AAL
PROGRAMME

FULL PROCEEDINGS

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FULL PROCEEDINGS
from the AAL Forum 2016

The AAL Programme is the EC's funding activity that aims to improve the quality of life of older adults and to strengthen the industrial opportunities in Europe through the use of information and communication technology (ICT). It carries out its mandate through the funding of multinational projects that involve small and medium enterprises (SME),

The AAL Forum 2016 had 30 interactive sessions, and a concerted effort was made to ensure that they were indeed interactive, moving away from the standard "speakers followed by questions" format and encouraging the organisers to run activities in which delegates were active and engaged and speaking to each other.

This publication provides a complete overview of all of the interactive sessions that took place at the forum in St.Gallen, as well as reports from the plenary sessions and discussions. The proceedings cover the whole range of perspectives that the topic of active ageing is being approached from.

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The AAL Forum 2016 Background

The AAL Forum 2016 took place in St.Gallen, Switzerland on 26-28 September. Hosted by FHS St.Gallen and taking place at the Olma Messen St.Gallen, the event welcomed more than 450 delegates, who were treated to talks from experts, interactive workshops, poster sessions, a matchmaking event, and many other opportunities to interact with the people who make up the core community of active and healthy ageing work in Europe.

The theme for the 2016 AAL Forum was "innovations ready for breakthrough". With so many of the products and services developed in the programme having reached a fairly mature stage in development, there was a concerted effort at this year's forum to talk about the challenges and barriers that may be holding them back from getting to market. The plenary sessions at the event discussed some of these issues in greater depth, bringing in stakeholders from a broad cross-section of the AAL ecosystem to offer their opinions and observations on the current market and to consider the mechanisms by which AAL products might become more integrated into our daily lives in the near future.

As ever, this year's event brought its delegates into close contact with the organisers and speakers, with 30 interactive workshops over the two main days covering topics including marketing; awareness, education and training; meeting stakeholder needs and expectations; bringing products to market; neighbourhoods of the future; and AAL in the year 2030.

The sessions were well received, with a mixture of presentations, group discussion and interactive brainstorming bringing about much-needed dialogue and teaching valuable lessons to those involved. As one delegate put it, "the chance to interact with people from all areas of the AAL world and to learn from their mistakes and successes is something you do not get anywhere else. I have come away from the forum with greater direction and knowledge about what I am trying to achieve with my project."

The exhibition of AAL solutions and products (page 14) was also a key part of the event, with projects and related industries able to demonstrate their products and services to a receptive and lively audience. The exhibition floor also hosted poster sessions, held over the two days throughout

the coffee and lunch breaks to ensure maximum participation. Projects were given the opportunity to present their products, deliver a poster and answer questions from the floor. It was informal and relaxed and the posters remained available to view throughout the forum.

For two days before the AAL Forum started, a group of eager and talented young developers and designers gathered to participate in the AAL's hackathon event called Hack for Ageing Well (page 41). At the end of the two days, the seven teams pitched their concepts and demonstrated their prototypes to a select panel of judges involved in AAL from several stakeholder groups, including end users. The winning entry this year was called Permanent Memories, an online service for sending photo-postcards, which are collected in a cloud service and printed on site.

This year marked a departure from the standard AAL award and introduced the AAL Smart Ageing Challenge Prize (page 33). Launched earlier in the year in collaboration with Nesta, the prize aimed to source Internet of Things innovations that empower older adults to achieve the

"The chance to interact with people from all areas of the AAL world and to learn from their mistakes and successes is something you do not get anywhere else"

quality of life they aspire to, socially and independently. After narrowing down from a shortlist of nearly 200 entries, 15 of the most promising applications were chosen as finalists and took part in a social innovation mentoring academy in Brussels in July, where they received expert coaching and support to develop their ideas. Five of these finalists were then selected to attend the forum, where they pitched their ideas to the delegates in one of the plenary sessions.

After careful deliberation by judges, Activ84Health was selected as the overall winner and received a cheque for €50,000. The brain-child of brother Jan and Roel Smolders, the smart system uses Google Streetview connected to a bike, cloud-based software and touch screen controls to allow older people, unable to get about as they once could, to explore familiar areas from their past. As well as stimulating memories, this activity also prompts social interaction in the home, while at the same time providing a valuable exercise routine. Each user has an individual profile, which allows the platform to take into account personal physical and cognitive abilities. "Just being in the top five was incredible," says Roel. "I am now completely overwhelmed and a little tearful. It has been fun, but I was nervous today.

"We have already won a number of innovation awards in Belgium with our Activ84Health Explorer, but we were always uncertain whether our new technology would be appreciated by others outside of our own country as well – and being here proves it is!"

As in previous forums, the matchmaking event (page 38) paired delegates with complementary skills and assets and allowed them to informally discuss possible collaborations for the future.

"Nowhere else in Europe will you get an opportunity to meet so many people within this field of work," said one participant. "I have come away with some excellent contacts and am planning on meeting up again with the person I was matched with to discuss how we can work together in a more concrete manner."

This executive summary provides an overview of the event from all key perspectives – with reports from key sessions involving the care-givers, living labs and smart homes. Opinion and analysis is also published from all tracks, from the awards, from the hackathon event and from the exhibition floor.

The publication also contains interviews with key stakeholders at the event. This content provides valuable background insight into the variety of opinion, analysis, advice and strategies that exists for AAL as it is now and for the future, how the opportunities in the active and healthy ageing market can be best exploited, what users expect, how industries such as insurance are getting involved, and co-creation.

Overall, this year's event provided every type of delegate with useful information and interesting discussion on AAL developments, whether they were researchers, caregivers, investors, or even the end-users themselves. Following the success of last year's drive to make the forum more interactive, the event this year in St.Gallen took heed and continued in a similar manner, making sure that people were not only listening to experts but also offering up their own valuable contributions to the forum.

The plenary session on Tuesday afternoon summed up the feeling of the event well with the launch of the European Commissions' digital innovation blueprint to transform health and care in Europe's ageing society. Acting as a manifesto of sorts for the AAL ecosystem, it recognised the need for health and care systems to keep up with the quickly evolving digital world, and set out a number of key issues and areas which need to be agreed upon across Europe so that the we can help improve the lives of the older adults among us. After all, that's what the AAL Forum is all about, and the optimism at this year's event can only have helped to reinforce delegates' determination to build products and solutions that will benefit all of society.

WORKSHOP SESSIONS

W1: AAL living lab within the IBH Network

Chair: Guido Kempter | Speakers: Petra Friedrich, Daniel Buhr, Isabella Hämmerle, Heidi Kaspar, Tobias Mettler, Sabina Misoch, Harald Panzenböck, Martin Rosenberg

The IBH Living Lab AAL was introduced at the workshop. The IBH Living Lab AAL is a new international network of universities, social services and technology providers who are collaborating to facilitate active and assisted living for people who feel excluded from social and economic life due to physical or psychological restraints associated with ageing. The group is looking to assist these people by developing individually customised ambient technologies designed to support and enhance the work of professional and informal carers.

The IBH Living Lab AAL will offer a holistic infrastructure for research and development in the area of active, assisted living (AAL), so that innovation and evaluation can take place in real-life settings ensuring they meet the needs of all stakeholders and end users.
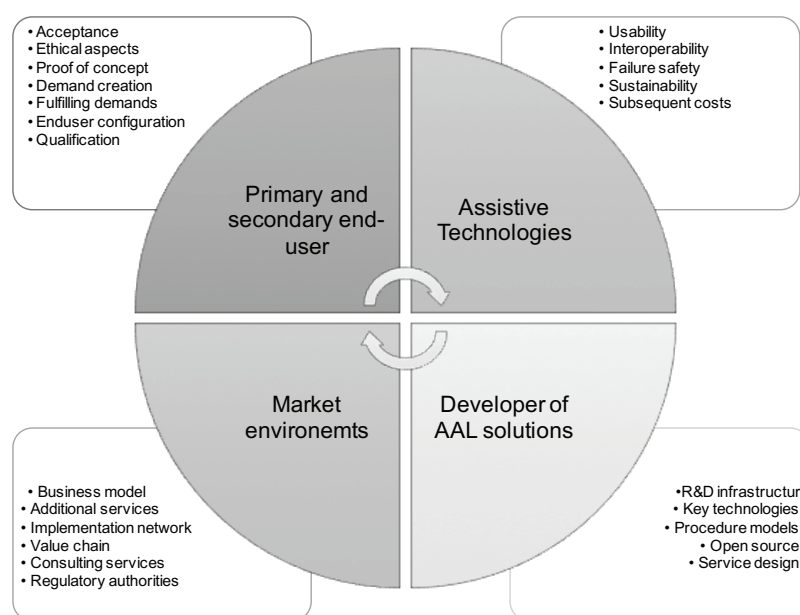
Living labs are seen as key testbeds for AAL innovation, ensuring products and services being developed by AAL projects not only meet the needs of those they are designed to help, but do so in such a way that they are commercially viable – people will want to buy them. As such, the "living lab" approach not only takes into account the technical environment and the psycho-physiological aspects of the end users but also cultural, organisational, legal, and market-relevant aspects of the ageing society.

Guido Kempter

The network is seen as a best practice example of collaborative working for AAL, with all its activities being located in the area surrounding Lake Constance and under the lead of a university of the "Internationale Bodenseehochschule" (IBH), which is an association of universities from Germany, Liechtenstein, Austria, and Switzerland.

The participants at this workshop discussed the following barriers for AAL solutions:

- Acceptance
- Ethical aspects
- Proof of concept
- Demand creation
- Fulfilling demands
- Enduser configuration
- Qualification

Primary and secondary end-user

Assistive Technologies

- Usability
- Interoperability
- Failure safety
- Sustainability
- Subsequent costs

Market environemts

Developer of AAL solutions

- Business model
- Additional services
- Implementation network
- Value chain
- Consulting services
- Regulatory authorities

- R&D infrastructur
- Key technologies
- Procedure models
- Open source
- Service design

The participants agreed that the following activities are needed to overcome the barriers:

- network the AAL solutions among themselves, in order to increase the efficiency of support
- provide decision-relevant information about reliable AAL solutions
- evaluate new AAL solutions for the purpose of an evidence-based launch
- elaborate AAL business and financing models
- offer municipal advisory services for the implementation and financing of AAL solutions
- panel persons in the Lake Constance region, which agree to participate in AAL studies
- transfer knowledge for professionals from different disciplines
- increase public awareness of AAL as an integrated concept for future care

Further reading: Bächle, M. Judt, A. & Mettler, T. (2016) iCare—supporting people with increased need for care with smart and mobile IT. European Journal of Epidemiology, 31, 34.
Hämmerle, I., Ritter, W. & Kempter, G. (2016). Ambient Light Guiding System to Improve the Motility and Mobility of Elderly People. 11th International Conference on Persuasive Technology, Salzburg.

W2: 4th Workshop on mobility solutions –Part 1
Chair: Christoph Stahl | Speakers: Eva Nuhn, Andreas Rumsch

Mobility is one of the core themes of the AAL programme. The quality of someone's life is significantly influenced by a person's mobility; as people get older and have problems going outside they can become afraid that they will lose their social contacts. The reasons they have problems going outside may be for health reasons or just a fear of falling or getting lost or feeling unsafe. A personal sense of safety is very important. Losing driving confidence comes with age too. Access to travel information is key too - if I want to travel, I must know the bus number and where to catch it. Even for younger people like us it can be quite difficult to use public transport.

So, key to keeping us mobile are systems that help us find our way, by foot or by public transport.

We started a couple of years ago, with a known research project and we concluded that, to provide such mobility services and solutions, it is not enough to tackle just one aspect but there need to be solutions that cover all these topics; starting from navigational instructions, covering direction; design and of course we need some method for positioning. For those with GPS it is relatively simple today but it is still challenging to find a good infrastructure and then we must deal with good planning and issues of accessibility; where we can go with a wheelchair for example; where do we have lowered curbs. That is not so simple and it leads to the accurate representation of the environment. There is routing and we need a lot of additional information to do this for pedestrians in a useful way.

We started working in this field in 2013 and have presented at the AAL Forum in Bucharest and Ghent. So, we are pleased to have some continuity in these workshops.

We have three speakers presenting their projects and we will have a second session, which will be an interactive discussion of topics related to mobility solutions. In the context of the Forum, this discussion is about how to bring mobility solutions from idea to the

market. I know that not every good idea from research leads to products that can be bought for your elderly parents, so we should share our experience from research projects but also from the industry perspective and to find out what the problems have been in these mobility related projects to bring the ideas to the market; what is the missing link? We will try to make a statement from our community, from our perspective, regarding mobility solutions and what is special about their design; what are the challenges.

In last year's workshop, we were discussing the problems of field trials. If you want to do it, at the centre of research with mobile solutions, you must use the people in their real-life environment, which leads to a lot of the problems for the organisation and so on and for the special needs of elderly people. Last year, we sat together and thought about that and it would be nice to make some collective statement on that this year as well.

We have three speakers - Eva Nuhn, Cornelia Schneider and Daniel Bieber.

Eva Nuhn is a PHD student at the institution for Geoinformatics at the university of Augsburg. This is the first time that we have seen someone from the Geoinformatics Institution here and this is good because there is also a lot of research going on there into auto-navigation issues, mapping and so on.

"Losing driving **confidence** *comes with age too. Access to travel* **information** *is key too - if I want to travel, I must know the bus number and where to catch it. Even for* **younger** *people like us it can be quite difficult to use public transport"*
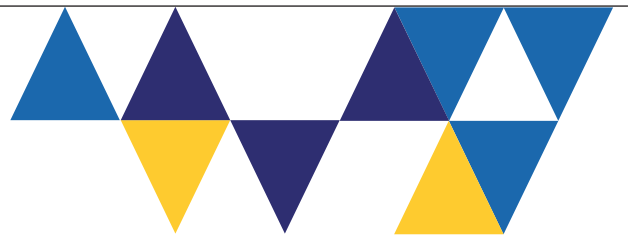
EVA NUHN

Provision of personalized landmarks for the elderly

My thesis is about the provision of personalised landmarks. Today I want to talk about some ongoing work on the provision of personalised landmarks and I will also present my thoughts about the provision of personalised landmarks, especially for the elderly.

Routing services for pedestrians are very important tools in everyday life. For example; if you want to go back to the hotel after the conference, you may have to take the bus and change buses. You can ask for help if you have to go from one bus station to another and are unsure of the way, you can use google maps and you will get a routing instruction for the shortest route. Although the routing instruction is short, it contains a lot of information.

For example, you have distance information, like 77 metres, which could be confusing because you may not know what 77 metres is. You even have compass directions like, 'go to the south-east', which could also be confusing if you are not sure where that direction is. There are also street names but if you are looking for a bus, you may not see street signs clearly. There is a lot of information here and if you consider the elderly, they can be even more confused by this type of information because the processing time for such a lot of information is high and the cognitive load needed to process this information is high. The use of such distance and directional information, alongside the use of street names is in contrast with the findings of cognitive psychology research, that has shown that even in the shortest routing instruction given by humans, landmarks need to be incorporated.

So, what is a landmark?

A landmark is an object that serves as an external reference point. So it can be anything that stands out from the background, for example the prominent Eiffel Tower, that everyone knows. It is not just because everyone knows it that the Eiffel Tower is a landmark but because it is much higher than the surrounding objects and stands out from the background.
If we were to replace the distance and directional routing instructions with

landmarks, we would get an instruction telling us to turn towards a landmark building, turn right at another landmark building and that is easier to follow.

Research has shown that by incorporating of such landmarks in routing instructions, we need less processing time and less cognitive load to follow them. This is especially relevant to the elderly, because they have more support for their navigation. The current landmark research is about providing landmarks for routing instructions. Nowadays a two-step structure is followed. Firstly, you need a database with so-called different landmark candidates - for example city buildings, point like objects, like traffic lights or street signs and linear objects like tram ways, rivers. In the first stage, these potential landmarks are detected with several algorithms. In the second stage, completely independent from the first stage, the routing is done. The routing is done completely independently from the landmarks. Only in the last stage are both results combined and route specific landmarks are determined, which can then be used within routing instructions.

This approach, used today, has several weak points; the detection process of potential landmarks is done using subjective attributes only. This means in the landmark detection process that only the visual, semantic, instructional attributes are considered. For example, this means that an object is investigated if it has a special height or a special colour against the surrounding area. Semantic attributes are used so, for example, is there a special use for the building? Meanwhile other attributes like being structurally attractive, for example, or being specially constructed or on a specific intersection are used.
There is no consideration of a personal dimension of a landmark. If you consider an elderly person, they can have a different perception of a landmark from that of a younger person. The incorporation of a personal dimension would be important for the detection of potential landmarks. The secondary point of this approach that is used today is that the detection of the potential landmarks and the routing is done completely independently, which means that the landmark information is not integrated within the routing algorithm. There is also no integration of personal landmark information directly in the routing algorithm to provide highly personal routes.

Why do we need personalised landmarks?

If you think of a young woman giving a routing instruction, she may say: 'just go down the street and turn right at the Apple store'. Her reference is the Apple store where she bought her iPhone. If she uses this reference with an elderly person, they may be confused because they are not familiar with the Apple store; maybe they think about a shop where they can buy groceries. If they look for a shop where they can buy apples and they do not find one, they may follow the street to its end and

become lost. If they find a grocery shop and turn right, they will also be lost. The provision of landmarks that are understandable to elderly people and personalised to their needs would be helpful for their navigational needs.

How can we provide personalised landmarks?

This is part of our ongoing work. We are currently developing a multi-dimensional model and this considers several inputs. Firstly, we have the established subjective attributes, the visual, semantic and structural attributes of landmarks and additionally to that we have a personal dimension, considering the knowledge, interests and personal background of the traveller. As well as that, we want to move away from this two-step approach and we do not calculate the route in advance but we introduce the start and the destination of the route.

In this multi-dimensional model the inputs are assessed and the effect of the inputs on the so-called 'landmarkness' of landmark candidates is determined. The landmarkness of an object such as a building is a measure of how suitable this building is as a landmark. For example, if the landmarkness is high, then this building is a very good landmark, depending on the input. Then, we want to introduce this landmarkness in a routing algorithm. So, we have as inputs the start and destination and we have landmarkness instead of distance information. The result will be personalised routes with personalised landmarks.

Which attributes are important for the personal dimension?

Within the personal dimension, we consider first, the user's background. This is mainly gathered through objective facts like demographic data. We consider gender, age, place of birth and education. Gender is considered because it is a known fact that women and men perceive things differently; they have different spatial cognition. Age is considered and this is important for elderly people, because it is known that elderly people have 'lower spatial abilities'. Place of birth is considered because of the importance of knowing where you are born; if you lived in the UK for example, you are used to telephone boxes which are red, while

> **"Research has shown that by incorporating of such landmarks in routing instructions, we need less processing time and less cognitive load to follow them. This is especially relevant to the elderly, because they have more support for their navigation"**

in Switzerland or in Germany, telephone boxes are not red – so, you are looking for things that may look different, if someone refers to a telephone box for example.

Education is also considered. If you think of a fireman who takes water from the street, he may be used to automatically looking for fire hydrants or other water sources, while other people do not even think about these things, especially for use as landmarks. Then, we consider the user's personal dimension because it has been shown, especially for elderly people, that we remember things more clearly if we are interested in them. For example, if someone is interested in the arts, he may notice all the monuments in the streets or other artificial things while other people may not be interested in such things.

Within the personal dimension, we also consider the user's goal that is independent of age. The user has one of three goals; reaching a familiar destination, like traveling to the same route every day to your place of work for example. Then there is reaching a new destination, when you are going to a new doctor or a shop. Finally, we have exploratory travel, so if you are new to the city and you want to explore it. This is important, especially if you are reaching a novel destination. There are studies that show there is a need for more landmarks and more personalised landmarks around the destination and in exploratory travel, you may need more landmarks along the route.

Lastly, we have the user's knowledge, which is a very important factor for elderly people. In general, we can say that the more knowledge someone has about an environment the more familiar he is with that environment and there is research that suggests that familiarity has some influence on the landmark preferences. Someone who is not familiar with the environment prefers landmarks that are highly visual and highly structurally attractive, while people who are familiar with the environment prefer special landmarks that have a special meaning to them, for example their home or the city museum. In Augsburg, for

example, the corn cob is a famous hotel tower in the shape of a corn cob and its description as the corn cob is only known by locals so it is a highly personalised landmark for people who live in Augsburg who are very familiar with the environment. Other people would not know what was meant by the corn cob if they were not familiar with the city.

The degree of familiarity with the environment relates to how personalised the landmarks can be.
It is generally accepted that elderly people have lower spatial abilities (awareness) and this may lead to two problems regarding navigational abilities where they often have greater difficulty retracing routes and they often find cognitive maps more problematic. Although they may have a cognitive map of the environment, they may have problems using it. If they are provided with highly personal landmarks, they would be helped through navigating the environment. This is important for people with dementia who store information in their long-term memory better and if this is supported with highly familiar landmarks that are stored in their long-term memory, like things known from childhood like their parental home, they will cope better.

Question
I think that this personalised information must be collected before you start the personalised navigation system. How can you do that? It is personalised. You can only do that if you know someone, the customer or the user.

Eva Nuhn
Yes. But this is new and we are thinking about it. I don't know if we can give people, especially elderly people, a lot of questions in advance. Perhaps the user, and not just the elderly person, has a routing instruction and is asked afterwards about the landmarks given him, whether they were good or not so good, this could help. For the elderly, it is a special case and not so easy, but in all cases, if you are required to fill in a lot of questions in advance, you might not want to use the system because you are bored with it before you start!

Question
We have had difficulty extracting information and identifying landmarks ourselves. It is hard to get such landmarks because we found that we had quite a lot of data but this data is insufficient and there are many features to consider.

Eva Nuhn
I think it depends on how you define such landmarks. We use semantics, proper nouns, if a building has a special use etc, so this data is very good. This normal data is open source data but other semantic information is more problematic.

Question
People with dementia may present a bigger problem for you. People, even at my age, tend to get lost in bigger cities and the thing with landmarks is that it may not work in large, highly populated cities where there are high buildings, because it will be difficult to locate the old buildings, if they are used as the landmark. It may just be a problem.

Eva Nuhn
Maybe people with dementia are not usually in such big cities alone! If they are just in their environment or their neighbourhood, they can navigate themselves there.

Comment
We cannot put them in prison. They can go anywhere they like.

Eva Nuhn
I know. This is only some thought in that direction. In my PHD thesis, I focus mainly on providing personalised landmarks and am simply sharing some thoughts on how we could use this for elderly people.

Comment
I would say that most elderly people would be living in their own area, where they are used to living and have moved around a lot so the chances are high that they could be guided by a landmark system using buildings from their earlier days, like their school and so on. If you don't move and stay in the same village or area, then

"In general, we can say that the more knowledge someone has about an environment the more familiar he is with that environment and there is research that suggests that familiarity has some influence on the landmark preferences"

this approach might work. That could be a first step in the right direction because, in big cities you have even bigger problems. Maybe it makes sense to focus on the simple problems first and then think about the more difficult big cities.

Comment
I am from Finland, which is not very densely populated. We don't have this problem with elderly people in small towns; they are close to their homes. Some will live all their lives in a small town of 25,000 people and they may disappear and then police and volunteers will search for them.

There were some projects that set safety boundaries - a zone is set and if the person exits from the zone there is an alarm that sounds, so that people are aware of this. There are devices where you have a geo fencing option where you automatically trigger an alarm and you can follow a person: There are already some solutions on the market. Of course, it is only good for the observer and not for the user.

