

An affectionate coffee break at Skövde Elderly Centre

CIID researcher showing Gunnar our data results for his past week

Main statements of the participants being transcribed into speech bubbles during the conversations

Seija talks about her previous week

Table during an Experience Prototyping exercise

The finished memoirs of Gunnar in five folders

Personal network and diary tools being used in a session