CORNELIA SCHNEIDER
Combining mobility solutions and preventive measures for prolonging independent living
My talk will combine mobility solutions and preventive measures for prolonging independent living. I am from Salzburg research and today I will talk about a project in Salzburg where we are dealing with very old people, but also younger old people. Here, we try to support the needs of the younger group.

All of you know the AAL definition of gaining and improving the quality of life of older people, by helping them to live independently for as long as possible. We have learnt that we sometimes have problems with our target group. We all follow this idea of AAL but sometimes we need to find a new way. What we have learnt from previous projects is that we have focused quite a lot on frail, older people. We faced quite a lot of challenges because when we deal with this user group, they are sometimes in a poor general condition. As we get older, you usually have several diseases and must deal with these diseases because they have quite a lot of problems.

When technology comes into their life, they see it as a burden and not a relief. They also have quite a lot of stress, if they can't use the technology. Some people feel under a lot of pressure and so there is only a little benefit if they use technology.

So, our idea was to try things with a younger elderly group; people aged 60 to 79, with little or no support needs. Here, the advantage from our perspective is that we have people in a good general condition, people who are curious about new things; they have time to get in touch with these new ideas. Most of them like to give feedback about things that they have done with technology. They talk about their experiences. They try technology out, like a toy. You don't have a problem where a little bug in the system will prevent people using it again. They will try again and will maybe have fun when they are trying out things.

The very important point for us is that they learn to deal with technology when they are healthy and fit so that they will be able to use this technology when they are older and in greater need. We can also attempt maintenance of their current health status to prolong independent living, with these 'younger seniors'.
The AAL pilot region is in Salzburg, Austria, and we call this the Central region. Here, we tried out this approach with younger seniors, with little or no support needs and we equipped their flats with different ambient assisted living technologies. We also brought into their lives, technologies for assisting mobility.

In Central, we think a little bit differently about the term comfort, because in quite a lot of AAL projects, you have technology that is focused on things or activities that must be dealt with in a daily routine and we think that technologies should assist, but they should be able to deal with their daily activities themselves and not with technology, so we think that we should empower these people to do all their activities over the next 10 years. Therefore, we train them and hopefully maintain them to improve their functional abilities via certain training programmes, to reduce or even delay care demands in future.

We are testing this in sheltered housing schemes in areas in the region of Salzburg and people are supported by a social care organisation at the introductory phase of the project and during the project. Together with key users we identify the most important functions of the system: We have identified six functions; emergency functions are functions around the flat; 'my fitness'; 'my appointments' and 'my reminders'; 'my community'; 'my games and entertainment'; information about 'my energy consumption and my energy management', but regarding this, we are in discussion with our key users, who are not really interested in this functionality, so we took it out and brought in 'my games and entertainment' because this was something that our key users wanted to have in the system.

The 'my fitness' function is the part where we combine mobility solutions to prolong independent living. We developed certain apps, where people can record vital signs, everyday life activities, like hiking, biking or even ironing. We can gain an overview of

things that they have done during the day and during the week. They can do a self-assessment and, importantly, we have provided exercises for them, depending on their fitness level. They have been tested, so, they can perform exercises, with instructions on how to do them tailored for them. We have also implemented a reward system, where they are rewarded if they have performed certain exercises.

These things are integrated with a smart watch that they can wear. We have an accelerometer, which we use to measure heart rate and we have also implemented an emergency button. The exercises can be performed on the tablet. They can also record daily activities and the emergency button is on the tablet. We also have a scale where they can also record their weight.

The idea behind data fusion is to provide them with their results to motivate them to do more. We have a step count that is on the smart watch, using the Android service for step counting. We have an activity recommendation for hiking, cycling and walking etc. We also use the services of Android together with our implementations to be able to get the results. For activity recognition, we also have an SOS button. The SOS button is used more outside, not inside. People can feel safe if they go outside, cycling or hiking; they can press a button, if necessary and be connected to a call centre and get help. Here, we also use a GPS positioning; the call centre gets the current GPS positioning and this position is used to help the individual.

These are some of our ideas for mobility sport and fitness; we are currently in the field trial. Now we have 15 months of the field trial. By June 2017, the evaluation takes place of the fitness module and to give further insight into the other functionalities that we have.

Question
What is the smart watch based on?

Cornelia Schneid
It is based on Android. It is the HE Urban 2. It also has a UMTS (LT) module inside. So,

you can fold this device, which is quite important. You also have internet connections for transmitting GPS data and so on.

Question
Did you have some problems with radio lines?

Cornelia Schneider
Yes. We knew that we would have some problems, so currently, we have optimised the watch a little. Everything works for eight hours but not longer. We also know that numeral GPS watches, for example from Garmin or Polar, have a better life of eight or nine hours, due to the effective GPS recording and the LT module. There are always restrictions.

Question
What is the goal of the field trials; are people using this system daily?

Cornelia Schneider
For a few months, it was hard to work in all these flats because there was also quite a lot of home redecoration being done, too. Sixty people make up a big user group. Now, they are using the system alone, after an introductory 10 weeks, where questions could be asked each week about the power system, the fitness system etc. The first idea was 'how do you use the system in August?' and here we saw that we had quite a lot of power users. People had used the system three or four times a day, which is quite a lot. Some people had used the system up to 10 times a month. We had to analyse this on our people pleasers, because when you go through the average, there was quite a lot of use of the system. But, we found that people mainly used the functions around fitness, which is nice. They also used 'my entertainment and games'; they obviously like to play games. We had some problems with the appointment function, which was requested by the key users, but now, interestingly, only about 6-10% of people use this function, which is quite a small number. We will see how things go next year, because we have an intervention free phase of three months where we do not get any connection or data or idea of how people are doing, without intervention.

Question
Do you know how much other technology they are using for fitness, like other apps for example? Are they interested in such modern products as well and are they using them in parallel with your research? Is there some overlap?

Cornelia Schneider
What we tried to do was to find normal people from everywhere. We had taster days for people in the whole group and we had quite a lot of people in our group who had never used a tablet or a PC before. We had quite a heterogenous group because the idea was, when we recruited them, to fulfil a need, to present the benefit of the system to people who hadn't used technology. So, we tried to demonstrate the benefit of the project and we saw quite a lot of people weren't recruited. But I think that the system is easy to use; we tried to find a system that most of the people could use. It will be quite interesting to see how it is used over time.

Comment

Maybe, when your project is finished, it will be interesting to see how they continue without the new technology if you take it away.

Cornelia Schneider

They have the opportunity to keep it. We have several exit strategies.

Comment

In our project, we had some end user organisations, which made up a very large client base and from there, they could suggest people who could be motivated to participate in our project. So, if you want to do research with AAL, when you are building a consortium, you should look at some of these end user organisations - those that have already participated and are experienced in such research projects. They are very experienced in working with the sort of people that they can send to you and they can deal with issues like transportation as well, when users are brought out to where they are needed and then taken home. The organisations we worked with knew how to take good care of the people in the group, some of whom were 80 years old. This is useful if you want to participate in AAL projects.

Cornelia Schneider

There, you must be aware of certain biases because if they select the people, you will have a programme with disabled people. We had a potential target group of 500 and there is a social and economic department in the economic school in Vienna with us and they also tried to identify people for us and then discussed the trial with all these. It was hard because there were quite a lot of people willing to test, so we tried not to be too restrictive. In the end, to get the amount of people, we had to exclude four people because we did not think that they were well enough to do the test. We started with 65 people and now we have 60, because five people were not well enough. I would recommend that if you think that there might be a problem, do not include those people in the target group at the beginning.

The problems included mild cognitive impairments, for example. These people considered the system to be too complicated

for them. We decided that if these people are fearful of technology, then it would be difficult to motivate them.

Question

When you are collecting data from these programmes, do you have usage parameters?

Cornelia Schneider

We collect the data but we are also able to evaluate certain clips. This was also quite important for us because we thought that using this was easier in the first stage. But what we learnt was that when people came to a certain stage, they had a problem going from this stage to the next stage. We also found that we had a problem with the internet connection.

We also found that due to the tool that we were using, we could see which functionalities were used more than others.

DR. DANIEL BIEBER, INSTITUTE FOR SOCIAL RESEARCH AND SOCIAL ECONOMY

Introduction

The MOBISAAR project addresses three major population groups, which are increasing in number through demographic change: the elderly, the mobility reduced, and people living in remote areas with little or no public transport. "MOBISAAR" (mobility for everyone) is based on the results of the finalised project "Mobia" (mobility into old age), a technology supported service which will be extended for elderly people and also for people with reduced mobility in public transport throughout the federal state of Saarland, in Germany).

> "...The problems included mild cognitive impairments, for example. These people considered the system to be too complicated for them. We decided that if these people are fearful of technology, then it would be difficult to motivate them"

Since 2011, Mobia has been breaking down the barriers in public transport in the federal capital of Saarbrücken by means of demand-oriented development combined with services and technology. MOBISAAR will integrate employees of the publicly-funded labour market alongside with volunteers and volunteering guides in order to offer these services in a longer period of time. Therefore, the existing APPS are being modified and improved to cover the entire region of Saarland, to provide open interfaces to various services and to enable the different types of "mobility guides" with various qualifications of being integrated in the service process. Thanks to the MOBISAAR-call center, which provides these services throughout Saarland, passengers have the possibilities, with help of multi-modal access, to call a guide.

Furthermore, a barrier-free routing is being developed for Saarland, enabling passengers to plan and undertake trips. This routing will respond to the individual needs of the passengers by considering the conditions of the road, for instance the situation around the bus stops (high curbstones) or of the buses (is the bus equipped with ramps or not?). This will be supported by appropriate technical-devices such as smartphone-apps.

There are mainly three reasons for doing this project and the first is demographic change. We have more elderly and more people living with some form of impairment and, since people are living longer, we have more disabled people. These people may need a service so that they can move from A to B. But we have the big problem; the vicious cycle of public transport is the decreasing supply as well as a decreasing demand to the point that there is no public transport system at least in the countryside.

Another problem in Germany is that many people do not have the money to run their own car. So, we have the social and the economic responsibility to enable people to move without a car.

The first project we did was MOBIA, in which we worked with people supported by the government as they are long-term unemployed. The money that the state gives to these people must be given anyway for other jobs. We suggested a mobility project and the general idea was, if we sell this system after the funding from the government to other cities, it should not cost more than just the software fees.

With MOBISAAR, we are working in the countryside with volunteers, because there are fewer long-term unemployed people there. We also use volunteers, our so-called spontaneous guides; there are many students with a car in Germany, or in Saarland at least.

As well as the elderly and the handicapped in the countryside, we have found that there is another group of people restricted in their chances of mobility and these are the people who have no contact with a public transport system, because there is none; the third group are people cut off from public transport. They may live in a very small city and they may want to travel to a different city in Saarland, but cannot without a car or relatives who can transport them.

There are three areas where we want to create this service; densely populated areas; rural areas, with public transport and rural areas without public transport services.

The processes of MOBISAAR are very simple. For anti-stigmatising reasons and to have technology based areas, there are different possibilities for ordering the service; you can use the phone, mail and the web and use the APP. So, you have traditional ways to order the service and you have an APP. This is because we are a research project and a research project, in Germany at least, is required to create APPS. In the first nine months if the project we had more than a thousand requests via phone and mail, mainly phone, and only one order over the passenger APP. This was interesting.

We have another APP and this one is really important because we are organising the process of the service with this it. We don't track them, because that is forbidden so instead we send them a question: "can you do this service for this person, who wants to go from there to there?" And they say yes and the person gets the help he or she requested. This is very important and all the data we need for barrier free routing and the public transport system is here. People are directed via this app and if there are problems, it is also possible to make phone calls and it is sometimes necessary.

The process appears to be simple, but we do not only have to co-ordinate the people and the contract; we also have to co-ordinate people with volunteer backgrounds and this is not so easy.

Question
You were speaking about public transport and the elderly but your APP, if I understood correctly, also requires volunteers and unemployed people to provide transport. Is that correct?

Dr. Daniel Bieber
That is a big problem now because the long term unemployed, at least in Germany, do not have cars anymore; it is impossible for them to have

cars, so their job is to walk with the elderly from their starting point to the nearest station of public transport.

Question
So, are the volunteers there as public or private transport? Are they insured or not?

Dr. Daniel Bieber
They are insured and they go with their own cars sometimes. The problem now is that the public transport system does not like the idea that public transport in the future will be people in their own cars transporting other people and no longer using the 'public transport' system.

We have tried to make them aware that big car companies are now in the business of providing services with car rental; there is car sharing and we are saying, make public transport without using your buses and your trains. They don't like this idea at the moment but I'm hopeful that they will see that this can be the future and can earn money for them. People may pay money for the volunteers or for the system that allows the volunteers to bring them from A to B.

Question
Would that be a problem with the taxi companies?

Dr. Daniel Bieber
Actually, we have no problems with taxis. I am waiting for the letter every day. I have discussed this with people from areas with very few inhabitants and they say something that makes me feel good: There is no taxi service available. So, the taxis cannot complain because they are not there.

Question
Is there no service like a bus that you can call or a sort of taxi like exists in Luxembourg? All the villages in the transport system can make a call and a very small bus will come and take you everywhere for a small fee.

Dr. Daniel Bieber
Yes, we have one and for one route only. They killed the regular bus and created this kind of taxi; a small taxi paid for by the public, but coming if you call it. This is only for one line. It is too expensive for public administration. They started with 100,000 euros a year and after two years it is 130,000 and that is too expensive to run.

Question
How do the users' feel taking such a service, where they are not supposed to pay anything and have people volunteering? Does this make people feel uncomfortable?

Dr. Daniel Bieber
In order to prevent stigmatising people, we say that it is a first-class service that you are ordering and we say that our guides are very well prepared to do this job. We give them four weeks professional training about everything; how the system works; how to deal with a wheelchair etc. They say it is okay. The problem now is that we do not have that many customers at the moment because in this 'automobile addicted' era, every person who needs transportation has other solutions - they have friends and family, for example, to bring them from A to B, so we have strong

We take everybody, but the volunteers have to do four-hour training sessions, to be approved by the MOBISAAR service. That is essential and they must get a criminal record check from the police. There is a four-hour module dealing with wheelchairs; people learn how to move a wheelchair to and from and on the bus. They learn how to talk with people.

To use the service for the first time, we must get the customers' profile to the service centre. The service centre has the profiles of the customers. If the customer has mental health problems or a history of strokes or something like that, we need this information so that the guides are aware if something happens. So, the first time that you contact the service, your profile is taken and everyone in the service is aware of what can go wrong.

Motivation of the volunteers? Yes. That is always a question. We have just started using volunteers. We started with the first franchise. We have four volunteers now and a limited number of people. We work with organisations, who are very experienced with volunteers. They give us ideas that will help keep us on track. At the moment, our concern is that we don't have enough customers for the volunteers and they cannot work and they may look for another job. This is our main concern at the moment.

Comment
For the younger elderly person, this could improve their social life and get them out of their homes. Not all elderly people over the age of 65 are disabled and they could be volunteers, too.

In the UK, there was a project on a website, with a bank of services that were open to younger people to do volunteering.

How could this work with the elderly, to get back for free, the same volume of work that he has given previously. You put your hours in to have future services that you don't need to pay for it. That was the motivation.

W3: Mobile transformation: Apps and methods from IBM and Apple
Chair: Joern Skerswetat | Speakers: Marcel Kuste

Mobile solutions help to synchronise care activities between older adults and support organisations. Simple apps can build stronger relationships between carers and those who need care, making everybody's lives easier. This is a niche that has seen much activity in recent years and there now exists a large portfolio of offerings that can help with this type of communcaition. This session looked at apps and methods that have been developed by IBM and Apple to address these needs. The participants learnt how mobile apps can transform the way that organisations and service providers communicate with older adults.

IBM and Apple have formed a partnership with the aim of changing the way in which people work. One of the main issues they are addressing is ageing populations, with the underlying goal of changing the lives of older people. They are looking to provide processes and tools to employees and people so that they can do a better job.

The partnership will provide care organisations that look after older people with tools so that they can do a better job with better outcomes. But as well as care organisations, they will provide the people themselves with tools, as well as family members, relatives and friends.

Why are they doing this? Ageing populations create huge economic pressure. There are more and more older people that will need to be supported by society and fewer young people to care for them. That is a permanent economic impact, so different ways to address this are needed. If we carry on as we are today, it will not be affordable and it is not what older people really want either. Technology can play an important role, in allowing us to work more cost efficiently, providing a better quality of life for older people in the future.

One trend that has become apparent is that people definitely want to stay in their houses for as long as they can; they want to stay in an environment where they feel familiar. The IBM-Apple partnership is building around this desire with technology to allow people to stay for as long as possible at home, but at the same time to give them the services that they might need if they have health problems.

A lot of personal needs of older people are not being met. For example, social engagement and communication – keeping people somehow interactive. When people are older, it becomes even more important to have relationships with the family and with other people that they can relate to, so we have to work with the communities in order to make this happen. Loneliness is an important factor in the ageing process: We should aim to keep these people interactive and part of society.

IBM and Apple are looking at how to make money too. They are companies that need to earn money and see a lot

of potential for business. This population typically has a lot of income potential as well as its cost avoidance. If you look at social systems, health insurers; they have an interest in keeping costs low.

A whole economy can profit from things like this if we can get these things right. We can start talking about it, but there are not so many offerings right now in the market; it is something that is starting now and there are huge opportunities. This has been one of the core ideas of the IBM-Apple partnership. They are not just creating apps with a certain functionality; there is also the intelligence behind it and analytics. They are thinking of not only providing features and functions but intelligence services as well, that help older people to have a huge amount of data, read recommendations that fit to them.

Some of the robots at the forum this year are somehow communicating and keeping people engaged. Older people want to have interaction with somebody that understands what their needs are and what they want. The goal of the new platform from IBM and Apple is to enable a high quality of life whilst living at home. This will require monitoring, so they are using Internet of Things connected devices, collecting a lot of data and information about wellbeing and health. Then, community, social programmes, support services and medical services.

The partnership has performed studies around how senior citizens would work with mobile devices; accessibility requirements; finding out the best way to interact. From forty years of age, our visual capabilities decrease from the muscles; we start to lose capabilities, and hearing, and from the age of 70 there is typically cognitive decline. These are all factors that we need to pay attention to.

Joern Skerswetat

The partnership has chosen tablets as a method for providing their services, with large buttons with voice control. They have provided various solutions. For instance, one app is for the older people themselves, while a second app is for the support organisations, so that they can have an overview of what is happening with the people that they are caring for. This is all connected; so, it is faced to each other. The third app is for the family members, who want to keep in touch with their relatives and to see how well they are and to see what is actually happening. This is for a smart phone because as a family member, you will typically have your smart phone with you, not a tablet.

The app for older people has a dashboard with big letters and darker colours; these are the results of the research in the Japan and the Tokyo laboratory of IBM. There the research suggests that darker colours are better for people with a deteriorating eye sight. The icons are also really bright and big, so everyone can see what the different things are meant for.

W4: Building engaging web and mobile solutions – iCareCoops

Chair: Johannes Burger | Speakers: Louis Cousin, Andrea Kofler

The speakers conducted three group-workshops with participants to evaluate the current prototype of the iCareCoops web-platform. In addition, each speaker presented relevant project results:

- Johannes Burger summarised the methods applied in iCareCoops' user-centred system engineering approach.
- Louis Cousin explained the reasons for employing the cooperative model and the social benefits for the care communities.
- Andrea Kofler elaborated on the definition and involvement of stakeholders in the context of iCareCoops and their role in multi-stakeholder cooperatives.

The participants gained a better understanding of end-user involvement throughout the system engineering process in AAL. Due to the first-hand experience in the workshop sessions they are able to easily employ some of the presented methods themselves.

The team of iCareCoops collected valuable feedback concerning the software-prototype including bugs, UX issues and optimisation ideas. Most of the remarks have already been integrated into the next prototype version. In addition, new ties to other projects and organisations were established with a high potential of future collaborations.

Finally, the workshop was designed as an integrative session aiming not only to inform about the project and its methodology but also to apply parts of the methodology i.e. the expert evaluation. Thus, the team of iCareCoops got an evaluation of the methodology applied in the project in addition to the new UX insights.

Participants gained a better understanding of why and how to involve end users in their solution development process from the very beginning, only requiring small staff and cost efforts. Through practical examples from the iCareCoops project, processes were illustrated, promoting their application.

Furthermore, participants took part in an exclusive design walkthrough of the iCareCoops solution, in order to apply the knowledge presented beforehand. By doing so, objections are reduced through active involvement in a real-life system engineering setting, while expert feedback is gathered for the iCareCoops solution itself.

Summary of agenda:

A. PRESENTATION (30 minutes)
- Introduction of the objective and the agenda
- iCareCoops project overview (focus on cooperative model and requirements)
- Summary of methods to be applied in user centred system engineering

B. WORKSHOP (in groups, 30 minutes)
- Discussion and experience exchange on user involvement
- Design walkthrough of selected parts of the iCareCoops solution

C. LESSONS LEARNED (30 minutes)
- Aggregation of design walkthrough insights
- Workshop review and reflection

The session presented the iCareCoops solution design process up to the current date, leading towards a design walkthrough performed with experts present at the session. Based on the insight from the iCareCoops project, selected design flaws, which are not obvious when developing, were seeded into some of the presented interfaces to enable a positive learning experience for all participants. Finally insights gained through the group workshop were gathered and presented to all participants.

Further information

Ruscher, S. H., Burger, J, Sauli, E., Kofler, A. Ch. (2016) Implementing WCAG and ISO 9241 in AAL Software Applications - A Case Study. 2nd IET International Conference on Technologies for Active and Assisted Living (TechAAL 2016).

W5: Is TV really the devil?

Chair: Rute de Sousa | Speakers: Helena Canhõ

The first United Nations' Millennium Development Goal is to eradicate extreme poverty and hunger. Following this objective, the European Union has been developing programmes and funding research projects to assess and fight food insecurity. WHO's European Food and Nutrition Action Plan (2015-2020) aims to reduce inequalities targeting vulnerable populations.

In Portugal, the aim of the National Health Plan is to maximise health gains and to improve health in all individuals, reducing inequalities. Because of decreased financial resources, increased comorbidities and poor physical strength with ageing, older adults are more likely to face needs making them more vulnerable to adverse health conditions.

Food insecurity is a worldwide problem. The concept is mainly focused on limited or uncertain food accessibility, and availability due to lack of resources. However, the elderly experiences nutritional deficits and limited or uncertain food use due to function impairments and health problems. Food insecurity has been a risk factor for poor nutritional status and low muscle power especially in those with physical disabilities, increasing hospitalisations and death.

The lack of epidemiological information, valid and useful to support decision-making, constitutes a major public health challenge in Portugal. Moreover, there is a lack of population management programmes in old people targeting nutrition, balance, muscle strength and clinical outcomes in order to optimize health status and reduce health resources consumption.

Taking into account these principles, we developed an intervention programme based on new ICT –TV interactive programmes that will be available as intervention tools that aim to improve knowledge regarding healthy food acquisition and confection at low prices and implement regular physical exercise in elderly. The primary outcome will be the improvement of food security among elderly. The clinical endpoints will be the improvement of dietary patterns, indicators of nutritional status, serological markers of cardiovascular risk, body composition balance, muscle strength, balance and control postural, physical activity habits and quality of life contributing to falls prevention. Ultimately, it will contribute to the improvement of health status, decrease of morbidity and health related costs of a main vulnerable group in the Portuguese population.

The consortium is composed of a group of leading experts on different fields.
The main goals of the session were to:

1. Introduce of a tool developed by the research group and produce discussion about it
2. Debate ways to increase the engagement of older people with educational and motivational programmes
3. Discuss new ways of applying the technology developed to help the elderly, in order to take the most out of the TV app.

Introduction
The session began with a presentation about the concept of food insecurity, explaining some of the known numbers in both Portugal and Europe as a whole. As well as outlining the essential nature of the problem, the session also focused on the impact of food insecurity.

Elderly live longer life but have higher disability and poor quality of life due to chronic diseases. Chronic conditions are responsible for 70 per cent of all deaths but just four health behaviours lead to most of the preventable chronic conditions. These are:
• Poor diet
• Physical inactivity
• Smoking
• Alcohol misuse

It was in this context that the session highlighted some of the dietry patterns in Portugal and Europe that can be addressed lifestyle changes that can be motivated through smart TV. This was explained using a simple gamified technique that explained the expectations and stereotypes about southern Europe and northern Europe in terms of diet and presented a picture of the elderly in Portugal and Norway with regard to dietary patterns, lifestyle and exercise. This offered a bridge to the justification for the use of intervention using TV.

Smart TV as a vehicle for education and motivation, and therefore intervention

This session focused on the grounds for the use of TV for intervention with seniors. The session also presented the project's history of the development process of a TV app for the elderly based on scientific evidence.

It started with an interactive element, during which the audience was asked to identify reasons why they though "TV was the devil or not", based on its impact on life. Many positive elements of TV were identified, although some of the negatives were also aired. These included:

- It's a sedentary activity, leading to lack of exercise
- It exposed people to food advertising, which does not always lead to healthy diets

This was supported by some facts delivered by the project, which included:

- On average, 40% of daily free time is occupied by TV viewing within several European countries and this corresponds to a daily TV viewing time of about 3.5 to 4.0 hours.

Statistics support the fact that this level of behaviour leads to higher incidences of type 2 diabetes, cardiovascular disease and causes of general morbidity. For example, 67% of nutritional information is gathered through watching television.

However, with the advent of digital interactive television services, it is also established that this has the potential to deliver better health and social care information to people in their own homes and this could lead to significant health benefits.

The Senior.Saúde.Come TV app
And explanation of the healthy lifestyle tool designed for the elderly

TV offers a tremendous opportunity to engage with millions of elderly people to help reduce behavioural risk factors that lead to chronic diseases and help people maintain and improve their health and wellbeing.

The Saúde.Come team is composed of multi-disciplinary experts including nutritionists, doctors, physical exercise experts and engineers. Together, they have developed a health intervention tool that utilizes ICT in the form of an innovative interactive TV application.

The TV app contains nutritional and physical exercise programmes. It contains tips about nutrition, healthy and low-cost recipes and physical exercise programmes. It also contains brief reminders on health behaviours and short questionnaires. These are delivered over three months of a trial period for the user.

The programme of interventions and the various motivational activities are diffused to the target audience through the TV application. The nutritional advice is taken from a book published by the Portuguese directorate of health about healthy eating on a low budget, called Alimentação Inteligente. And the recipes were developed specifically for the target audience, with nutritionists and medical doctors involved along the way.

Meanwhile, the physical activity programme was developed by physical exercise experts with the main goal of encouraging people to do more physical exercise in the home, motivating people to do at least 30 minutes at least three times a week.

The reminders, which pop up on the TV screen during favourite programmes of the viewers are designed to encourage these lifestyle changes. Text messages are also sent, encouraging participants to adhere to the programme.

Interactive TV will also be used to collect data to evaluate programme compliance. Short questionnaires are sent out in order to monitor lifestyle changes and evaluate learning along the intervention trial period of three months.

Summary
As well as presenting the project solution in the form of an interactive TV app, the workshop also looked to gather information from participants in reaction to the use of this sort of technology ads a means of improving lifestyle choices and so the health of elderly people in the home.

In conclusion, the workshop concluded:

- A richer and more scrutinised intervention programme (educational and motivational) in elderly patients through smart TV was a benefit
- There were suggestions about how improve the usability of the intervention programme
- New ideas to make the most of the TV app
- That the establishment of a network of potential partners for adoption and diffusion of this form of education with elderly people is required
- The group participated in an application with partners we met on AAL 2016 Forum for further research in this area.

W6: Bringing AAL innovation to real life: what investors need

Chair: Angelo De Rosa | Speakers: Babara Castellano

What do investors look for when people pitch their AAL solutions? This is one of the most important questions those involved in AAL must ask themselves. The workshop on investors asked the question to a panel with differing perspectives and experiences.

Angelo De Rosa, a member of the AAL advisory board, chaired the session "What investors need". He started proceedings by reiterating what has been heard many times in recent years; the AAL market holds great potential, but at the moment many struggle to find funding. He wanted the session to dissect the possibilities, challenges and experiences surrounding the funding process.

Peter Wintlev-Jensen of the EC believes that the AAL market has now evolved and is finally starting to emerge as a real market. Creating scalable markets is an issue, and a critical mass is needed in the public sector. The question is, as a collaborative research programme, does it have the capacity to challenge commercial development? The long-term research goals of Horizon 2020 such as artificial intelligence and robotics will come in the future, and these may well attract investment.

Barbara Castellano of venture capital investor Panakes Partners asserted that there is not a lack of interest from private investors. Indeed, they are in fact very interested in AAL projects, with the ageing population providing an ever-growing market for products that improve quality of life and stop the onset of disease before it becomes debilitating.

She then went on to outline the five things investors look for when being presented to by a potential investment opportunity. The first is whether the group has clearly identified a market. You need to demonstrate that customers exist, that you have a revolutionary treatment, and that you are ahead of your competitors. Second point: how big is the market? You must have a clear idea of whether you are aiming for a niche market or larger; overestimating or underestimating is off-putting to investors. Third point: who will be buying the product – healthcare providers or patients? If the presenters are not sure of this, it demonstrates a lack of commercial consideration. Fourth point: has the team presenting got a good track record? Investors want to see commitment in the team. And finally, the fifth consideration: has anyone

else invested, and who are they? If others are involved and can bring valuable expertise, more investors are likely to be attracted in.

The next speaker, a leader of the AAL Business Support Action for the last three years, emphasised the need to get a good team around you if you want to attract investment. AAL projects often consist of a number of organisations, and this can seem unwieldy to investors. He suggested having a core group, a company who the investors could relate to. That group needs to appeal to the ambition of the private investors; they are in it to make a high return on investment, and so it is of tantamount importance to demonstrate that you match their ambition and motivation.

AAL projects are not competing with each other – they åßare competing with start-ups! What is the difference between an AAL project and a start-up? Start-ups are lean, agile, and have fast iteration cycles. The people involved have to rapidly learn how to prototype, and experiment a lot with this. They also have to

learn how to make a business viable quickly, otherwise they go under. The reality of their existence is tougher, but this also makes them more competitive. AAL projects should take heed.

Up next was the owner of a small SME which has been involved in a number of AAL projects since 2010. He talked about the value of dissemination. Showing that you attracted the attention of respected scientific publications is attractive to investors, and it is also important to show how you have dealt with problems, major or minor, during your projects. Most of all though, practice how to pitch! Don't make it too technical – investors want the hard facts about whether or not your product is worth investing in.

Overall, the take home message from the session was that it is important to have a solid game plan before seeking investment. Predict the questions that the investors are likely to ask, and make sure you have con dent answers with the evidence to back them up.

W7: AAL for all: Multi-stakeholder co-creation session
Chair: Rens Brankaert | Speakers: Marcel de Pender, Frank Verbeek, Paolo Ciampolini, Fredrik Knutson

The workshop was set up in two parts. In the first part the experts shared their role in the AAL project ENSAFE and how this together forms the ENSAFE system.

In the second part the experts worked with the participants on a multi-stakeholder workshop. This was an interactive session so people could learn about each other and about what multi-stakeholder collaboration means.

Everyone got a role, and answered our main project question within this group. Later we compared the different insights everyone came up with from the perspective of their role.

For us the main contribution was in verbalising the role of each of our projects partner in a concrete contribution for the ENSAFE system.

The participants learned a lot. They learned about the ENSAFE project in the first part, and in the second part they learned a new tool for collaborating with different kinds of stakeholders.

W8: 4th Workshop on mobility solutions – Part 2

Chair: Christoph Stahl | Speakers: Daniel Bieber

A year-long study looked at how feasible it would be to establish a cost-effective pedestrian navigation system in Germany that can likewise, be adapted across Europe, to fall in line with the changing demographic of the elderly.

Daniel Bieber of Iso-Institut, and Hartmut Asche from the University of Potsdam, led a presentation to participants of workshop 8 on the feasibility study of project EasyGoing. A feasibility study was undertaken as to begin with, after the projects initial proposal was rejected, EasyGoing was recommended to find a partner from the geographical department and complete a study for one year. The gathered data should then be passed to the Germany Ministry of Research explaining what should be done to make outdoor pedestrian navigation possible.

And so, EasyGoing was to find answers to two pressing questions: is there a big market for pedestrian navigation and if so what has to be done to achieve it; and, who needs the navigation?

The project began by mapping a number of key areas that the product needs to cater to, these being the impact of the demographic change – an older population – and how it would need their needs, the need to create a smooth mobility chain for the transition on indoor to outdoor navigation and from public transport to the final destination, and finally, EasyGoing needed to find the right tools and applications to implement the system.

From here EasyGoing focused on understanding who 'the' pedestrian is in order to try and create a product that catered for the individual. They asked themselves what the characteristics of their users are, do they have any disabilities or impairments, do they have any extra devices such as wheelchairs to consider, and what are their requirements with regards to security and social participation for example. Some solutions to what 'the' pedestrian might need for navigation included using landmarks for orientation and a device that could cope with giving directions for low speed mobility - and what Google Maps can't do.

After a qualitative survey of potential users was taken and evaluated through content analysis EasyGoing concluded from their results a number of areas to progress the study for pedestrian navigation. Users revealed that they didn't use Google Maps for directions but instead used their PC first, and users also suggested different tools they could use if they were to use pedestrian navigation in the future and this included: vibrations, voice guidance and smartwatch.

At the end of the feasibility study year, EasyGoing not only acknowledged that creating a pedestrian navigation system would be complicated but it believed it would not be impossible and is actively finding solutions to not only better understand who their target market is and what they want, but also in collecting, converting and using the data they collect on pedestrian navigation, for a product that works for everyone and for the individual across Europe in a cost-effective way.
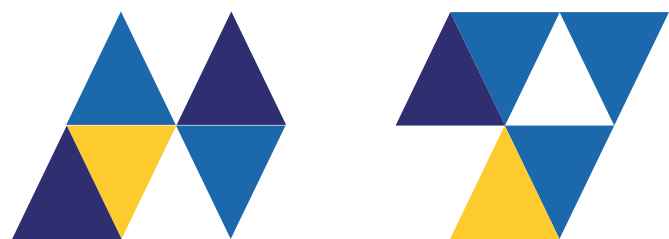
W9: Supertrends SWOT Matrix

*Chair: Montse Monllau | Speakers: Lorena Vegas*

Creating a solution that can help people retain independence in their old age is a fantastic achievement, but it means nothing if that solution does not find its way to the people who need it. As part of the them "Marketing AAL solutions", participants in the "Supertrends SWOT Matrix" session were invited to consider prevailing market trends and how they could be utilised to create better products.

"People first" is a basic motto of human-centred design. Knowing and understanding the needs, pains and gains of people is essential for the successful business development of any AAL solution. This session aimed to give participant's tools to place themselves in their audience's shoes by carrying out marketing analysis and ideation techniques that could help them turn fresh knowledge and possibilities into strategic business decisions.

The session was hosted by Montse Monllau and Lorena Vegas of ESCOOL in Barcelona. Their work involves providing consultancy for brands, startups and healthcare organisations. They are also involved in marketing and communications, with a focus on healthy living and food.

The activity for the session involved looking at 20 global market "supertrends" that are conditioning the outcome of products and services aimed at people over the age of 60. Each participant was given paper and post-it notes, and then had to carry out a SWOT analysis of each trend, by assigning each one as either a strength, a weakness, an opportunity or a threat to their work. The exercise helps people to reflect on their work and to create new ideas for improving their service for the users.

"The aim of the session is to provide the participants with tools that would help them to bring their solutions to market in a more effective way," said Monllau. "By looking at trends that are happening in the world right
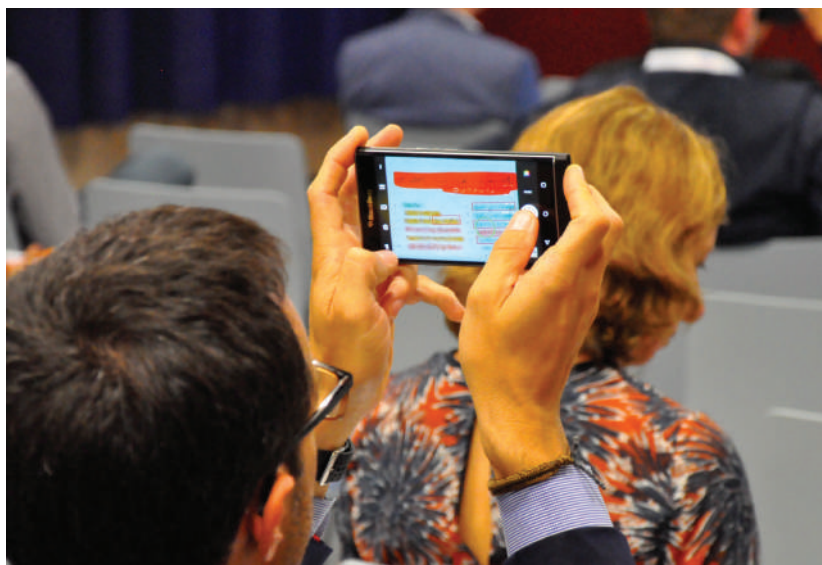
now, it is possible to gain insight into how to develop your marketing strategy to meet the needs of users."

Monllau began the session by referring to Simon Sinek's famous TED talk, which she said had profoundly changed the way she thought about communication. He suggests in it that what matters when trying to communicate and lead is to explain why you are doing something, rather than what you are doing. As he put it: "Martin Luther King's famous speech began with "I have a dream…", not "I have a plan..."".

Monllau highlighted the need to always think of the end user first. "Everything about the product or invention should be thought about from the perspective of the end user. Understanding this and understanding why something matters to them is they key to any successful project. Put yourself in the shoes of the people your product is for, understand their needs, their pains, their difficulties, and then design solutions from there."

One example of the supertrends being explored was the idea of "the angry consumer". Nowadays it is important to carefully consider how communications with the public are carried out. There have been many cases in which poor communication has led to angry backlash from the consumers, especially with rise of social media which has allowed them to organise themselves together effectively.

Participants were then led through a number of other supertrends, including the concepts of freemium products, ageism, big data, and brand-centrism. They left with many new ideas of how to tailor their research into products and solutions that would take into consideration the needs and desires of their target market.

W10: Challenges in matching user needs and ethics issues
Chair: Hilda Tellioglu | Speakers: Anton Zahneisen

Technological developments for informal care are a very important and timely topic. Many and various research projects have been devised to address the design and development of technological aids for the elderly and their close relatives caring for them (their informal carers) and, not surprisingly, pervasive technologies have emerged as strong allies to the task of providing carers with informational, emotional and tangible support, which may help them cope with their inner burden [1]. Despite the benefits that pervasive technologies can provide, current and past research has raised several important ethical considerations about their use, as reported by Zwijsen, Niemeijer [2] and Niemeijer, Frederiks [3]. In addition to that, our experience in the AAL TOPIC project shows that user-centred design approaches should also be confronted with ethics, e.g., when users ask for technologies that can in fact conflict with ethical issues. At this workshop we addressed the ethical issues that may arise from the use of user centred design approaches for the elaboration of pervasive health technologies, with the objective of identifying elements of an ethics roadmap regarding technologies for informal care.

The main output of the workshop was the identification of elements of an ethics roadmap concerning the design, development and deployment of pervasive health technologies to allow future research on the matter to deepen their understanding on such issues. The workshop was seeking answers for questions such as:

• Which types of ethical concerns does pervasive heath technology raise?
• Which types of policies do we need to regulate their use and what are the variables associated to their definition?
• Who should be in charge of deciding whether and how such technologies can be offered in particular settings?
• Is it ethical at all to decide for the users?
• How is UCD (user centred design) supposed to work?
• Should the users not be autonomous in deciding what is good or bad for them?
• How about when what they want affects the others?
• What should be the position of researchers and practitioners who intervene in projects, which are designing and offering pervasive technologies to elderly people?
• How to end the projects without "abandoning" the participants?
• How to ensure a sustainability of the provided technologies after the end of a project?

Six speakers were invited to this workshop. They introduced their opinion based on their current work by including three most relevant papers, showing challenges in matching user needs and ethics issues when designing technologies for informal care. The workshop was started with the initial presentations of the following speakers:

• Nitesh Chawla, Frank M. Freimann Professor of Computer Science and Engineering, Director, iCeNSA
• Martin Kampel, TU Wien / CogVis
• Katja Neureiter, Center for Human-Computer Interaction, University of Salzburg
• Miroslav Sili, AIT Austrian Institute of Technology
• Hilda Tellioğlu, TU Wien, Institute of Design and Assessment of Technology, Multidisciplinary Design Group
• Anton Zahneisen, SOPHIA Franken GmbH & Co. KG

The initial talks, which are included in this report, were followed by the discussion and interactive group work that was organised in two groups, to discuss the following subjects:

- How can ethical issues be adequately addressed within technology-driven research or commercial projects?
- Participatory design framework, user-centred design processes (user needs, protection and appreciation conditions; acceptance criteria for users)
- Engineered software development →risk of discrepancies
- Solution? 1.Discussion between stakeholders, considering two approaches: consequentialist, deontological. 2. Design fiction for ethical computing
- What are the contradictory approaches and conflicting interests to the AAL research and development? How can these be addressed?
- High speed developments driven by AAL funding and research policy
- Business-cases
- Smart home technologies (pervasive, adaptable, connecting, easy-to-configure, …)
- Ethical principles
- Solutions for better social practice?

The results of the group discussions were presented in the last part of the workshop. Some of the discussion points are listed in the following:

- It needs to be distinguished between ethical issues in terms of "how do we conduct studies" and ethical issues that refer more to "ethical consequences" (e.g., the result if we use a certain product). One participant indicated that their organisation particularly invites experts, who provide advice; however including an "ethical board" often causes delays for studies. In this context we also talked about distinguishing between research ethics and ethics in daily practice. Research ethics might be sometimes even stricter than research ethics in daily practice.

- One suggestion was to ask users in terms of ethical issues. However, it needs to be considered that products become more and more complex (Internet of Things) that make it difficult for users to understand the consequences. Hence in this particular context we need new methods and approaches to better understand ethics (see also the example from the talk – design fiction as approach to explore ethics).

- What is ethical "ok" or "not ok" might change throughout the course of a project. This needs to be addressed somehow.
- Needs (and corresponding ethical issues) do not only depend on the user alone but on other stakeholders such as family members or care givers as well.
- Problems might occur when users do not understand the informed consent. We closed our discussion by asking everyone to either indicate an answer to one of the points we discussed or to raise a final question.

Most of the participants raised a question, which are listed below:

- 10 years ago we had testers of a certain system. Now we rather deal with customers. How to deal with this fact?
- We need to identify underlying values/incentives/motivations in order to provide added value for participants. How do we actually assess these underlying needs?
- Added value versus privacy – How can we gain that much user data so that we can run our data interpretation models to detect security issues and provide added value for older adults?
- Who decides what is ethical (if ethics change): end users, experts, ethical boards, the consortium, the scientific community?
- Are we allowed to involve people who are hardly able to give their consent? If yes, how? If no, what about all the dementia projects?
- How do we balance care needs addressed by stakeholders such as family members or caregivers with the privacy needs of the person being cared for?

References

[1] Plaza, I., et al., Mobile applications in an aging society: Status and trends. Journal of Systems and Software, 2011. 84(11): p. 1977-1988.

[2] Zwijsen, S.A., A.R. Niemeijer, and C.M.P.M. Hertogh, Ethics of using assistive technology in the care for community-dwelling elderly people: An overview of the literature. Aging & Mental Health, 2011. 15(4): p. 419-427.

[3] Niemeijer, A.R., et al., Ethical and practical concerns of surveillance technologies in residential care for people with dementia or intellectual disabilities: an overview of the literature. International Psychogeriatrics, 2010. 22 (Special Issue 07): p. 1129-1142.

W11: Creating awareness of AAL technology – Part 1

Chair: Maggie Ellis | Speakers: Clive Noak

Introduction

Dr. Tony Cornford, Associate Professor of Information Systems, London School of Economics

I have a long interest in health IT and so expect a wide-ranging discussion. I believe that key to it all is that professionals need to learn from users. We are dealing with interesting concerns – how do we create awareness in communities around eHealth? I think all this will happen out there, in the home, amongst communities.

Of course, what is motivating this to a large extent in the field of health is the ageing populations and its health needs. But there is a second motivator – and that is that these technologies may make healthcare more efficient, better quality and save money.

PART 1
Educating the users and their families for active assisted living technology, digital services and technology usage

**Peter Wintlev-Jensen,
European Commission Directorate General, Communications Networks, Content and Technology**

Awareness and Skills: A key ingredient for Scaling Up Innovation

There are many different levels of innovation and for them all to come together, we must consider them all, with training and skills development, which are not often not high on the agenda, being key to it all.

We have the solutions so we must have the understanding. Developers, medical associations – all have a common understanding but these need to be organised for the innovation to work in the health sector.

So we need to look at managing the risk of innovation. Business innovation, for example, means making sure investors are on board and business models developed. Product and service innovation means that the fact

Peter Wintlev-Jensen

people need to buy these things needs to be considered very early on.

Training and skills are needed in all. We need to identify the needs and what is required across all these lines and bring them together.

Beyond skills is how to make products more user friendly and here we have to think differently. With innovation, we need to consider general digital skills as Many don't have them, but they need them if they are to use these products. But it is not just the consumers – we need to rethink what skills doctors and nurses and those in social care already have and need. We need to create new job functions and provide all carers, formal and informal, with the digital skills they need to use the new technology and this requires continuous investment.

Public procurers need to be trained as well – they need to know how to make informed decisions about investing in technology.

In summary, training and skills are an important part of scaling up all innovation. And these are not generic skills, but the skills needed must have different characteristics so we need to focus on all the key areas.

Professor Birgit Vosseler,
EFN – European Federation of Nursing
I am a nurse and so represent the voice of the nurse. Nurses in all EU countries are a vital part of the healthcare system. They have good qualifications and good skills – we know this, but these skill are also appropriate for AAL solutions. Nurses work with users, talk about prevention, and work in the community. Trained in public health and chronic disease and all this needs to be part of the AAL package.

Nurses work with families and ensure patients can be in a safe environment. They are there to promote a healthy lifestyle – healthy nutrition, exercise etc. They can identify disease – what people may have, what they can look for in terms of symptoms. All this can be very useful for developing systems, so nurses should be involved at the project stage when ideas are developed for solutions.

ESF for Care is a study with 25 partners, including nurses, and it is focused on developing evidence-based guidelines for nursing and social care on eHealth services. We are looking ate how AAL systems can help nurses in their daily job.

The study looked for countries where systems are in use and the guildelines developed are all based on best practice. It is Important study as it didn't develop anything new – just adopted guidelines on eHealth and social care where they are standard in some EU countries.

One of the forst findings was the importance of mHealth tools for preventing disease. Users can use mHealth for talking with doctors and nurses and this is crucial. Through this, nurses have the opportunity to help people to be more sensitive to symptoms – diabetes as an example. If the blood sugar readings are up, a patient can talk to doctor about what to do.

In all this, there should be an advanced role for nurses – nurses are very important to work with people – they can educate people and use their qualifications to do so.

But nurses are often overlooked and this is a wasted opportunity.

What users want and need
Mrs Hildegard Längle
From Austria, used to be a nurse and now lives in assisted accommodation.

I moved into an assisted living accommodation as it was the best solution for me because my blood sugar was so low and I was unable to call for help when alone.

Why do I use AAL solutions? At first I was scepitcal, but then I got a call from a colleague and she felt some of them sounded very interesting

What AAL solutions do I use? I use health monitoring, a presence sensor lighting for the bathroom, iPad for emails and browsing, automatic blinds and heating.

What do I like about them? I like more or less everything about them. Like to be autonomous and present in the world and very proud that she is able to use the tablet. They are all very convenient for me.

How do they affect her life? My daughter sends me a lot of pictures by email and I stay in touch with family. I feel I am participating more in my life than before thanks to AAL.

What would be better? I am interested in health monitoring – but the solutions need to be 100% reliable and affordable. Also, educating people how to use them is important, with motivations for people to try out new things. It was like that for me with the iPad and now I really love it.

Creation of on-line and off-line resources -
'the chicken and the egg'
Richard Foggie –
Knowledge Transfer Network
Sofía Moreno-Perez –
STOPandGO procurement lead

Richard Foggie
There is a lot of help out there online, but you need to be able to get online to get it. There are many people out there to help, the National Old People's Friends, is a good example. But it's not just the single interest groups who have the ambition to get people to connected. Digital Eagles at Barclays Bank

is another example but they may have a different, more commercial motive.

Whatever the motivation, however, fundamentally this is about digital inclusion. When you are included, a wealth of resources, money saving etc is available to you and this is a great thing and it applies perfectly to eHealth.

Sofía Moreno-Perez
Many resources for senior people to get online were available before the crisis, but these are less prevalent now. One good example is from Vodfone in Spain, where the video training has lessons about how to use the smartphone and also concrete recommendations for seniors to make the most of them:

**http://www.
fundacionvodafoneconlosmayores.com/**

A key message for all this, however, is that the attitude and use of online resources have to be matched to the digital literacy of those being taught. Whatever you are using, though, awareness is the issue – people need to be made aware of the benefits.

PART 2
Creating an appropriate
Business:Consumer marketplace
Dr. Henk Herman Nap, Senior Researcher eHealth, Vilans, The Netherlands

Changing market – business to business to business to consumer.
One of the key points I would like to make is the need to do research with end users and what we see is that long-term care is less dependent on place, so we need to change our networks of support.

Take lifestyle monitoring – the informal carers like this and so here is a shift – there is a shift in technologies. Most were built for intramural care and most located there for long periods of time. Now, with a more consumer focus, we need more meaningful health education about providing the user with the information he or she needs where they need it and when they need it. This is a shift from business to business to business to consumer and it is fundamental to getting it right. In summary:

- Citizens will pay to have their needs met
- Citizens want choice
- Citizens want customer reviews
- Citizens want AT that can be part of life
- Citizens want non-stigmatising AT
- The AT marketplace in professional care is lagging behind AT innovations
- Consumers will decide and keep up to date

Clive Noak, Director, Protelhealth Ltd., UK
Consumer market driving change

We sell eHealth to the consumer – and this is an important business. Why? Because we are all involved in eCommerce. It is a massive part of our ongoing day-to-day life. Citizens have a thirst for the knowledge that health professionals have in their hands. But health professionals are often reluctant to give that knowledge – why? Fear, unawareness of the technology – it needs to change

So what we have is a consumer environment waiting for the information – and a health network that needs to catch up.

The market place is there . . . professionals should wake up to this. There is no point in waiting for the living labs in projects to deliver things – it will be out of date by then. Do it now.

Clive Noak

Maggie Ellis

Meeting the legal and ethical requirements

**Maggie Ellis
Lead Academic, Enterprises, LSE,
Co-ordinator EKTG**

There is a huge lack of ethical certainty and that should be a big worry for all of us. How are people being trained? Are people insured to do the job they are doing or deliver the advice they are delivering? It is no longer acceptable to say that we have been doing the job for years.

In Europe, there are endless directives and guidelines – but lots are not even looked at and we do have legislation about legal and ethical matters as well, both at national and EU wide. But is it used? Probably not.

The health and safety regulations for eHealth are unsure, but they are very important as there are many hidden clauses. We think we may be covered but we may not be.

Take the man fitting your granny's care alarm – is he insured? Probably not. So what happens if he fits the alarm and the house burns down? Are you covered?
So I would advise you to look at your own case . . . it is increasingly important and we need better training, better understanding so you, your employer and users are all happier and safer

Conclusions from the panel
The new ideas – in one sentence

Peter Wintlev-Jensen,
We need to look at skills and training as an integral part of translating projects to a commercial reality.

Professor Birgit Vosseler
We should focus on regional programmes for education, using nurses.

Richard Foggie
There is a real need to get professionals in healthcare up to the level of expertise required to use the new technology

Henk Herman Napp
The consumer market has caught on, so we must link consumer systems with health systems

Clive Noak
If you are involved in projects and looking to price your products, build 40% into your profit margin or you won't make it. You need that money for marketing.

Maggie Ellis
Doctors need to get on board with open access health records. They belong to the patient. So, we need more training and education to become more confident and assured of this.

A word from the chair - Dr Tony Cornford
As we move from one place to the other, we have the once-in-a-lifetime opportunity to reinvent how we do things. We are doing it differently and we need to do things differently. If we do this, we will all benefit and if we don't, we will get locked in to the old way of thinking.

W12: Hackathons: a good tool or just a trend?

Chair: Bart Collet | Speakers: Patrick Vandriessche, Marco Carulli, Wilfried Mbouenda Mbogne, Martina Uhlig

A hackathon is an event in which computer programmers and others involved in software development and hardware development, including graphic designers, interface designers and project managers, collaborate intensively on software projects. The best ideas are selected and supported through several means (training, products, subscriptions, prizes).

The AAL programme sponsored some hackathons in the first half of 2016 to investigate the usefulness and effectiveness of this instrument to fund innovation. The main objective of this session was to discuss with some experts and the winners of the hackathons that AAL sponsored 2016 their impressions on the hackathon as a way to develop new AAL products and ideas. Feedback from hackathons organisers, participants and funders was sought. The session was attended by a wide range of people, the presentations being precise and providing interesting information on different perspectives related to hackathon funding, organisation and participation.

Marco Carulli opened the workshop and presented the aims of the session. Bart Collet presented what a hackathon is, how this instrument can spur innovation, as well as his experience in organising a hackathon. Also, Patrick Vandriessche and Wilfried Mbouenda Mbogne presented their experience in participating in a hackathon, their project ideas having been selected in a hackathon sponsored by AAL in 2016. Martin Uhlig presented the project idea that won the AAL Forum 2016 hackathon, as well as her experience in the event.

The session was very positive in terms of discussions and number of participants. The presentation by Bart Collet was very enlightening, since a lot of information (from the organisers' point of view) was presented to the workshops' participants. Also, the insights given by the hackathons' winners were very interesting in helping to understand the perspective of hackathon participants, as well as the "post-event" activities.

An interesting aspect that cam e out of the discussions was the fact that involving end users in an AAL hackathon is very useful. Also, the business modelling of solutions proposed in an AAL-related hackathon is an aspect that shouldn't be neglected. Specific support (through training or specific sessions) during the hackathon should be organised. Also, the need to have one or several follow up sessions (through the creation of an incubator?) after the hackathon has taken place, to support the most promising solutions, is an aspect which was highlighted during the discussions.

W13: Living labs: a new chance for user-oriented and sustainable AAL innovations?
Chair: Sabina Misoch | Speakers: Alain Thielemans

The FHS St. Gallen is starting a living lab consisting of 20 households and looks to use the SWOT-analysis method to gain new ideas, insights and inspiration on how living labs can help AAL solutions succeed.

Sabina Misoch from FHS St. Gallen, led workshop 13, a session that drew upon the experience of Alain Thielemans, coordinator of Flemish Care Living Lab, and Peter Liemans, expert in IOT and a partner from industry, to complete a comprehensive SWOT-analysis with participants on how living labs can be operated to enhance technology acceptance by end users and facilitate earlier market entrance.

Living labs are in their infancy and have a plethora of potential not just for the issues associated with changing demographic, but for the adoption of technological solutions. Technological innovations rarely enter the market as there is a huge problem with the acceptance of these solutions, and so living labs are seen as a beacon of light to work on this issues by testing innovations with end users at an early stage and using co-creating to develop the innovations are really needed for the elderly in the long run.

Thielemans, with over two and half years' experience working with Flemish Care Living Lab to offer innovations for older adults and learn how to improve social interactions and the mobility of care givers in neighbourhoods, shared with workshop participants his experience with setting up and running living labs, and he admits it was not an easy ride.

The first challenge came when recruiting users and care givers to test the new homes, as you not only need a group that is willing to accept the prototype technology, but also you need to find within that a representative group, for example over 65 and frail, over 75 and independent. The second challenge was the underestimated time it took to organise and manage the large number of partners and stakeholders and ensure they shared the same vision. The final challenge was establishing the business models for the different partners after the three years of funding was up. However, the involvement of all the stakeholders and local governments, proved instrumental to the success of the platform.

From Liemans point-of-view, whose experience comes from working at an IOT technology company, living labs help develop the right technological solutions for the changing demographic, and quickly. Living labs give Lieman access to user groups, support and expertise from academics and field experts, and test products in a real-world setting.

To conclude the workshop, Misoch led participants through a SWOT-analysis to understand what they saw as the strengths, weaknesses, opportunities and threats are of living labs. In groups, overall, participants saw a great potential in the use of living labs to both inspire older adults to use AAL technology but also for the fast deployment of technological solutions in real life environments. Although difficulties arise when it comes to users distrusting the devices and dropping out, and in important matters of data misuse, the opportunities living labs offer, with regards to research and carer-patient relationships, are inspiring for the success for future AAL solutions.

W14: Key avenues and challenges for supporting elderly occupation

Chair: Pierre Rossel | Speakers: Djamel Khadraoui

Workshop 14 was coordinated by the SpONSOR consortium team and gathered mostly projects and lessons linked to AAL Call 6. It proposed to guest presenters wishing to contribute to the overall topic, within the planned 90 minutes session: Encouraging, supporting and maintaining dynamic lines of occupational conditions, for the senior population, in particular anything close to working options, require creative settings, involving all stakeholders, as well as sustainable means (tools, methods, services, expertise, institutional framework, etc.). The session aimed to show some solutions (combining both the ICT level and the organisational schemes, including business plans) and discuss them within a pitfall-avoidance and best-practise promotion perspective.

Within the workshop, the following projects were presented:
Project Time to share, presented by Dr. Martijn Vastenburg, from Connectedcare.nl:
Time to share is a platform providing match-making options to seniors on the one hand and to companies on the other hand. Those companies, mostly SME type, are asked to post their needs, hopefully matching the profiles posted by seniors that are built on skills and experience acquired all along their life, within a clear volunteer arena focus.
Project Well-being, presented by Michael Brandstotter, from CogVis:

Well-being aims at remediating to what can be considered as an abnormal situation, touching almost every worker, including of course young seniors in their years before retirement, namely working for 8 hours/day or more, in "not ergonomically designed" workplaces, with malnutrition issues and little or no exercising. Thereupon, the project aims at fighting chronical problems such as back pain, stress and burn-out, with their corresponding negative effects, by detecting stress, postural and nutrition problems, and

by gaming and retraining seniors towards more healthy ways of behaving.

Project ActGo-Gate, presented by Stefan Kleinschmidt, from the University of St-Gallen, Institute of Information Management:

ActGO-Gate's objective is the development of an IT-based marketplace for volunteering work, envisaging a positive pathway to work upon combining active work and occupational leisure to support transition to retirement, from paid jobs to volunteering ones, thereupon maintaining sense of and quality of life, including such essential steps as the passage to self-entrepreneurship and social work. The targeted on-line marketplace the project aims at achieving should help seniors to find an occupation thanks to a profile-based match-making mechanism.

Project Fit4Work, presented by Michał Kosiedowski, from Poznań Supercomputing and Networking Center:
Fit4Work targets the Prevention of health-related absence of older workers, mainly through stress prevention, envisaged as a cross-road of indications to detect(through ambient sensors) and work upon in due time (thanks to specific recommendations), between stress signals (six parameters surveilled), the characteristics of the working environment (5 parameters taken care of) and the physical condition of the seniors under scrutiny (with a template of average needs to comply with).

Project SpONSOR, presented by Djamel Khadraoui, from Luxembourg Institute of Science and Technology (LIST), Rodd Bond, from Netwell Casala and Pierre Rossel, from Coherent Streams Sàrl:
SpONSOR aims at facilitating the access to and the maintenance in, occupational possibilities for seniors, through a platform of services mainly targetted at supporting the means senior-concerned organisations may help provide meaningful occupations to seniors. Presenters showed 1) how the platform was conceived and expected to deliver its benefits, 2) how the project could become perennial on the market, thanks to properly adressing the volunteer organisations' needs and their most likely supportive territorial bodies (cities and regions), and 3) how future extensions for the platform's objectives could also adress other pathways to senior occupation, beyond the volunteer focus.

Lessons learned
The goal of showing the diversity of solutions which are emerging across Europe on how to facilitate senior occupation to take place was clearly attained as the presenters displayed indeed a variety of styles, approaches, concerns and audiences.

Basically, two kinds of broad concerns emerged from these presentations, with on the one hand projects aiming at relieving the hardship of seniors and maintaining good working conditions while seniors are still at work (Well Being and Fit4Work), and on the other hand, projects trying to help seniors get access to new occupations after their professional life or as a transition (Time to share, ActGO-Gate and SpONSOR). In this latter category, some problems linked to supporting occupational options, capacities and contexts regarding senior activity, which SpONSOR, as a project, tried to tackle, were left barely touched by others. In particular, this covers all aspects linked to the difficulty of going beyond the mere putting together of a profile-oriented service platform and the mechanics of match- making between seniors wishing to offer competences and availability to others (the market, associations) and possible actuators of such offer in real need conditions, and this left the SpONSOR group a bit short of interaction and lessons from others. The SpONSOR project had already examined other proposals (competence-seniors.com and retiredbutable.com, among others), identifying this problem and most of the efforts engaged in the project had to do with finding ways of overcoming it and truly offering solutions to seniors and also organisations taking care of seniors. The workshop, on the basis of the presentations as well as the final discussion (some 30 people have been attending), left little options to discuss such matters (see below, the section: "key issues"), and therefore no proposals beyond those already explored by SpONSOR really emerged. However, it did allow for different tactics and experiments to be part of the options displayed and that variety became the asset of the workshop, which we should consider as a starting point rather than a relevant pivotal progress into the occupational support challenge.

The following issues have been part of the SpONSOR project since the beginning (for most of them) and were mentioned by several of the workshop' s presenters, but with very little time to really discuss them:

- Addressing individuals or primarily organisations' capacities and individuals as subsidiary options: this was a decisive choice, after examining what others had done in terms of job- seeking match-making platforms and analysing their low performance and success rate. This included organisations (mostly associations) dedicated to senior occupation as well as organisation claiming a different mission, but envisaging in a positive way the involvement of seniors. Of course, individuals seniors, not particularly affiliated with an already existing association, are taken care of just the same.
- Match-making: A non-trivial issue. Match-making seems simple, with on the one hand people offering time and competence to the "market" (including of course the volunteer arena) through a profiling filter, and on the other hand, thanks to somehow more tricky sourcing mechanisms, the needs that organisations, private, public or NGO type, may have which the senior proposals may satisfy. In fact, this looks more like a Tetris game (i.e.,: with only fit or no fit answer) and rarely covers all the subtleties and options which the effective effort to help both sides meet and maintain an interaction agreement over time until satisfaction, really involves. PIC, PIT and DPM functions, as explained further, aim at addressing this difficulty.
- PIC: The Proactive Information Curation approach considers that before proposing forms to be filled up (for profiles) and requesting registering, there is a need to motivate visitors, show the extent of activities either already involved or possibly accessible, with inspiring stories and flexibles scenarios, as a pre-requirement, hopefully capable of displaying relevant local information to help postulating seniors to find their best way to present themselves or to look for specific associative occupations.
- PIT: Nothing more frustrating than the posting of an offer in competence and time and either get a no match response or encounter a fuzzy time delay in eventually getting a message from an organisation to which one sent an offer. Personalised interaction over time covers all the handshakes that can make this relationship polite, substantial and personalised, even if partially automated, with a variety of outcomes and steps taken care of along the way.
- DPM: The concept of "Dynamic Profile Management" means that 1) seniors may not fully realize what they are capable of offering and may welcome suggestions (including regarding additional training) to improve either their explicit potential or their fit with a specific organisation's needs; 2) the organisation may have evolving needs or several open positions which may be discussed, generating negotiations of profiles and options, and 3) the seniors' physical and cognitive condition (or other factors in their life) may evolve, making necessary updates or new solutions to be considered within the interaction. SpONSOR aims at facilitating this dynamic profile management for organisations wishing to improve their CRM and HRM, which is not too often the case in the volunteering world.
- Capacities for organisations to interact with other ones with similar goals: this user requirement has appeared in the preliminary inquiry,

as a means to extend collaborations among organisations and in a duly controlled manner, being able to exchange information on profile posting candidates, in our case, seniors or organisations supporting senior occupation.

- Other supportive hands: SpONSOR found useful to dig and provide ample information on working legislations, country by country (with a specific search engine), which may be essential to know when engaging in a specific occupational activity.

- The main sustainable business line: proposing a marketing scenario to create or support a productive organisation wishing to take up the solution and developing it to further capacities in time, with clear indications regarding business metrics and players projection to make of the volunteering collective workforce a superior contribution to society at local or even at a more global level.

Conclusions

Among SpONSOR consortium members, the feeling, after the workshop, was that we had only touched and started to instil in the AAL arena most of the above-mentioned problems and that the discussion should continue, for us and other colleagues from other projects or contexts similarly inclined to continue this pragmatic discussion, in a way that has still to be defined. Hopefully, the SpONSOR capacity will gradually extend to other issues than volunteers and volunteer organisations and converge with other presenters' concerns, as a pathway to expand the scope of interest and mobilisation of the different players working on senior occupational issues. The SpONSOR website as well as other or new organisations's websites targeted to be part of this continuation will serve as convoking platforms. The story goes on, the problem to be tackled, supporting elderly' capacity to engage in a meaningful occupation of one sort or another is so huge that the important point is mainly not to let the ongoing experiments and lessons to fade away and on the contrary to be capitalised and enhanced upon with new inputs as time passes.

W15: Suddenly she knew...

Chair: Rolf Kistler | Speakers: Ralph Eichenberger

We all like good stories and this session was about the importance of telling successful stories in AAL. It begins already when you are searching for partners for your AAL project idea and it continues when you lead a consortium to a successful project or explain the project to your end-users to motivate them to take part in a field-trial. But most importantly, it helps you in the product design and when you finally want to sell it to an investor or your potential customer. However, telling a good story is a discipline for itself and not easy in many respects.

The workshop kicked off with a short introduction from Rolf Kistler about how stories are so important to products, and explained some of the existing theories about what makes a good story. He then shared a number of examples of existing AAL projects and initiatives that have successfully used storytelling to great effect in different phases of their work

Ralph Eichenberger, a designer and storytelling expert, then gave a talk about his experiences in telling stories and designing prototypes and products for older people.

The workshop then turned into a World Café, with participants working with others on their table to develop their storytelling prowess and discuss their own work in the context of what they had heard. The experts were available to help everyone out with developing the way they thought about their own projects.

Participants in the workshop went away with a better understanding of what storytelling is and why it is important, especially in the context of AAL and in marketing its objectives and results. They learnt about the characteristics of a good told story, what elements it contains and how they are linked to create the needed dramaturgy

Hopefully, participants gained the motivation to use storytelling techniques in their work and to see how it can help them to shape their ideas or projects to become a successful product story in the end.

W16: Neighbourhoods of the future- Alternative financing

Chair: Ian Spero | Speakers: Dawid Konotey–Ahulu

The housing market is having trouble keeping up with demographic change; at present, 75 per cent of European housing stock is not considered to be age friendly. The EC and AAL have invested in numerous research projects to address this challenge. The many innovative solutions emerging are however faced with major barriers when meeting fragmented market forces and the muddled complexities of everyday life. It is therefore time to join forces across Europe to elaborate a demand-led paradigm for digitally enriched built environments that can provide clear return on investment by supporting active and independent living.

Dawid Konotey–Ahulu

Neighbourhoods of the Future has been bringing together a variety of influential stakeholders from the digital, construction, health/social care, finance, security and 3rd sectors to discuss the development of innovative new-build and retrofit home environments specifically designed to empower the ageing population to live more meaningful, connected lives.

It is estimated that around 75 per cent of the EU's current housing stock is not suitable for independent living, while only some new-build housing schemes are embracing the concept of smart homes. This provides a huge opportunity for the development of new and retrofit solutions. The AAL Forum, of course, is a natural home for this important discussion topic, with smart homes a key enabling factor in much of the technology being developed by AAL projects and the Internet of Things being at the core of much of the AAL's current thinking.

Over the past decade AAL has invested more than 400 million Euros to initiate ICT-based solutions which support older adults in their daily life. So far only a few of projects have found their way on to the market and none has had a major impact.

The Neighbourhoods of the Future addressed various questions, including: are the products and services not good enough? Do AAL projects need to initiate better business concepts and marketing techniques? Are older adults actually ready to engage in new digitally-enabled products and services? A distinguished panel of experts then went on to discuss all factors contributing towards innovative solutions that will promote growth in the construction of smarter age friendly homes and environments.

Short presentations were given from a number of different angles. Arup's representative Simon Butler spoke about the work the company has been doing to create age-friendly environments for older people. He talked about public spending on infrastructure in the urban environment, and how the needs of older people are diverse.

Other talks from David Konotey-Ahulu of Redington Finance Limited, Lindo Deambrosi of the Swiss Senior Council, and Philippe Osl of Independent Living gave a broader picture of the situation faced by Europe. Ian Spero and Urs Guggenbühl hosted the session and created an open forum in which ideas were exchanged and discussed.

W17: Creating awareness of AAL technology – Part 2
Chair: Maggie Ellis | Speakers: Ron Summers

Tony Cornford

For AAL products and services to be successful in the real world we need to create a real awareness of their potential amongst those making decisions about support and care for older people as well as older people themselves. The "Creating awareness of AAL technology" sessions explored how we can create this awareness, provide assistance and educate all the relevant stakeholders about the benefits of AAL solutions.

It has been recognised for some time that because of increasing financial stringency the statutory bodies in each European country will have to reduce the level of financial support and resources they can dedicate to the health and care of their ageing citizens. As a consequence there is now an accelerating need to create sharper awareness and educate citizens in AAL technology, digital services and open access to records.

Policy makers and employer's responsibilities for the workforce include development of content in educational courses or academic curricula, specific opportunities for users, industry, and professionals. These should contribute to CPD Certification, specific qualification and highly improved services and

application of funding. Two sessions entitled "Creating awareness of AAL technology" were organised by EKTG (European Knowledge Tree Group) at the 2016 AAL Forum to highlight cost-effective education systems and their application.

The second session began with a talk from Birgit Vosseler, director of nursing at FHS ST.Gallen who spoke briefly about the European Federation of Nurses' eight competencies that help define what nurses should do every day. At FHS St.Gallen the development of a living lab will enable nurses to teach patients and patients to teach nurses, ensuring AAL systems and services are better developed and deployed for the benefit of all.

Dr Christiane Brockes, leader of clinical telemedicine at the University Hospital of Zurich has taken the delivery of eHealth to a new level through the organisation of a medical online consultation service, including services for patients with heart failure and long independent living assistants. Education in clinical Telemedicine and eHealth is embedded in the curriculum of medical students at the University of Zurich, through the delivery of 20 hours of learning over a six-month period. The students' response has been extremely positive.

Tony Cornford of LSE believes it should be possible to have a positive intervention when supporting people in the adoption and use of AAL services by incrementally building people's skills and competencies – not forcing an unnatural change or driving forward any specific 'project'. Training should not be the principle goal on the basis that the more training you give the worse the outcome. This positive intervention could be done by drawing good practice from models found elsewhere. In doing this we must be cognisant of existing education and training systems.

Maggie Ellis of LSE finished the session with a short talk on identifying legal and ethical requirements for assistive living technology innovations in specific countries. This is essential and should always include both the workforce and the user. Certification, qualifications and methods for audit of knowledge should equally be part of this as much as providing knowledge and understanding. Checklists can easily be provided to facilitate comprehensive coverage of the issues, not forgetting that individual country requirements can vary tremendously.

A summary of issues and actions identified during the session will be created that will act as a basis for a report that will be shared with AAL Forum, EU Officials and others at both national and individual levels.

W18: Back to the future – Visions for age-friendly communities in 2030 and beyond
Chair: Markus Garschall | Speakers: Katja Neureiter

As we look towards the future, one thing is certain – our population will continue to get older. AAL can play a pivotal role in helping define areas of need, but can also provide a platform for visionary innovation. We live in rapidly changing times, where disruptive technologies like the Internet of Things, augmented reality, robotics and smart cities and devices are changing the way the world work. But how exactly will the future of health and care look in fifteen years time and beyond?

Advances of technology are steadily increasing and pervade all different areas of our lives, including work, leisure and care. Whereas the 1980s can be described as the era of personal computing, nowadays computer are embedded in a variety of materials and artefacts. Beyond the keyboard and mouse, new ways of interacting with computers have emerged, such as mobile, affective, tactile, and social computing.

The workshop entitled "Back to the future – Visions for age-friendly computers in 20130 and beyond" aimed to discuss future visions based on current trends in the field of human computer interaction e.g. social computing, tangible computing. Markus Garschall, a researcher at the Austrian Institute of Technology, introduced the concept of the session, which was to explore what being old might be like fifteen years from now and beyond. He asked everyone to keep this in mind throughout the session and to think about how they could apply this to solutions for future informal care and age friendly communities.

The main goal of the session was to develop ideas for at least three concrete solutions and answer a number of questions including: What can we learn from technology visions from the past? To what extend can novel human-computer interaction techniques contribute to the design of future AAL solutions? What are future visions beyond smart cities and smart homes? What new approaches can be enabled by advances in artificial intelligence?

The workshop began by looking back at technology visions from the past and by providing an overview on current and emerging trends in human computer interaction. It was interesting to look at how visions from the past differed from each other, with some of them proving to be quite accurate while others were wildly off the mark. Some, like the idea of a postman delivering letters door to door sitting on his own personal aeroplane, seemed ridiculous at first, but when you think about Amazon's recent pledge to start delivering parcels using drones it suddenly seems not that far from reality.

In order to try and encourage thinking about design of AAL products beyond "solutionism", participants were then asked to engage with fictional stories describing imaginary care scenarios. They were then asked to come up with "alternate endings", describing how ICT-based interventions will have improved (or worsened) the quality of care in specific scenarios in 2030 and/or 2050.

It was an interesting exercise that captured the participants' imagination. "It really made me think about the huge possibilities that are available to us when developing new products," said one delegate. "Thinking about how the Internet of Things can connect everything we do together into one ecosystem is mind boggling! But I think that by harnessing this power we can really transform the way we think about care."

W19: How can regions get AAL operational?

Chair: Kurt Majcen | Speakers: Mike Dorst, Cornelia Schneider, Lukas Roedl, Raquel Sousa

Kurt Majcen (JOANNEUM RESEARCH; www.joanneum.at)

Active and Assisted Living (AAL) has been on the European agenda for more than ten years. The European AAL Joint Programme has released seven calls and 154 transnational innovation projects with more than 1,000 partners having been funded. A lot of technologies were developed in those projects so far, and many pilots were executed and discussions were held around bringing AAL to the market and what the business models for that purposes could be.

Besides the European funding programme, national initiatives like the Austrian benefit programme exist which try to foster research and development for assistance systems for older adults. The benefit programme is funding so called AAL test regions. Already four of them have been initiated. The aim of these regions is to study the use of AAL technologies in larger test groups and over longer periods than usually possible in R&D projects and to disseminate information on AAL and its usefulness in those regions. Further international awareness for AAL is raised through the AAL forum which is yearly held in varying locations around Europe.

Decision makers still cannot exactly see the benefits and how to scale up concrete implementations. Moreover some countries like Germany or Sweden already resigned their participation in the common programme to find other ways for bringing AAL technologies to the market. Therefore a step by step approach over the next years shall allow greater success in bringing appropriate assistance to the people.

Mike Dorst (Dorst en Partners; www.dorstenpartners.nl)

Is working with a private company an opportunity or a threat? Public care companies usually focus on their primary processes and are supply driven. Doing so and due to the changing demography with shrinking budgets they have difficulties in changing themselves and their processes. On the other hand private companies (SME) try to focus on client wishes and are demand-driven. They focus on the results (profit).

Some differences were spotted between the "young" and the "old". Technology in general is seen as second nature for the young who grow up with it while the older people look at technology with distrust and often experience it as new and unknown. When technical problems appear, the young take them for granted and bypass them in some way. For the old it may stop them from using it. The same appears for usability –it leads to drop outs for older people whereas the young don't see real problems. Finally, older adults want to have an added value to daily life and some empowerment whereas young people often just play around to figure out what's going to happen. When it comes to the scaling of successful test or pilot regions, it was made clear that it should be large enough to have a comparison, whilst on the other hand it needs to be small enough so that sufficient attention can be given to all involved users.

Finally what are the needs of private care companies and what are their expectations of AAL? They want to see a real demand for the end product. Commitment of the stakeholders (care companies, professionals, funders) should be 100 per cent to fulfil the wishes of the end users.

Cornelia Schneider (Salzburg Research; www.salzburgresearch.at)

An AAL region is operated in the central Austrian area Salzburg. The target group consists of about 60 younger seniors (60 – 79 years) with little or no need for support. Their households are equipped with AAL services (i.e. ICT-enhanced solutions and services for ageing well). The project is centred on "comfort" but the term itself is interpreted differently: instead of taking away older people's responsibility for their lives they will be empowered thus being able to deal with simple activities themselves. As a consequence, they should maintain or even improve functional abilities which helps them living an independent live, and hopefully care demand will be reduce or delayed.

The project gave the possibility to present AAL products and services to a wider audience (older people, friends and relatives). Via a living lab technologies can be demonstrated. Instead of testing individual components, an overall system can be used and evaluated even with the comparison of a test and a control group. The expectation is also to get recommendations for decision makers.

Lukas Roedl (Austrian Institute of Technology; www.ait.ac.at)

The project ModulAAR was an AAL test region project with 50 assisted flats in the most eastern part of Austria (Burgenland) equipped with modular and standard compliant AAL technology. There were households with new installations and others with retrofitting. A scientific evaluation of the used technologies dealt with user acceptance, usability, benefit as well as the user acceptance of the care provider personnel. The aim was to realise a reference implementation in a whole region, to publish the outcomes to the public and to create an economic model for further use and exploitation of the system.

The main lessons learned were that systems have to be configurable or adjustable to personal needs. Using standard hardware with simple user interfaces makes life easier for the support team in several ways. Training people how to use the technology at the very beginning is crucial and potential users should be technology oriented.

Raquel Sousa (IncreaseTime; www.itime.pt)

The product family KeepCare® with components for health professionals, for elderly and some mobile communication facilities for patients and their caregivers was piloted in a nine-month test phase to cover several scenarios and collect feedback from the two main users of AAL solutions – caregivers and patients.

Some barriers were found: it's not easy to convince health professionals to integrate AAL solutions in their daily routines unless they can understand that there is an added value (i.e. they have to understand how the solution will contribute in increasing efficiency and quality of their services). Today's elderly have not grown up surrounded by technologies. So it is not that easy for them to trust and agree that these solutions are the future and are there to help them. This may change over time and it is expected that in around 10 years these AAL solutions will be easily adopted by older people, when they are more familiar with technologies and will know about the possibilities they offer in their daily life management.

One aspect is common to both health professionals and older adults: usability. Older people are not familiar with technologies and health professionals do not have or want to spend time on figuring out how systems works. The answer is keeping UIs simple.

Several aspects were seen as success factors. Older people should understand that solutions will contribute to keeping them secure. It is important for them to know that if something goes wrong, they will be quickly assisted. The use of passive technologies is more acceptable by older people because there is no need to interact with them. Relatives and caregivers shall be involved from the beginning as older people will feel more comfortable when knowing that someone from their trusted network is also involved with the system. Human interaction is a vital need rather than speaking with a machine or receiving orders from them, even if it was a recorded video or voice of a real person.

World Cafés.

In three world cafés, approximately 20 participants collected a list of relevant aspects of how AAL technologies may become more successful. Below is a summary of their thoughts on three open-ended questions.

"Is it still a matter of technology? What is missing?"
• Organisation of players and coordination
• Too many offers (and not organised)
• Usability (user interfaces) often still a topic
• Integrated solutions necessary
• Personalised solutions based on the real needs of the patients (respectively clients)
• No one-size-fits-all solutions
• Intelligent learning systems
• Public administration interest by regions to promote an integrated solutions in their site

"What can (economically driven) bottom-up approaches look like? What are the stimulators?"
• Small solutions not always focus on a holistic approach
• A single solution shall be reliable
• Evidence for functionalities is needed when being recommended to care institutions
• Projects shall be demand driven

• A single point of contact on regional level for information and testing of AAL products
• Involve SMEs right from the beginning of projects
• Dual jobs partly in an SME and in a care organisation

"How can we achieve representative samples in piloting projects and who is going to pay for that?"
• Samples
  o aim at statistical relevance rather than representativeness
  o What do we want to know? This question influences the sample size (30, 50, 70, 100 …)
  o Qualitative vs quantitative research -> question of funding; in AAL projects qualitative than if a company is interested they should do long-term evaluation because they will benefit later

• End Users and recruitment
  o If not the end user benefits than the caregiver benefits so he/she has to be convinced
  o It takes time to convince end users – more than one meeting is needed – maybe also incentives
  o One end user organisation is often not enough – another organisation might be a competitor
  o Pilot can help you to find out about the different benefits (end-users, carers, municipalities…)

• Payment
  o If a product is not proofed - pilot should be funded by a funded project - afterwards if a company is interested they should do long-term evaluation because they will benefit later
  o After the pilot (parties that benefit) are: care companies, insurance companies, end users

W20: A startup accelerator for the AAL Programme?
Chair: Michał Kosiedowski | Speakers: Paul Pelsmaeker, Arto Wallin, Piotr Pawałowski

As an organization experienced in both programmes – FIWARE and AAL – we looked to understand how the two initiatives can learn from each other. The Future Internet Services Department of Poznań Supercomputing and Networking Center has gone down the road of successfully commercialising a collaboration platform for healthcare – medVC. This solution started as a research result of an international project implemented within the Celtic initiative, and further was incubated into a startup through the FICHe accelerator within the FIWARE programme. Currently, we are implementing an AAL Programme project – Fit4Work, and are looking to understand how we could pursue a market success similar to medVC.

In this session we were able to confirm that the majority of the AAL community agrees with our point that it is difficult to focus on ambitious goals of the R&D project and at the same time create a fully marketable product. The community suggests we might be in need of further support, specifically an accelerator enabling highly innovative and promising AAL products, or other post-project services allowing to transfer the R&D prototypes into a final product.

Following the workshop, discussions have been held with participation of AAL Programme officers and experts in bringing healthcare innovation to the market, including those related to past and ongoing startup accelerators. Its topics were related to collaboration around the possibility of fostering acceleration of AAL products.

The following results of the survey can be presented (survey questionnaire attached).

Participants of AAL Programme project:
- 85% of respondents thought that combination of project results (prototype) verified against end user needs, envisaged business model and AAL2Business services was NOT enough to successfully attempt post-project commercialization
- 85% of respondents thought that a dedicated AAL startup accelerator WAS needed
- 100% of those suggesting that an AAL startup accelerator should be created thought that it should be enabled for results of projects implemented in various R+D programmes (that is NOT ONLY for AAL Programme project results)

Overall:
- 90% of respondents thought that a dedicated AAL startup accelerator WAS needed
- 89% of those suggesting that an AAL startup accelerator should be created thought that it should be enabled for results of projects implemented in various R+D programmes (that is NOT ONLY for AAL Programme project results)

Activities suggested to be added on top of the current support provided by the AAL Programme were:
- During project implementation and/or after project termination:
- validating business with customers (in addition to the prototype validation with the end users)
- more focused support of the development of the business resulting from the application of the project results.
- After the project termination:
- advise in IPR management
- support in finding investors, including for further development of the prototypes achieved at the end of the project
- coaching in market know-how and attracting investors
- accelerating most promising products

W21: Implementation and upscaling of AAL solutions

Chair: Henk Herman Nap | Speakers: Johan van der Leeuw

Introduction

The implementation and upscaling of AAL services and technologies for older people is still limited across Europe due to – among other things - structural financing possibilities, laws and legislations, and a lack of uptake and acceptance among care professionals. The goal of this session was to present and discuss the experiences with a variety of implementation strategies and financing possibilities in various European countries countries: The Netherlands, Switzerland, and the UK.

The aim was to identify the main factors for a successful implementation and upscaling process and discuss:

- The pros of cons of the business model 'business-consumer, consumer to business': selling the core of the system directly to the end user, with a smaller component to be bought by care organisations. Furthermore, the 'business-to-business-to-consumer' model was discussed: selling the complete system to a care organisation, with the core in a lease/rent construction towards end users.
- The instrument 'Health Impact Bond', an instrument for upscaling of innovations, including technical innovations.
- The role of technology acceptance in the implementation and upscaling of AAL technologies and services.

And number of presentations focused on best practices and among others things, a discussion about the implementation, upscaling and business models for Lifestyle monitoring, e.g., Sensara (follow up of AAL-call 1 project Rosetta) also took place. This is an example of the business-to-consumer, consumer-to-business approach. In the presentation of Johan van der Leeuw a discussion about the possible role of the Health Impact Bond in upscaling was put forward.

eHealth Successes and 'Failures': Turning hindsight into Foresight
Dr. Henk Herman Nap – Team eHealth, Vilans

Vilans is a centre of expertise for long-term care, with a focus on improving quality of care for the chronically ill, vulnerable older people, and people with disabilities

The centre involves professionals and managers, insurers and municipalities and provides innovation, research and development (H2020, VWS, AAL). Involved in this innovation chain, the centre is involved in dissemination of (established) good practices and the implementation of solutions.

In terms of eHealth, there are several key notions to examine, the most important being that there is still a huge amount of work to do and a massive opportunity to be exploited. We have only just scratched the surface. There are some key issues to consider here:
- Adopting eHealth has more to do with workflow integration and payment models.
- The majority of health tech applications and platforms are narrowly defined, purpose-built to address a single disease state or deliver a single class of interventions.
- Doctors don't have the bandwidth to manage multiple, dedicated solutions.

Another key focus needs to be on the business modelling for any eHealth application. There are many technologies – restorative environments, training games, social platforms, TV platforms, social robots to name just a few – but who will pay for these? It is important to work with this organisations who will pay. How they monetise the solutions, through licencing, rentals etc, is for them to model.

In summary, this session finished with some key take aways:
- Be more honest in dissemination
- Share failures and successes
- Get the whole picture
- Understand the difference between research and marketing a product
- Look at eHealth now and can we make it better?
- Start out with abilities and opportunities for the aging population
- Focus on care and wellbeing, know where the money goes

Upscaling mobile apps for the elderly market
Frederic Ehrler, PhD
University Hospitals of Geneva

There is a massive increase in the adoption of technology amongst all the population, but also in the senior market. This market of the

older adult is a promising one for those producing mobile apps. New Michigan State University research has found that the use of tablets does make it easier, breaking down some of the barriers that keep seniors from getting connected.

And the market is catching up. There is an increasing number of apps developed specifically for older adults, varying from those that enable people to remain connected to family and friends, health monitoring apps and general fitness and wellbeing programmes for those who enjoy a more active ageing. Of the apps used most by older people, the following are the most popular:
- iBooks (free)
- Words With Friends (free).
- NPR (free)
- Netflix (free)
- Luminosity Brain Trainer (free)
- AllRecipes (free)
- The Weather Channel (free)
- Well Being Plus (free)
- MedWatcher (free)
- Medisafe
- Virtual Pillbox
- Red Panic Button ($1.99)
- Find my iPad (free)

It is important to remember that the elderly are part of a large and growing ecosystem that includes institutions, communities, friends and family and, of course, the individual himself or herself.

In terms of business modelling, it is important to keep in mind this building block of networks to make it effective. In order to optimise operations and reduce risks of a business model, organisations usually cultivate buyer-supplier relationships so they can focus on their core activity. In the world of the app, this means:
- Press release distribution services
- Translators & country- expert designers
- Satisfied customers (good ratings)

Marketing is key. Building a great product isn't enough to make the app the next Angry Birds. In order to create a sustainable app, you need to build in solid marketing and distribution strategies to get it into the hands of the people who need it most.

Marketing to seniors involves establishing a relationship, building trust and providing opportunities for growth, learning and interaction. Seniors are known for developing long-term brand loyalty, so an honest and forthright approach is vital to reaching this important segment of the population.

It is important to coordinate this marketing activity with the distribution of any new app and this should follow careful research into your market to determine where the majority of your senior population resides

It is important to develop advertising vehicles that are most likely to reach these seniors directly or though their family and friends and to create marketing avenues that invite seniors to participate, learn and meet new people. In other words, go where seniors go, make it easy for them to use and learn and make it personal – add a personal service.

Communication channel selection should related to the education, age, income, and living arrangements of the target audience. Elderly people who did not complete high school are less inclined to select any of the channels. Age is also a factor, especially if the individual is over 80 years old and, meanwhile, individuals living alone are less likely to be reached through newspapers and organsations.

Once the market is established and a clear revenue stream identified, it is also important to know how the app will be sold, because there are several possibilities. These include selling the app to someone else – a market leader with established market presence, licensing the app or selling it directly to your target users.

All have their merits. If selling to a market player, you will need established numbers of users, target users and recommendations online thoriugh social media to maximise your sale price. Selling directly to the market is harder, and you will need to compare your app to similar services already on the market. Returns are potentially greater, however.

And you will need good returns. Developing an app from scratch and then marketing it and commercialising it will cost – on average around €200,000. There are hidden costs, too. The industry norm for software maintenance is about 15 to 20 per cent of the original development costs. So if your app cost €100,000 to build, roundly estimate to pay about €20,000 per year to maintain the app. Then factor in app developer costs, selling costs and update costs for new devices.

W22: Neighbourhoods of the future - What is possible?
Chair: Michelle Hawkins | Speakers: Simon Butler

The housing market is struggling to keep up with demographic change; at present, 75 per cent of European housing stock is not considered to be age friendly. The "Neighbourhoods of the future" theme provided delegates with a forum to discuss the issues surrounding homes for older adults.

How can we leverage the maximum economic and social benefit from new technologies in the home? The second "Neighbourhoods of the future" interactive session provided delegates with an opportunity to participate in an analysis, consultation and discussion covering all factors contributing towards innovative solutions that promote growth in the construction of smarter age-friendly homes and environments. Innovative practices were discussed, and attendees were able to contribute towards a European Reference Framework for age-friendly housing.

The AAL Forum showcases a lot of amazing technology but can sometimes fail to show the human aspect of the products, said Michelle Hawkins-Collins, head of futures at Virgin Care UK. Why do people need this technology and why will it make them happier? When we think about products for the home, it shouldn't be because it is cheaper for people to stay at home, but because it can keep people happy. If this is kept in mind, the right products and services can be designed.

Poor quality housing can be as much of a killer as smoking, she said, with the UK spending £4.6m a day on falls in the home. Dementia at home is also very tricky issue – it is not useful to change the environment of someone suffering from dementia.

We should take into consideration that people are pleasure-driven. Hawkins-Collins briefly mentioned the concept of the hedonic treadmill – the tendency of humans to return to a relatively stable level of happiness despite major positive or negative events or life changes. How can we design houses to keep people stimulated and happy? Ultimately, we need to design a society where we look forward to getting old, and where we have a purpose.

The majority of the session took the form of lively discussion and debate between everyone present. Many people voiced frustration at the lack of visible results that are helping older adults despite the millions of euros that have been invested into addressing the challenge by AAL. Various barriers to introducing new technology in the home and building age-friendly homes still exist due to fragmented market forces and the muddled complexities of everyday life.

One member of the audience wondered how we could make hospitals a better place for patients to free up time for care. He suggested that if we could use tech to automate routine tasks then there would be more time for human interaction that is so valuable for older adults' wellbeing and happiness. Another's response to this was that we should in fact be moving parts of hospitals into the homes. Homes can be holistic environments that provide many services to those living in them.

W23: Environmental design for houses

Chair: Matteo Zallio | Speakers: John Mcgrory

Two vital aspects of the life of an individual, in order to maintain a healthy lifestyle, are represented by domestic autonomy and maintenance of relationships within the neighborhood. This leads to an interesting research issue: could houses and appliances have the potential to improve autonomy and people's quality of life? Which kind of methods and tools could enhance wellbeing and healthy conditions?

The house has the potential to be a safe, adaptive environment, integrated with technologies for life support. It is fundamental to underline the importance of the key elements such as architectural accessibility, interior design features and interactive technologies, related to user experience design.

Dr Matteo Zallio presented an overview on IoT based technologies and interaction design approaches, both useful to design and refit houses for senior citizen needs. Case studies, experiences, publications and the results of the previous three years of research, were presented as an introduction to the user experience practices and design strategies necessary to be used in order to address the special needs of every single user, with a defined and precise focus on ageing people.

Dr John McGrory presented a focus on how to create responsive smart environments, starting from the basics laws of electrical and electronic engineering. The refined learning method, based on practical examples allowed participants to focus more on the tasks that senior citizen has to face on a daily basis and how sensors and actuators can easily facilitate their condition of life.

The proposed workshop and design approach was based on a scenario composed of two empirical strategies which aim to support the creation of a new standard of houses in which users can live in a healthy way, enjoying the opportunities of ICT, which shall be "enabling" and integrated in an unobtrusive way so as to be accepted by the user. This workshop took inspiration from some recent approach in automation services, which represent an innovative tool to manage small tasks between internet-connected devices with a simplified method. In the latest years are growing different automation services like IFTTT, Zapier and Cloudwork, but as a result of a first analysis IFTTT shows one plus that other systems don't have: simplicity, that is one of the most important feature that we need to consider in order to make a product attractive for Senior users. IFTTT can be considered a task automator, a specific software that can have a profound impact on associating different objects within our surrounding environment in order to increase productivity.

The aim of the workshop was to create collaboration between all the participants, in order to create some useful samples of ideas specifically designed for senior users, using common IFTTT procedures or task, but that can simultaneously be easily used by younger family members, carers and relatives. This is a new approach in defining which technology is important to be used in our houses and simultaneously wants to increase the knowledge of smart automation technologies between ageing and senior users. The feedback from the participants has been extremely useful in order to develop the next stage of research that will be performed in the next year.

W24: Expectations for AAL and enhanced living environments in 2025/2030
Chair: Francisco lorez–Revuelta | Speakers: Susanna Spinsante, Nuno Garcia

The session started with Dr Nuno Garcia presenting the scientific context of the COST Action "Architectures, Algorithms and Platforms for Enhanced Living Environments – AAPELE," to which all the three speakers belong to. AAPELE is a network with more than 380 members, which aims at fostering research and technological cooperation that focus on promoting the interchange of ideas between researchers from different scientific backgrounds on the subject of AAL. It is structured in six different working groups: Networks and Communication Infrastructure for AAL Services; Requirement Analysis and Profiling; Protocol and Platform Analysis, QoS, QoE, and Capacity Planning; Medical Data Acquisition and Algorithms; User Interaction; and Mobile AAL Applications and Communications.

Dr Francisco Florez-Revuelta reviewed different research roadmaps on Ambient Intelligence (AmI) and AAL published in the early 2000s, summarizing which were considered the key aspects to be addressed, and technologies and services to be developed. As more than ten years have passed since their publication, it is possible to analyse if the predictions made have been fulfilled. The conclusion is that, although AmI and AAL technologies and services have advanced, they have not reached the expectations that researchers had. The authors of those roadmaps are usually biased by their own expertise, and there a number of socio-political factors, and business and industrial models that produce breakthroughs in the developments and early adoption by the users.

Dr Susanna Spinsante gave a talk on "AAL: What's next? A long term view". She first introduced the EIP-AHA short term aim about AAL, looking at the recently started 2016-2018 period with the renovated action plans. Then, a detailed review of the AALIANCE2 roadmap and strategic research agenda was delivered, being those documents the founding guidelines still in force, despite dated back to 2014. The changes with respect to the 2010 version of the roadmap have been highlighted, as well as the different scenarios presented in details. Finally, emerging trends within AAL have been identified (like wearable devices market, mHealth, robotics…), and some innovation directions suggested, related to future communication technologies for AAL.

Finally, the attendants were divided into small groups to discuss why these expectations of several roadmaps have not been fulfilled. They were also asked to discuss how an AAL user would be living in 2030, following the next tasks:

- Task 1: create a "persona". Who is your user? How old is he/she? Does he/she still work?
- Task 2: describe a day in that person's life. What is it to be her/him in 2030?
- Task 3: What is the role of AAL/ELE technology in that user's life?

The participants expressed their views about what they would like their lives to be when they become older. As it is usually expressed in the AAL community, there is not only a single type of AAL user but each individual have specific needs and preferences. Therefore, the participant created a "persona" who was, broadly speaking, a summation of all the

needs and preferences described individually. This person, aged 65-70 years old, although with some limitations due to impairments (mostly physical were mentioned, not so much cognitive or sensorial), would like to have an active life, as independent as possible, living at home. This person still works, with their job adapted to their capabilities. However, I preferred s/he would stop working and would be able to travel or visit relatives. Health management was also highlighted by the participants, with multiple sensors been used to monitor health and lifestyle, while preserving privacy required by the user.

From the discussion developed around the topic of Task 3, it emerged that artificial intelligence, machine learning and big data will play an increasing role in future years to come, and they will also dominate the technology arena in the field of Active and Assisted Living.

This enforces the vision shared by the workshop organizers, of an IoT-enabled domain of AAL and Enhanced Living Environments (ELEs), and this may be listed among the outcomes of the workshop. In fact, the discussion involved different people with different backgrounds, and such a diversity of contributions all focusing on the same expectations support the motivations for the research initiatives currently carried on within the field of IoT for AAL and ELEs.

The workshop made it possible to disseminate, among the attendants, information related to the COST Action AAPELE, its research targets, its initiatives, and the different activities carried out by the members of its working groups. The exchange of contacts among the workshop organizers and the attendants contributed to create new networking opportunities, which is among the expected outcomes of the Action itself. It is important to highlight the role that Industrial stakeholders and decision/policy-makers should play in a multi-disciplinary COST Action such as AAPELE, and the workshop contributed to favour this kind of inter-exchange and respective knowledge.

The interactive session organised within the workshop, made possible for the attendants to have a personal involvement and contribution to the discussion, gave also the occasion to discuss issues related to research methodologies in AAL, available tools and approaches to funding, and to share common problems encountered when applying to AAL-related funding calls.

The multidisciplinary background of the attendants, as well as their different stakeholder profiles, made possible to obtain relevant outcomes for the session. This will serve to prepare a paper on "A critical review of Ambient Intelligence and Ambient Assisted Living research roadmaps," which will be published as part of the actions of AAPELE.

W26: Merging technical development and an ageing workforce
Chair: Sibylle Olbert–Bock | Speakers: Jacqueline Lemm

INTRODUCTION
Some notes on digitalisation, changing the value chain and its impact for the working environment

Prof. Dr. Sibylle Olbert-Bock and Roger Martin, FHS St.Gallen – University of applied Sciences

The goal of the workshop was to shed some light on the opportunities as well as risks of digitalisation, with a focus on the older workforce, especially those over 50 who wants or has to stay in work.

• New Technologies can be used to
• Retain the resource of older workers
• To support older employees in the working process
• Provide better access to the particular experiences of older workers and preserve knowledge and skill in the company.

After a short introduction and an overview on ongoing changes, the first contribution from Jaqueline Lemm concretised the impact of the sociotechnical change to the textile industry. Pierre Rossel gave an Insight on how the digital transformation has and will affect the later working life of actual and upcoming generations. Annette Angermann illustrated the interest of a connection between the AAL- with the MYBL program and vice versa. Astrid Stückelberger finished the contributions as she explained how existing routines and behaviour may impact the quality of recommendations and for that should be taken into account while transferring research results into other domains and into practice.

Digitalisation and Active Assisted Living are on everyone's lips. It is often seen as a threat since we do not exactly know what to expect. But enabling individuals and machines to communicate seamlessly would of course make production more cost efficient. But perhaps more compellingly, digitising the

value chain facilitates innovation and can directly improve the top line. For example, the aggregation and analysis of data across a product's life cycle can increase the uptime of production machinery, reduce time to market, and make it possible to understand the product's consumers. It may make product innovation less about "tribal knowledge" and gut feeling and more to an exercise in analyzing, testing, and responding to hard data and robust simulations. (McKinsey 2016)

In so called "readiness studies" in the second sector, emphasis of the Industry 4.0 seems to be unilateral. The technical aspects seem to be predominant while the potential users of the technologies with their goals as well their expected utility are unconsidered.

Regarding the companies, many publications conceal the concrete Business Case in the sense of «why should business use Industry 4.0? What are the objectives they want to achieve? Or it stays on very abstract level. The same for the use of technologies in the working process: it rarely considers actual challenges for the workforce and provides adequate support. Predominant is the attitude "now that we have got a solution – where's the challenge". Demand and supply of solutions seem to be developed and kept independently. Similar presentation on what is needed for Industry 4.0 are growing and the myth 'everything will be fine by using cyberphysical systems' is prospering without addressing existing challenges in the transformation phase or challenges even induced by the use of technology itself.

Little differentiated and without being able to seize robust data is the discussion when it comes to recommendations for management and workforce the so-called human capital. Focusing on this unilateral positive view, we could really think about abandoning HRM as a discipline of management. Before doing so, we should consider, whether the development really will automatically turn out positive for
• The transformation process and
• The sustainable implementation of Industry 4.0.
• Both are merely reduced to a challenge in adapting competencies.
• The impact of the permanent use of technology regarding creativity, innovative behaviour and the mutual cooperation. This is crucial due to the fact, that the question how a permanent competitive advantage for companies or the whole economy can be developed.

With regard to relevant competencies, practical management literature seems to be suggesting we concentrate on the recruitment of young talents: Conceptions of an "ideal" workforce seem to be
• Digital Natives who act together
• Independently, flexible and in a cooperative / connected way and
• are supported through intelligent technologies and adaptive programmes for the immediate accomplishment of requirements.

At the same time: older people will probably have to stay longer in the job in the future due to demographic development. But the question of how to preserve human capital is rarely addressed and raises the question about which key competencies could respond sustainably to the continuous development of new requirements, e.g.

• Competence to act in an intelligent, interconnected situation
• Steady development of specific professional expertise, ability to validate given results
• Coding is not only for programmer
• Multiple communicative and cooperative abilities (real und computer-assisted; interdisciplinary)
• Ability to deal with complexity, abstraction and problem-solving abilities
• Self-organisation- and Meta-cognition competences.

Managers' conceptions of elderly workers remain deficit-oriented and label them as less flexible, less adaptive etc. In fact, corporate HRD stops around 45/ 50 years, elder workers remain in their functions and their capabilities fatigue with their functions.

In the age of digitalisation, an enormous confidence in the younger generation takes place, partly due to shortcomings in quantitative disposability equalised with lacks in disposability of (technical) capabilities.

A change of mind-set has to be made to avoid the age limit of a so-called 'elder worker' decreasing faster and faster due to the loss of actual competencies while working in a technologically dynamic environment.

It would be in our own interest that: The accomplishment of tasks in a technological "intelligent" working environment relies on tacit/ implicit knowledge and experience. Possibilities to support people by technology and to avoid the loss of competencies due to technology-use remain under-discussed.

Digitalisation in an old, and not always «fashy» Industry: Sociotechnical Change in Textile

Dr. Jacqueline Lemm, Institut für Textiltechnik (ITA) & Institute of Sociology

As mentioned, the supply with and demand for new technologies to support an existing workforce are rarely thought in common. This contribution highlights how the development and implementation of new production technologies may foster social and therefore foster technical innovation.

In the context of the research group SozioTex, funded by the German BMBF, Funding Priority "Interdisciplinary Development of Expertise Concerning Human-Machine Interaction with regard to Demographic Change",the research on textile machinery seems to be especially relevant. The engineers of ITA develop new components and complete machines - for example weaving machines. The notion of 'Industry 4.0' includes
• Cyber-Physical Production Systems (CPPS),
• Self-optimising machines and
• New human machine interfaces.

The (German) textile industry may be of major interest as employers are confronted with the low attractiveness of younger workers, while simultaneously 50 per cent of employees in textile production are 50 years or older. The addiction to replace older by younger workers is less pronounced than in other industries. Anyway, precursory layoffs / conversions of older workers in restructuring resulted in a loss of knowledge (skills and experience) and cognitive and physical deficits constitute barriers in the production process. The workforce is getting more diverse not only in terms of age but also in terms of cultural aspects and different languages.

Besides demographic change, digitalisation as another central socio-technical trend, adds to the complex situation in the textile industry. New digital working environments require new skills of personnel that vary according to diverse age- or educational-related socio-demographic backgrounds. The development of Digital Working Environments such as augmented reality (AR)-based assistance systems, in connection with up-to-date textile machinery (e.g. user-adaptable Cyber-Physical Production Systems) are developed.

It is considered that implementation of digital information and communication technologies (ICT) into production systems and production processes change:
• Temporal and spatial flexibility of work
• Qualifications and professional cooperation.

But when taking into account the growth of the group of older employees, the textile industry faces a dilemma: On the one hand it is assumed that younger employees who already grew up with new technologies (Digital Natives) might more easily cope with digitalised, (more or less) autonomous textile production. On the other hand, older employees are usually more experienced in setting up complex production processes, e.g. textile machinery, manually. This means that

personnel and organisational issues, such as new organisational and training forms, as well as differentiated-dynamic job designs must be considered as important so-called 'soft factors'.

It is therefore important to enable and support learning in the work process, combining both strengths, for which the implementation of assistance systems is considered as useful.

Key questions are on
• How individual needs of an ever more heterogeneous workforce (for example age/ language barriers/ different education levels) may be respected by assistance systems in complex (e.g. digitalisation) working situations to develop and introduce new socio-technical systems (assistance systems) for competence conducive, supportive MTI,
• How to support employees with cognitive and physical deficits
• How to archive, process and share knowledge and experience.

Given an example, two employees manage 50 different machines at the same time:
• Assistance Systems should
• Serve as intelligent technical tools that assist in certain situations/with certain actions and help to develop expertise in the textile chain
• Analyse current and possibly predict future (machine) conditions
• Support the natural course of action of heterogeneous user groups and achieve physio-cognitive relief.
Physical assistance systems focus the optimisation of ergonomic aspects and support in physically heavy work processes. Cognitive assistance systems provide processed information for the user and focus on perception, inference and planning.

To develop those forms of assistance in industry an iterative procedure is needed:
• The requirements are determined by literature reviews and in-depth interviews realised within focus groups at the ITA lab and personnel at three partner mills (on the shop floor and the managerial level).
• To detect Critical machine parts a standardised survey is done in 18 weaving mills (there are only roundabout 50 weaving mills in Germany!)
• Error-prone operations in the working process

are analysed by participant observation in three mills.
• The development takes place and is validated at lab-scale as well as implementation in actual production lines.
• During the first year an assistance system based on AR has been developed.

Tests with heterogenous user groups have been done at the ITAlab- and production-scale. Users where asked to evaluate the assistance system. Results show that tutorials, and augmentation are very clear and easy to understand, the application is easy to use for the first time and most of respondents enjoyed using it.

Another task is to develop an assistance system for the activity of "warp-beam exchange". Employees at the shop floor level were asked about their physical/cognitive stress and their wishes about support during the warp-beam exchange which is seen in working conditions (noise, dirt, poor posture, height of the work unit) and simultaneously executing a cognitively demanding task and the need to concentrate.

Based on Workplace and work process analysis height adjustment of the loom are deduced and a tablet-App to support the working process by simplifying the operations, improvement of communication and a digitisation of work organization.

Facing the challenges of workforce ageing and digitalisation, the different needs in effective support of an age-heterogeneous workforce is obvious and employees appreciate support. But not for the price of the lack of independence and loss in autonomy.

Living the digital Transformation in later Working Life – An Insight
Prof. Dr. Pierre Rossel, EPFL
Prior to the actual discussion, HomeOffice and Telework has been a hot topic 25 years ago. Facing another challenge is typical to digital live. But national as well as sector-specific differences and developments sustain and working situations vary in use of technology.

The question is: What has to be done to effectively retain older workers in the workplace and how to address adequately this high variety of situations (according to profession/ sector/ management level) by solutions?

"What seems to be helpful from the perspective of a person is - how is three days apart from retirement?"

Time and again, a solution has to be found at every age facing new problems caused by the use of technology: Firstly, it was necessary to evolve with emails and what followed were security issues as a never ending story. In a third step, collaborative work came up as the software changes all the time. Nowadays there is a need to defend reputation and the own name and identity with regard to topics in the internet. And the newest challenge is to teach students that track and validate statements simultaneously to the lecture. Is it possible to teach real time in Switzerland and in China, and what will they learn and keep?

From AAL to MYBL and back

Annette Angermann, JPI - More Years, Better Lives

Three initiatives intensify their collaboration: AAL / MYBL / COST. By collaboration, they target the exploration and understanding of Demographic Change through a cross-disciplinary and holistic approach, implementation through joint activities, alignment of national/regional and EU programmes and activities and public engagement.

The objective of Joint Programming Initiatives (JPI) is to increase efficiency and effectiveness of public R&D funding in Europe and to provide solutions to resolve societal challenges, which single Member States are not capable of resolving alone: climate change, energy, population ageing, demographic change and are additional to existing initiatives. COST is an existing mechanism to strengthen the collaboration between initiatives and researchers. The following table sketches the aims and the activities:

As JPI, MYBL and AAL are working in the same domain, but focussing on different aspects, it makes sense to collaborate and to bring the research communities (researchers active in JPI MYBL + R&D community of AAL) together:

One research focus of MYBL is exploring how existing and emerging technologies can better contribute to the quality of life and social engagement of older people

A related focus of MYBL is the scientific examination of how physical environments, and the supporting infrastructure of education and technology, can best be configured to meet the needs and aspirations (physical, social, psychological and emotional) of older people. The COST mechanism is ideal to initiate scientific collaboration between research communities and to advance the efforts of demography related research in both AAL and JPI MYBL

How to get started

Dr. Astrid Stuckelberger, Institute of Global Health, Faculty of Medicine, Biotch Campus

Technology may help to keep older people in working life but also be the cause for diminishing roles. While discussing intensively demography-related challenges, the question persists, what is meant by an "older" worker. A missing awareness is observable whereby people as well as companies that are not thinking about new technologies will risk being ignored.

It is not only necessary to understand new technologies. The social impact and human side have to be understood to define adequate policies. Policies will fail when they do not pay adequate attention to the existing capabilities of older people and may result in discrimination. The concretion of what makes an "older" worker/ employee or a "generation" is necessary. Differentiations within a "group" are often more pronounced than existing similarities. An ignorance of this variety results in wrong policies.

To enable the definition of adequate policies in the workplace, several barriers must be removed:

- Barriers in existing tools: Improving the health status of human resources in organisations by the value of work. Parameters must be established and adapted to changing situations.
- A second barrier is the non-use of recommendations and tools in companies. Why do we face a gap between knowing and doing? One of the major reasons is to be found in existing work performance obligations.
- Further barriers are aspects of direct discrimination and indirect discrimination by national and corporate politics.

Employers tend to dismiss older workers/employees, often following stereotyped expectations about flexibility and learning aptitudes whereas capabilities are overseen e.g. the persuasiveness and acceptance of e older worker/ employees in sales.

The age of retirement remains an example for discrimination policies as well as national particularities of social insurance systems. Ignoring older people in training/retraining, starting-up, undifferentiated standards in pre-employment and supporting wellbeing are only some examples.

Summary

With her contribution, A. Stuckelberger turned the attention to misguided policies as a consequence of deficits in the renewal or even consolidation of assumptions while addressing surrogates instead of the phenomenon. They are to be found at the level of national as well as corporate politics. As an example, in the introduction of the workshop stereotyping between older and younger people seems to intensify while an inevitable discussion about relevant and ongoing shifts in competencies required remain under-addressed. Even when recommendations address phenomenon, they are rarely picked up to optimise practice.

As P. Rossel suggested, today's challenges of "demographic change" have rather symbolic character to what we are moving beyond at every age. And in the case of companies, we do not always face a high interest to actively seize those challenges caused by demographic change.

Looking at occupation, people of every age will have to challenge their employability whereas employers stabilise their roles as a gatekeepers

of employability the more development takes place "on the job". The coproduction of competencies between employers and the workforce is mostly neglected. It is an open question whether the so-called "digital natives" are really better prepared to overcome novel challenges that will occur earlier and earlier in their working life and if they will find enough possibilities to reinvest in their capabilities. How will they cope with "Ongoing technological challenges" without having had the possibility to assemble a stable experience or a knowledge base that integrated the "Background of development" of knowledge? What should be done in terms of learning?

The discussion illustrates that there is less common ground for overall recommendations than is suggested by literature and a more diverse picture of development needs has to be carried out.

A further self-observation is the fact, that the use of technology always produced novel problems. In view of side effects, it has to be scrutinised if they are always as unpredictable as assumed. Probably it might be the result of a limited individual and an unbalanced collective competence. It is unlikely that the problem will solve itself, without preventing actively the degradation of sense for reliability of "knowledge" while using the internet. This leads not only to the desideratum to foster technical but also socio-technical competence.

How competent are the drivers of digitalisation and decision makers with regard to sociotechnical awareness as well as technology in fact? What has to be suggested as relevant competence?

They may be regarded as preconditions to adequately assess long-term effects and side-effects of technology-use in society and for work. As an example the question arises whether international real time classes may be more effective than classes held according to the cultural background? Do different cultures and culture-adequate instructions preserve international competitiveness? Are we able to really reproduce the same effects by using technology?

Far away from those considerations, it would be very helpful to use technology to level physical constraints (e.g. hearing). Comprehensive approaches/ solution packages that combine technology with demography-related structural/ cultural activities could be of interest. Inversely, Technological assistance may support the implementation of other demography-related activities (e.g. working time schemes).

The case of user-adequate and participative design of CPS in textile industry by J.Lemm illustrates how physical and cognitive requirements interact and may be addressed by holistic approaches that are not very common yet. For the moment we still have to be satisfied if decision makers even know about technological developments and
• Retain the resource of older workers
• To support older employees in the working process as well as
• Having better access to the particular experiences of older workers and preserve knowledge and skill in the company.

Key questions are how holistic approaches may be integrated in a technology-driven discourse and how socio-technical competencies can be increased at all levels in their degree and their importance.

Therefore as a first step, existing solutions in the field of occupation/ work must be delineated from a user-perspective and the simple question about existing challenges in the workplace and how and under what conditions technology contributes to solve them.

A second step is the improvement of accessibility of technology for various stakeholder-groups.

Beside the availability of AAL solutions that have been developed by AAL or at market, knowledge in order to be in the position to convince, in a third step, holistic approaches are needed to evaluate the use of technology and its effects. Reasons for use/ non-use could be a starting point to foster diffusion of AAL solutions and their use and transparency in side-effects of technology-use a starting point to respond to them (e.g. resigning to domination by technology; consequences for communication/ cooperation/ loss of competencies).

Last but not least holistic approaches could integrate challenges for sustainable development of a humane digital society and economic system.

As participants discussed if responding to flexibility-demands of elder worker will end up in levelling social standards and security (e.g. flexible pension schemes) and increase stress, a last proposition is the question:

How should we find a new balance of adequate standards for occupational health and safety and individual flexibility and needs? How could socio-technical solutions contribute?

W27: Public procurement of AAL solutions – Preliminary lessons learnt from the STOPandGO project

Chair: Sofia Moreno Perez | Speakers: Ilse Bierhof

Overview of STOPandGO

Public procurement of innovations (PPI) is a promising instrument for boosting the adoption of existing innovations through public administration and to create critical mass and additional validation for solutions that have just or are about to enter the market.

The STOPandGO was (at the time of the forum) the only European project addressing how to implement the PPI instrument for services for older adults in Europe. The main objective of this workshop was to share with the audience how things actually happen in this procurement processes and to create awareness of the real barriers and challenges of the instrument. It also offered potential early adopters of the approach a head start and gave suppliers an insight into how they could benefit from this new approach.

The rapidly ageing population across the EU is placing relentless pressure on increasingly scarce health and social care resources. More people live with multiple co-morbidities, and there are fewer people to care for them.

The Whole System Demonstrator (WSD), a huge randomized trial of telehealth and telecare, showed that incorporating telehealth and telecare technology into care and cure services can lead to reductions in the need for people to access services, as well as improving their ability to live better lives in their own homes (e.g., quality of life).

STOPandGO was designed to overcome some issues identified in WSD and to illustrate real improvements in quality of life, care and carer programmes, hospital in-patient stay, and other service outcome aspects felt to be essential. In addition, STOPandGO aims to identify the PPI benefits of STOPandGO for industry and the localities throughout the process in relation to the situation before.

By adopting an innovative procurement approach, STOPandGO's PPI Pilot will show that the benefits identified in the WSD can be translated from small populations (their pilots represent about 10 per cent of a regional target population) to wider ones, providing for scale uptake of technology and proportional reductions in the pressure on services. It will also show that this approach can be applied across the EU.

Project objectives

The overarching strategy of STOPandGO has been to pilot an innovative procurement process to improve the lives of older citizens, according to the instrument named "Public Procurement of Innovative Solutions" (PPI). The project will produce and validate a standard "European Specification Template" (EST), that will be enacted in a coordinated manner in six localities.

STOPandGO is aiming to show that an innovative procurement process based on the service delivery approach will prioritise the ongoing evaluation of the achievement of meaningful results of clearly defined clinical and social outcomes.

STOPandGO is in line with the European priority to support the implementation of innovative solutions and purchasing in health care to ensure cost-effective care and enhanced well-being for the aging population. This will encourage organisations to embrace innovative technology at scale, to build a critical mass for healthcare innovations.

Methods

STOPandGO aims to provide an improved service for older citizens by ensuring good management and governance, procurement, interoperability, legal, ethical and regulatory aspects, coordinated local tendering, quality control and evaluation, dissemination and exploitation.

A set of local tenders will be published by the procurers in close cooperation with the advisors – following EU regulations – and coordinated in each locality by the Executive Board.

In the first 20 months it will achieve the following milestones: overall project set-up and governance; application of the procurement process to include identification of outcomes and key performance indicators, preparation of business cases, tendering, and awarding of the contracts to the providers best aligned to the tender design.

Providers will deliver the desired outcomes for a sample population of over 5,000 beneficiaries. The remaining months will be spent deploying, monitoring and evaluating the achievement of identified outcomes, as well as continuing the dissemination of best practice deriving from the PPI pilot.

Example: Liverpool City Council – England

Help to live at home

Liverpool City Council tendered its new Help to Live at Home Service. This new care service will combine the current provision of Personal Care Services (domiciliary care) along with any day or community support opportunities particularly aimed at older people. The aim of this new service is to ensure that the most vulnerable citizens living within the city receive a more flexible, responsive, person centred service that helps them to remain living at home safer for longer. Liverpool City Council is looking for a number of care providers to be able to deliver their Help to Live at Home Service. The contract value is up to £15.6M per annum.

It is felt that by utilising the latest technology solutions, both Liverpool City Council and the service users that it supports would benefit by:

- Improving the quality of both the type of care being offered and the Help to Live at Home services in general
- Improving individuals' life, health and wellbeing, giving people increased control and assistance with everyday living
- Increasing, improving and promoting service user independence, promoting self-help, reducing reliance on services and helping people to remain in their own homes for longer
- Ensuring services are safer, more cost effective and efficient, with better use of resources
- Meeting the increased pressures on services as the demand for social care increases
- Assisting with the preventative agenda so there is less need for more, longer term care and support packages
- Helping with the integration between both health care and social care
- Improving communication amongst service delivery partners
- Making services more accessible to service users

It is hoped that the introduction of innovative technologies will be able to improve the quality of the service as well as getting a more cost effective service. This may be through better management of the staff through e.g. geo-tracking technology, or better quality services by apps monitoring service users wellbeing.

The S&G budget will be used to fund the technologies for the first year of the contract. Then analysis of what is the most effective will be carried out and only those technologies will be funded going forward.

Liverpool City Region is being developed as a devolved authority when five other councils join Liverpool to form the new authority. There is the opportunity to roll out the technology to the other authorities.

Workshop conclusions
What are the challenges?

- Defining the unmet need, and related to that what is the outcome (not solution) a procurer is looking for?
- IEmbed in long term policies to ensure continuity.
- Mutual trust, e.g. for bidders to know that a procurer is committed to buying and for procurers to buy a solution that hasn't been validated on a large scale.
- Partnerships when procuring services, defining roles and responsibilities of partners in a bid and meeting possible partners.
- Market consultation takes time and legislation can restrict the possibilities
- Payment by outcome is difficult to implement and lack of experiences of procurers in building a business case.

Benefits and outcomes

- Forces a change in mind-set for procurers as well as providers and suppliers.
- More opportunities for innovations to reach a critical mass.
- When focusing on organisational aspects it not only paves the way for a single procurement but creates the favourable landscape for other innovations to flourish.
- 'Learning by doing': Development of material tailored to the needs of procurers based on real-life experiences.
- Additional information/time needed before submitting bids, two published tenders have received bids.

W29: Domotics and robotics for Alzheimer's disease

Chair: Antonio Greco | Speakers: Daniele Sancarlo

The workshop 'Domotics and robotics for Alzheimer's disease' involved three speakers: Daniele Sancarlo (IRCCS CSS, Italy), Meftah Ghrissi (Robosoft, France) and Pasquale Chiarelli (IRCCS CSS, Italy) and its chairman was Antonio Greco (IRCCS CSS, Italy).

It aimed to promote discussion between different actors involved in the care of older people in order to find and develop suitable ICT technologies to improve their quality of life, improve independence, and reduce the cost of care.

The first speaker, Ghrissi, in his talk titled 'Robotic application in the determination of health status in the elderly', showed the results of his work in the development of a robot, Kompai, which is able to perform a comprehensive geriatric assessment. He demonstrated its possible application in several settings.

Daniele Sancarlo gave the second talk, titled the 'The usefulness of domotics in the management of elderly patients with cognitive disorders'. It included an extensive review of the application of technologies in the treatment and management of elderly subjects affected by cognitive disorders, highlighting the findings and limitations of the current literature studies.

The third talk, 'The economic impact of new technologies to assist patients with dementia', was given by Antonio Greco. He examined current evidence about the cost effectiveness of using different technologies to assist subjects with cognitive impairment.

One of the most interesting aspects of the workshop overall was to clearly highlight the need to create dialogue between the different actors involved in care for older people and the technologists. This is what is needed to create useful solutions for older people in a sustainable and fast way.

It was also agreed that AAL needs to do more to work with structures hospitals, long term care facilities and nursing homes, as these are places where innovation can really make a big difference to quality of life.

The workshop provided a chance for all involved to share their experiences in this European context, allowing everyone to acquire knowledge of the different solutions and strategies available to tackle problems regarding assisted living.

W30: Improving autonomy with robotics
Chair: Einar Nielsen | Speakers: Michael Früh

Introduction
Einar Nielsen, NTB

The workshop was aiming to gather together multidisciplinary group of robot developers, robot specialists from the world of research, robotics industry and anyone interested in robot technology. The aim was to merge that expertise with specialists in AAL, medics and professionals from the health industry. The goal of this workshop was then to find new projects applying robot technology to AAL in order to push forward the product development in the field of elderly care.

The projects should be application driven and done in an agile way.

The uncanny valley
When Masahiro Mori built a robot looking like him, he made some fundamental discoveries about the human perception of robots. He quickly found out that:

• Human-like robots can be scary and creepy
• They behave creepy
• Their answers sound mentally disordered
• The skin looks diseased

Those were not good attributes for robots designed to look after the elderly or support them in their everyday activity.

Mori reasoned that we accept imperfection in a machine, but we don't accept it on a human-like machine – or indeed in a human. But do we accept imperfections in normal nonverbal communication, looking healthy, being mentally disordered, social behavior and human norms and ethics?

PAL Robotics is one of the leading companies in biped humanoids. Their goal is to develop service robots that enhance people's quality of life. The company was founded in 2004 by four engineers and they have successfully built several robots for services and research, contributed to open-source projects and participated in several robotic competitions.

REEM is a robot they developed that can recognise, grasp and lift objects and walk by itself, avoiding obstacles through simultaneous localisation and mapping. The robot accepts voice commands and can recognise faces.

Nao is another robot developed by Aldebaran Robotics. It has

• 25 degrees of freedom
• Maintains his balance
• Knows whether he is standing up or lying down
• Has numerous sensors
• Can hear, with hearing to interact with humans in a natural manner, by listening and speaking.
• Can see and can recognise shapes and objects

Finally, Pepper is an emotional Robot, also developed by Aldebaran Robotics. It Understands emotions and talks a lot.

Romeo is a research platform that can be used by all to develop robots for assisting the elderly. It is set in the apartment of a Mr Smith, who lives alone and has moderate memory disorders.

Romeo reminds Mr Smith about his medication, helps him remember the visit of the grandchildren, checks if Mr. Smith has forgotten the meal in the oven, etc.

The robot also alerts people, if Mr. Smith is not reacting as usual, when a remote operator takes control of Romeo to clarify the situation and decide on what action is appropriate. Romeo also supports Mr. Smith in calling friends, playing cards remotely, bringing books to his attention or watching the TV and providing a TV guide.

This relies on the following research divisions:
• Physical Platform: complex body, large functionality
• Dependability: analysis of risks incurred by Romeo and recommendations for containing these risks.
• Multisensory perception: integration of functions enabling the robot to interact better with its user and perceive its environment better.
• Cognitive interaction: reasoning, planning and learning mechanisms.
• Physical interaction: robot movement control algorithms.
• Evaluation: Robot simulation exercise in the presence of its end user

Telepresence in a robot allows a person to feel as if they were present, by giving the appearance of being present and being free to roam around anywhere. People are able to play an active role remotely. This enables carers, health professionals and family members to visit people remotely, but interact as though they were there. This also provides them with the ability to connect to people whenever they want or need.

Therapeutic robots have great value in the car situation as they help:

• Reduce patient stress and that of their caregivers
• Stimulate interaction between patients and caregivers
• Have a positive psychological effect on patients, improving their relaxation and motivation
• Improve the socialisation of patients with each other and with caregivers

Recommended focus for robotics in AAL:
• Mobilization, walking
• Going to the toilet
• Taking a shower
• Going to bed
• Bringing objects
• Getting food, cooking, eating

For telepresence robotics,
AAL should focus on:
• Location of the person
• Communication
• Reminding
• Emotions
• Motivation

PLENARY SESSIONS

AAL Forum 2016:
The opening ceremony

For those arriving on Monday evening, an exciting opening ceremony featuring regional politicians and researchers was put on at the Olma Messen St.Gallen. Setting the scene for the next two days, the anticipation from both the speakers and delegates was palpable

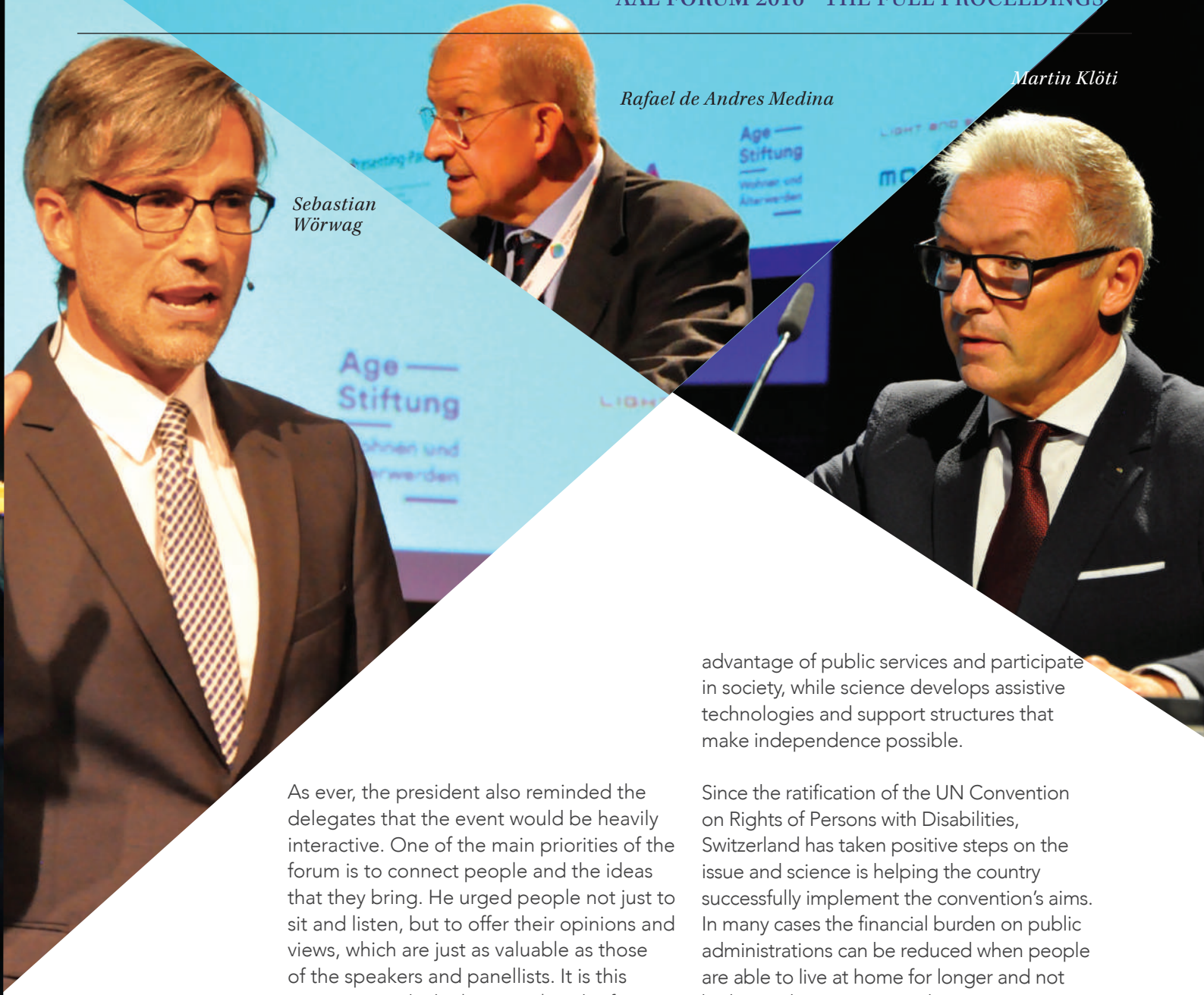*Compère for the plenary sessions was TV presenter Julia Bauer*

Traditional Swiss music was provided by Trio Anderscht

After a lively performance of traditional Swiss dulcimer music from the "Trio Anderscht", the opening ceremony of the forum began. Host Julia Bauer welcomed the delegates to St.Gallen and wished that everyone would be able to learn about what AAL technology was available today and how it can be spread to reach as many people as possible. After thanking the organisers of the event and the main sponsors, she then handed over to AAL president Rafael de Andres Medina.

The president welcomed the delegates to the forum and said what an honour it was to be opening the annual event, this year organised jointly with FHS St.Gallen. This year the forum was run under the headline "innovations ready for breakthrough", an important sentiment that reflected the drive behind those attending forum to

turn the results of AAL research and development into successful products and services.

The president reminded the audience that the AAL Programme brings together participating countries to work towards a common goal of improving the quality of life of older people through technical innovation and ICT solutions. This means helping them to stay healthy and independent, both at home and in the wider community, while respecting important issues such as privacy and security. "The forum is an excellent meeting place for private investor interested in the sector," he said. "Meanwhile, the programme also encourages innovation through instruments such as the Smart Ageing Challenge Prize and the hackathon."

Rafael de Andres Medina

Martin Klöti

Sebastian Wörwag

advantage of public services and participate in society, while science develops assistive technologies and support structures that make independence possible.

As ever, the president also reminded the delegates that the event would be heavily interactive. One of the main priorities of the forum is to connect people and the ideas that they bring. He urged people not just to sit and listen, but to offer their opinions and views, which are just as valuable as those of the speakers and panellists. It is this interactivity which always makes the forum an event to remember.

Next on the stage was Martin Klöti, St.Gallen's interior minister, who began by welcoming the delegates to the city and mentioning what an honour it was to be speaking at the opening of the event. St.Gallen has positioned itself as the one of the leading locations in Europe for looking after older adults. 6000 older people are homed within its specialised residencies – just under 30 per cent of all those over 80 years old. These figures demonstrate that people always prefer to live independently if possible, and Klöti suggested that if science and the state work together, they can help people to do this. The state provides the framework conditions that help people take

Since the ratification of the UN Convention on Rights of Persons with Disabilities, Switzerland has taken positive steps on the issue and science is helping the country successfully implement the convention's aims. In many cases the financial burden on public administrations can be reduced when people are able to live at home for longer and not be housed in institutions. The government and science need a strong partnership, said Klöti; together they can help provide an environment in which older people can live independent and autonomous lives. He reiterated his government's aim to make the country place where where everyone has equal opportunities.

Sebastian Wörwag, president of FHS St.Gallen, announced how privileged everyone at the institution felt to host so many regional and international researchers. He voiced the strange paradox that all of us face: we all want to reach old age, but none of us want to be old. AAL technology can however improve quality of life for those in old age, aiding with physical and mental challenges and contributing to helping

people stay in their homes for longer. It is important for people to participate in the modern technological society, he said, and that is a reason why everyone at the forum should be proud of their work.

A lot of technology has been developed under the umbrella of the AAL Programme, but making feasible products that people want to buy is one of the biggest challenges we face. FHS St.Gallen has been carrying out research specifically aimed at bridging the gap between technology development and the market - a "difficult challenge indeed," he said, "but not insurmountable .Another theme related to this challenge was the need to make products that are desirable but that do not make people feel old. "Dementia is probably the most difficult challenge we face as a society," said Wörwag, "and that should be the main focus of the AAL Programme in the future."

short speech on the end user perspective of AAL. As the largest organisation in Europe representing older adults, AGE Platform Europe recently launched an online debate to help with their online strategy. Asking people what their dreams for the future as older adults were, the main response was that people wanted to be able to contribute to society irrespective of their age, having fun and discovering new things while still remaining connected to family and friends.

But how can we achieve this dream? The first step is to fight ageism, said Parent. People face ageism every day, whether it is through access to employment, or indirectly through the increasing digitalisation of society that can marginalise the technically illiterate. Finance, appointments and chronic disease have all been made easier to deal with through technology, and this technology has the potential to improve the

> **"People face ageism every day, whether it is through access to employment, or indirectly through the increasing digitalisation of society that can marginalise the technically illiterate"**

He signed off by encouraging the delegates to go and see the city of St.Gallen and the surrounding area, with its picturesque mountains and beautiful lakes. "Nestled in amongst the borders of four countries, the city of St.Gallen is a culmination point not just of cultures but also of ideas," he said. As part of the Internationale Bodensee-Hochschule (IBH), a network of German, Swiss and Liechtenstein universities located around Lake Constance, FHS St.Gallen is at the heart of international collaboration in the AAL ecosystem.

Anne-Sophie Parent, secretary general of the AGE Platform Europe, then gave a

quality of people's lives, but if they do not know how to use it then the technology is useless. We need to do more to bridge this digital divide, which can be even more pronounced if the person has a disability such as decreased mobility or vision.

The evening ended with a panel discussion on AAL in the region of Lake Constance. Sabina Misoch of FHS, Alan Thielemans of IWT, Stefan Kroll of Terzstiftung, and Guido Kempter of FHV joined earlier speaker Sebastian Wörwag to discuss the creation of living labs in the region and how they can provide deeper insight into what users really need.

Keynote: Anne Sophie Parent

Anne Sophie Parent leads Age Platform Europe, an organisation that represents the views and interests of more than 40 million people aged over 50 in Europe. Delivering the first keynote of the forum, it was no surprise that she put the needs and desires of the older person at the heart of her message to all those developing solutions for active and healthy ageing

Anne Sophie Parent is a well-known face in Europe, for many years representing the voice of older people at events like the AAL Forum and as head of AGE Platform Europe, an organisation that brings together many other groups and associations that provide support and services for older people. While, an organisation like AGE needs to ensure that the challenges faced by our ageing society are addressed at every level, from policy to market, Parent adds a dimension to the debate that is both extremely constructive and refreshing. She looks at ageing "from the bright side".

For Parent, ageing should not just be seen as a problem, a time when we face health and social issues, a time when we need help and support or a time when we are isolated from the rest of society. Parent likes to see ageing as an opportunity to have fun and to do this there are other needs to be addressed if we are to continue having fun, getting out, engaging in social, sporting and cultural activities and contributing to the community as active citizens.

From this perspective, the AAL Forum was timely for AGE, coming as it did soon after the organisation launched a Europe-wide consultation looking to define its future strategy for the coming years. This involved a questionnaire to all members, which started with a simple question – what is your dream; what do you want the future to hold for you?

"The answers we received from across the network, despite different challenges and circumstances being faced, were all very similar," explains Parent. "Broadly speaking, people said they want a society where everyone, regardless of age, is able to contribute to their community.

"People want to remain at home, safely, while being connected with their friends and relatives. And people want to have fun, discover new things. They want to remain active citizens throughout their lives and to enjoy every moment."

The next question in the survey asked people how they thought we could achieve this dream? And here again, there was a general concensus.

"All said that what we need if we are to fulfill our dream and realise our vision is to fight ageism," Parent continues. "Every single one of our respondents said that they face ageism in their daily lives – from access to employment for older workers to access to goods and services.

> **"People want to remain at home, safely, while being connected with their friends and relatives"**

"What people are saying is that they want to create a society where older people can operate like anybody else, enjoying new products and services, new activities like anybody else."

Of course, with society becoming more digitalised, Parent admits that this is a problem for some older people and so this is another challenge. She acknowledges that it is now getting easier for people to manage their finances through online banking and on smartphones and quicker to make appointments with the doctor online without having to wait a long time on the phone. Meanwhile eHealth devices that have been developed for

Anne Sophie Parent

"What people are saying is that they want to create a society where older people can operate like anybody else, enjoying new products and services, new activities like anybody else"

self-monitoring and health management all bring great comfort to the lives of people with chronic diseases, while older people are discovering more and more of the wealth of cultural and recreational activities available on the internet.

"But despite all this, we are hearing that the digital society is just not as accessible as it should be for older people and to people with disabilities, many of whom are old," she says.

"The ageing process means that people may be losing their hearing or eyesight a little, or finding mobility or memory a little more difficult. These impairments, or combinations of them, make it more difficult to pick up and use new devices.

"And this is why we think that solutions that were very promising when they were developed as pilots are not really picking up the way they should be and they are not being deployed the way they should be."

Parent believes that there needs to be a fundamental shift in the way solutions are developed to meet the challenges older people face and to deliver the fun they so obviously want. "The reason we believe older people are not picking up the new devices and feel reluctant to embrace what they can offer is that these products are being developed like products being developed in any ICT sector," she says. "Something new is developed and designed, the market is tested to see if there is demand for this product and then it is launched and marketed.

"For older consumers this approach, where the market is imposing something new for them to use, does not work so well.

"The solutions that answer real needs generally start the other way around," she continues. "These directly involve the older people — the target market — at the beginning of the process, when they can help developers find the technical solutions for the problems and challenges they face in their daily lives. Those are the ones that hit the market."

Another reason why Parent believes older people are not embracing technology as perhaps they might is that new solutions are often designed to last for two or three years and then change into something else. "Older people have problems with this approach," she says. "First of all, it makes technology more expensive and secondly, by the time they have managed to use the device, become comfortable with it and find it useful for their daily life, it is time to change."

"People want solutions that will adapt with their evolving needs," she continues. "The physical and mental conditions of older people evolve all the time. They may get better at some stage and then worse again, and they need solutions that can cope with these fluctuating changes."

In a recent study by CREDOC, the research centre for the study and observation of living conditions, researchers found that 31 per cent of older people are less attracted to new technology because of its complexity, while 24 per cent are because they don't believe it will be useful in their daily lives. Twenty two per cent are concerned about privacy and poor data protection and 19 per cent find the technology too expensive. Parent seized on these statistics to drive home her key message to delegates at the forum.

"What we are pushing is for all stakeholders, especially those who have brilliant ideas, to try to involve older people as early as possible," she says. "Don't develop one solution and then try to convince people that it is what they need. Start by assessing the needs of a particular group and then try to develop the product that will meet those needs.

"When you reach a certain age, you get to know what you want out of life – and this will not always be what others think is good for you," she says. "So, as people developing the solutions to help older people live the lives they want using technology, do not try to impose things without them being involved."

Parent believes here that organisations like AGE and all its members associations also have a great deal of work to do to help older people engage with technology "As older people's organisations, we feel we have a duty to explain in a neutral and independent way the benefits technology brings for older people. We need to try to demystify technology and how it is used," she says.

"When you reach a certain age, you get to know what you want out of life – and this will not always be what others think is good for you"

She acknowledges that how older people interact with technology is changing and people have moved on from simply expressing their needs in terms of health and care and how technology can help. Now they are expressing their expectations and wishes as well and are beginning to look at technology as a means to achieve those wishes.

Parent sees a strong parallel between technology addressing the needs and wishes of older people and the development of smart cities, which is why the Age Platform is looking for synergies with the European Commission's Innovation Partnership on Smart Cities. "For us it is obvious that you cannot be a smart city if you are not age friendly and this also includes being dementia friendly," she says.

Another key European policy Parent is supportive of is the European Accessibility Act, which is an initiative at EU level to set common rules on accessibility, which will lead to cost reduction for the consumer and public authorities, will facilitate cross-border trading and will create market opportunities for accessibility products and services. This act will apply to computers and operating systems, ATMs, ticketing machines, smart phones, TV equipment including access to digital TV services, telephony services, audio media services, all transport services, banking services, eBooks and eCommerce.

"With all this going on, we at AgePlatform are convinced that there is huge potential for the developers of ICT in support of active and healthy ageing," says Parent. "We are all very happy with the growth of the silver economy and feel that AAL projects will soon be able to benefit from this. We would, however, like to see faster deployment.

"What I recommend, therefore, is that AAL projects should make themselves better known to AGE Platform member organisations and try to involve them more directly at the start of the development process. They will be met with enthusiasm and this will help many overcome any reluctance to use ICT."

Returning to the theme that these solutions should be both useful and add to the joy of life, Parent also advises looking at development with a holistic vision. "Make use of the older person's experience," she advises. "Then you can be sure that your solution will bring an added value to their lives, not just solving one problem, but solving one problem among many others and helping to solve those, too."

⊗ Keynote: Keith Baker

AAL technology has taken leaps and bounds in the years that the programme has been running, but the products being developed are struggling to be taken up by the market. **Keith Baker,** independent innovation producer at Two Healthy Life Years EU,suggested in his keynote speech that a closer, symbiotic relationship with those working in life sciences could be beneficial for both sides

New technologies and digital disruption are changing the world we live in at lightning pace. Concepts such as the Internet of Things seem limitless in their scope at this point, and much of the technology developed in the AAL Programme is using such concepts to push the boundaries of what we think is possible. However, Keith Baker, formerly of Philips, believes that we are still yet to push this technology to its limits.

Baker, formerly of Philips, told the audience in his keynote speech why he believes that there needs to be a coupling between the technologies created at AAL with the life science industries. He explained how working with the life sciences would be essential for AAL and Europe if it is to address the problems that will arise from its ageing demographic.

"Ageing is a huge problem for Europe," says Baker. "Although life expectancy is increasing across the world, the number of healthy life years is not. The World Bank recently suggested that any country without a ratio of at least 70 per cent between life expectancy and healthy life years lived into old age will struggle at an economic level to achieve a healthy ageing population. At present, there are only a handful of countries achieving this."

This worrying trend has the potential to become an overwhelming burden to society if is not dealt with properly. At present, not nearly enough money is being invested in the prevention of ill health in ageing. There are numerous comorbidities of ageing that occur, but many of them are not well understood. "Hearing loss is a significant problem in dementia, but this is not well recognised by the EU," says Baker. "Endocrinal disruptors are talked about a lot in reference to pregnant women, but little is known about their effects on ageing women. Sleep is another area where little is being done, as well as periodontitis."

Dementia is probably the biggest problem faced

"Hearing loss is a significant problem in dementia, but this is not well recognised by the EU"

Keith Baker

by society today, Baker says, for the obvious reason that for now there is no cure. AAL technology is therefore hugely important for creating a more robust population that shows reduced cognitive decline with ageing. This must involve combatting this decline from middle age, focussing on fitness, diabetes, social health, and other areas.

Baker explained how working with the life sciences can help push both technology and science to new heights and can create a far better business case for the resulting products.

"The technology I see being created and used in AAL projects is hugely advanced, and they are succeeding in that respect," says Baker. "But what we see from areas such as the hearing aid market is that they are much more influential and involved in the life science that underlies the basic service they're trying to provide. They've been involved and collaborating with life scientists for 80-90 years, and it shows. Now, research from the AAL Programme and beyond has hinted at many new ideas of what can be done in terms of the ear, but the life scientists are not involved or are even unaware that these possibilities exist."

"Although life expectancy is increasing across the world, the number of healthy life years is not"

Hearing loss has been shown to play a significant role in dementia, and this is an area where a lot of work can be done. "Apple's recently released AirPods, although they are lacking in many areas compared to hearing aids developed by the hearing aid industry, can help de-stigmatise the wearing of hearing aids," says Baker. "The technology they contain can also help to start connecting hearing aids with the

Internet of Things, as so many AAL projects are aiming to do.

"There are many lessons to be learned from the hearing aid industry. They have successfully collaborated with life sciences to understand the neuroscience behind their technology, and are in fact leading the way in terms of their research in this area. There is huge potential here for AAL projects to create really life-changing technology if they can utilise the life sciences in the same way. The ear is also an excellent place to monitor vital signs such as arrhythmias and heart rate, as well as hormonal balance. This can be incorporated in hearing aid technology using the Internet of Things."

Baker believes that this is a key point for AAL projects: embrace the life sciences, and the technology has the power to achieve so much more. "If you don't understand the life science behind the tech, you are blind to where you should be going with it. The way to do this is through funding PhDs which, although expensive, is the best way to start collaboration."

There sleep is the body's way of recuperating; it helps repair the body and the mind. Understanding the role
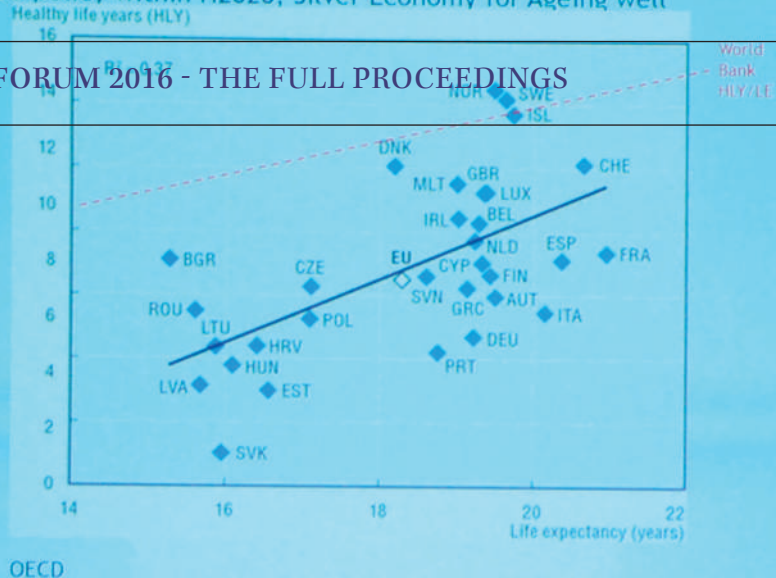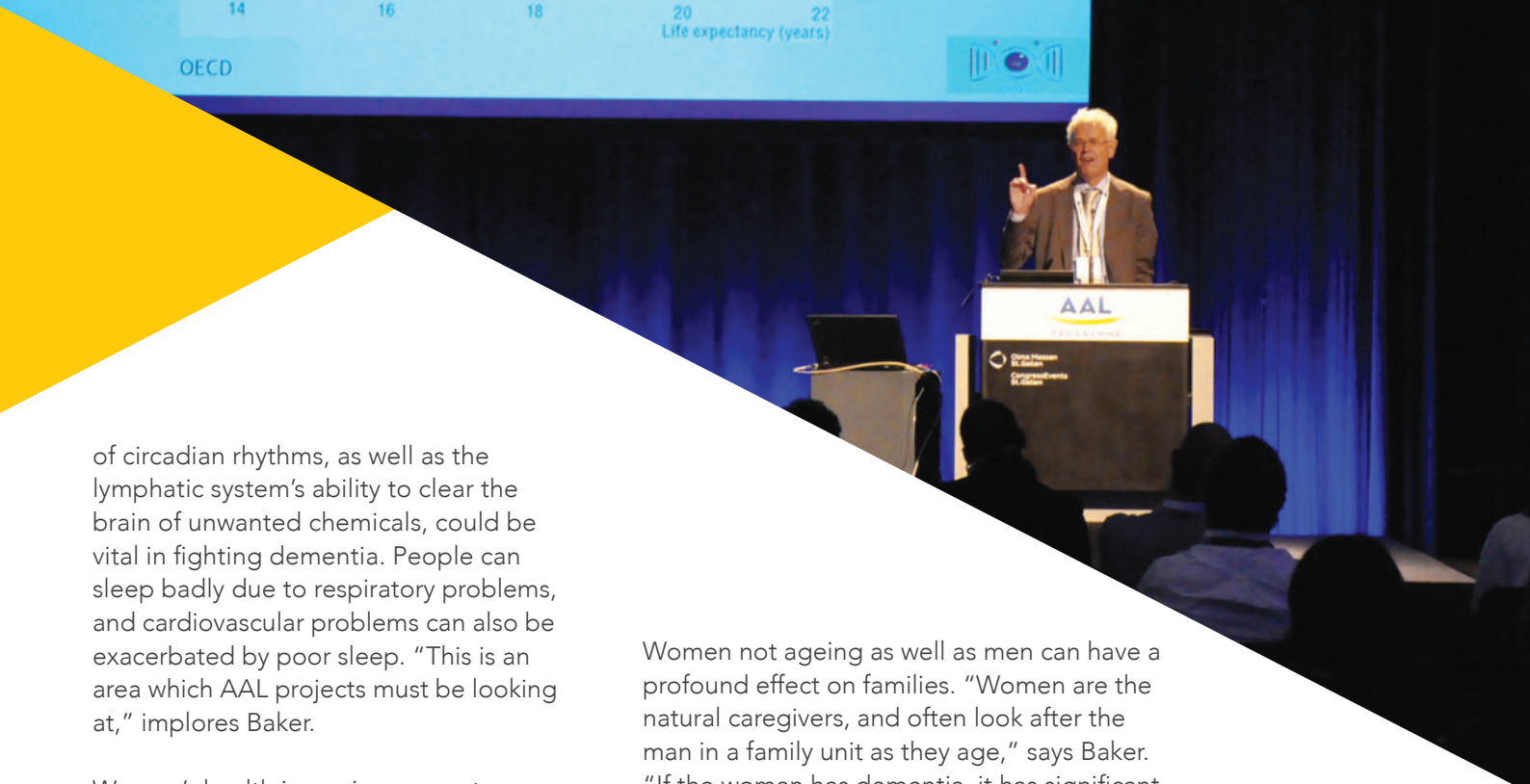
of circadian rhythms, as well as the lymphatic system's ability to clear the brain of unwanted chemicals, could be vital in fighting dementia. People can sleep badly due to respiratory problems, and cardiovascular problems can also be exacerbated by poor sleep. "This is an area which AAL projects must be looking at," implores Baker.

Women's health in ageing presents an intriguing issue to the life sciences due to their unique physiology. "Women are different to men in that they have two x chromosomes. In each cell of their body, one of these x chromosomes must be silenced in order to function properly, and the chromosome that is silenced is random in each cell. "This phenomenon, known as lyonisation, means that women's bodies are a mosaic of their two x chromosomes," says Baker.

"After the menopause, however, this effect is not stable, and the woman's body changes in a way which is impossible to predict," he explains. "This means that women's bodies are harder to treat in terms of the effects of ageing. All treatments must be personalised to the individual woman."

Women not ageing as well as men can have a profound effect on families. "Women are the natural caregivers, and often look after the man in a family unit as they age," says Baker. "If the woman has dementia, it has significant effects on the cognitive decline of the man and puts a lot of pressure on the wider family and social system. It is an issue that needs addressing fast."

Baker believes it is essential for AAL to address this particular challenge. Sensors can provide the data needed to help improve treatment of women as they age. "We need monitoring technology to see how an individual woman reacts to medication, how they react to disruptors such as changes in diet and sleep, and other factors which can affect health," he said. "This then opens the door for using big data to crunch the numbers provided by this monitoring to find personalised solutions that a human could not possibly hope to provide. AAL projects need to help the life sciences here, because at the moment, the life sciences provide good understanding, but not the solutions."

Keynote: Miguel Gonzalez-Sancho

One of the keynote speakers at the Forum 2016 was **Miguel Gonzalez-Sancho,** Deputy Head of Unit "ICT for Inclusion" at the European Commission. Immediately following his address, he answered some fundamental questions about his message and about the future of the AAL Programme in delivering effective solutions to the market

How can the market be created? The technology is already there but what more can be done?

The unprecedented change that is occurring in our society represents as much an opportunity as a challenge. The digital transformation that the world is experiencing in the uptake of digital health technology, solutions and services can drive a triple win for Europe; better quality of care for citizens, more efficient health and care delivery systems, and increased competitiveness, including new economic opportunities, jobs and investment.

This triple opportunity can, however, only be seized if we overcome barriers to public and private investments in order to scale up innovation in active and healthy ageing. These barriers result predominantly from dispersed initiatives and stakeholders, lacking critical mass and alignment on costs and benefits, dominance of data-silos and lack of interoperability that inhibits the sharing of information, failure to adopt suitable approaches to innovation and clinical validation, fragmented markets across the EU and across the spectrum of services covering the care continuum.

These barriers have been exacerbated by the financial crisis. The acknowledgement of the overwhelming that today's health and care systems are not sustainable and that innovation can deliver solutions, has not been sufficient to shift public policies towards innovative and more cost-effective solutions.

Miguel Gonzalez-Sancho

The EU must develop a coherent vision shared amongst all stakeholders to accelerate the uptake of digital health and care innovation at scale. A vision that clearly identifies particular market-needs in the health and social care sector, that aggregates actions to overcome fragmentation and that defines joint strategies to maximise benefits for citizens, health and social care delivery systems, and the economy.

What role can the EC play?

The EC can bring new ideas and possible solutions to the table, which is what we fund in Horizon 2020 and through our support of the AAL Joint Programme. The creation of the Digital Single Market makes it possible to offer digital products and services across all of Europe under a set of common rules and regulations. In particular the proposals for a harmonised legislation on data protection and ePrivacy have been designed to protect the right to privacy of citizens and create conditions for products and services entering scalable markets.

Work on interoperability is also under way for the transfer of essential information from personal health records in digital form across borders, so that citizens can receive healthcare wherever they reside.

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In particular, our support for the AAL JP helps SMEs bring new products and services into markets across Europe. We have launched the European Innovation Partnership on Active and Healthy Ageing in order to help scale up innovation and share proven experiences and practices on innovation solutions for active and healthy ageing.

Recently our commissioner Gunther Oettinger launched a challenge to public and private stakeholders to join forces and define a common vision and develop a blueprint for the digital transformation of health and care and to mobilise key investments across Europe. It called for companies to provide relevant products and services that meet these needs, solve interoperability issues, create open ecosystems for large and small companies (using the Internet of Things for example), and clarify and skills requirements. The response has been very promising and should help to accelerate market creation and stimulate investments.

How can the market be more policy driven? To what extent should it be left to market forces?

There is a need for a common vision about how best to use the potential of innovation to scale up the market. This can then help inspire policy making at EU level (such as the DSM, medical device regulations and cross-border healthcare directive) and at national, regional and local level, by adopting guidelines and strategies for the introduction of innovative solutions and practices.

Different countries have different policy approaches to how health and care is implemented, and our EC actions can

support such policies through their different dimensions. It is clear that the digital transformation of health and care provides new potential for citizens themselves to become further engaged at an earlier stage in their health and care needs and the solutions they may require. The EU can provide meaningful market regulations which can support the provision of innovative products and services across Europe in open and fair markets, including those for providers from outside Europe as well.

There is also always a need for consumer protection, which is why we are looking at the safety of health-related apps in order to understand how we can best avoid risks while ensuring that innovative solutions can enter the market quickly.

What is your opinion on the future of the AAL?

Innovative solutions for active and healthy ageing will continue to be required for a long time to come and with the pace of the evolution of digital technologies there is also no shortage of new ideas to be exploited. I see a clear need to continue to support and help translate such ideas into real solutions with market and business models.

The discussion about the future of the AAL JP has just started and we have launched an interim evaluation of the programme with a number of experts to get strategic input for such a discussion. We will then, during the next period, carefully analyse the options for continuation together with our partners from the member states to jointly agree on a way forward. This would then become part of the overall proposal for the next EU Research and Innovation Framework programme beyond 2020.

"The EC can bring **new ideas** and **possible solutions to the table, which is what we fund in Horizon 2020** and **through our support of the AAL** Joint Programme"

The AAL Smart Ageing Challenge Prize

A stationary bike hooked up to Google Streetview and the Internet of Things wins the €50,000 top prize in the AAL's biggest ever competition. In an emotional awards ceremony, the winning entrepreneur **Roel Smolders** accepted the prize money, pledging to spend it on further investment and getting the invention to market

One of the highlights of the AAL Forum 2016 was the award of the first ever AAL Smart Ageing Challenge Prize, which saw a top prize of €50,000 going to the best Internet of Things (IOT) innovation designed to enable older people to achieve the best possible quality of life, socially and independently. From a huge entry of close to 200 applicants, the field was eventually whittled down to five top finalists, who were all given the opportunity to present their ideas to a packed plenary session.

After a nail-biting wait for these five top finalists, Activ84Health Explorer was eventually announced as the winner, picking up a cheque from the AAL's Karina Marcus, who said: "The Challenge Prize was a new event for AAL and it has been a great success in helping people focus on the importance of engaging

Roel Smolders accepting the award

Martin Morandell presents the key features of RelaxedCare

The SightPlus app assists the visually impaired

The five top finalists discuss their work on stage at the packed plenary session

with the end user in the development of a successful product and ensuring that a market is there before it is launched. Our winner has certainly done that."

Activ84Health Explorer was an idea that took root in a nursing home in Belgium and developed into a smart system that allows the housebound to cycle the world.

Jan and Roel Smolders of Activ84Health Explorer picked up the major European award at a glittering ceremony held a long way from Witte Meren, the nursing home Jan runs in Belgium and where the idea was born. They are now looking to take the product into nursing homes around Europe.

The idea emerged when Jan was looking for a way to keep his residents physically active in a safe, motivational and fun

environment. Teaming up with his brother Roel, a health technology expert at the Flemish Institute of Technological Research at the time, the two brothers went on to develop the technology that offers older people who can no longer get out and about a window on the world.

Called the Activ84Health Explorer, the smart system allows users to freely explore towns and countryside while cycling on a stationary bike from the comfort of their own home. Autonomy and the stimulation of memories are two of the core values that drive this innovative start-up company to provide physical and cognitive wellbeing for its users.

Using Google Streetview connected to a bike, cloud-based software and touch screen controls, the Activ84Health Explorer was designed to allow older people, unable to get about as they once could, to explore familiar areas from their past. As well as stimulating memories, this activity also prompts social interaction in the home, while at the same time providing a valuable exercise routine. Each user has an individual profile, which allows the platform to take into account personal physical and cognitive abilities.

The other top finalists

AlzhUp: The first service of its kind, AlzhUp allows Alzheimer's patients and their caregivers to upload memories to the cloud in the form of photos, video, music and text and catalogue them to build a clear and recognisable picture of the patient's history. All the family can share different moments through different devices — tablets, phones and wearables — and combat the effects of the illness together.

Customised therapies, based on personal memories, are also available, designed to maintain cognitive functions and prevent behavioural problems. These come in the form of mental and physical exercises and, by using gamification techniques, are designed to be enjoyable as well as a valuable in fighting the effects of the disease.

RelaxedCare: Informal caregiving is often a stressful role to take on. The RelaxedCare System aims to connect informal caregivers with assisted persons via an intuitive, user-friendly device to eliminate undue concern.

The RelaxedCare System is about conveying information, allaying fears and connecting users. Sensors in the assisted person's home record their status and the RelaxedCare System calculates their wellbeing state which is displayed as a colour on a cubed device, the main component of the system. Different colours indicate different states. If the informal caregiver wants to know more, they can get detailed info via the app, which is the second component of the system. The third component is a simplified messaging system that lets assisted people show when they are out, when they've safely returned home, or simply that they are thinking about the person at the other end.

SightPlus: SightPlus is a wearable, hands-free, vision-enhancement application that powers smart glasses to assist visually impaired people. The app enables partially sighted people to see again by combining real time video augmentation with a heads-up display technology to leverage the remaining vision of the sight impaired users. This allows them to see the faces of their loved ones, recognise signs and objects at a distance, watch TV and stay connected over the web. It also offers the ability to enlarge text and enhance the remaining sight of people with limited vision.

An important distinction from existing technologies is scalability. The technology works off any Android smartphone and doesn't require manufacturing of specific hardware or unique parts. This means the price of the sight-aid tools can be reduced significantly, making the solution much more affordable than existing tools.

TAVLA: TAVLA is a new app platform that empowers care providers to develop apps for their services and reach their customers more easily. This increases the quality of life and security of older adults in their homes.

Due to the innovative interaction model of TAVLA, the usability of apps is much more intuitive and can be personalised. This standardised interaction model has not been implemented by any other platform so far. The individual setup makes TAVLA usable for people with different limitations. This helps to make up-to-date technology usable for everyone following the "design-for-all" approach.
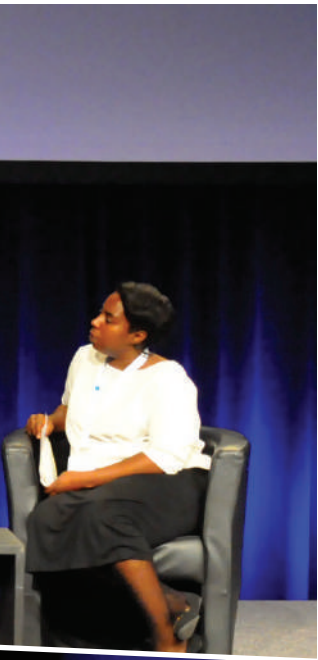
Roel Smolders holds his award

Now the company, which began life as an AAL project and has been on what Roel describes as an "unexpected journey" is on the verge of international exposure having won this prestigious award that was initiated to find the most promising product that uses the internet of things (IoT) to enable older people to live more active, fulfilling lives.

With close to 200 entries for the prize, which was run by the AAL Programme, Activ84Health beat off stiff competition, eventually being selected from the final

five, who all attended the forum. "Just being in the top five was incredible," says Roel. "I am now completely overwhelmed and a little tearful. It has been fun, but I was nervous today.

"We have already won a number of innovation awards in Belgium with our Activ84Health Explorer, but we were always uncertain whether our new technology would be appreciated by others outside of our own country as well – and being here proves it is!"

As a start-up company, the money will be a valuable prize as the business seeks to expand throughout Europe. "We already have distributors in Belgium and the Netherlands, but the exposure we get from winning the Smart Ageing Prize will certainly rocket launch us to reach many new opportunities and business

⊙ Stimulating and testing new innovations – that's our challenge

Nesta is a UK-based innovation foundation which worked with AAL in developing the first ever Smart Ageing Challenge Prize. Constance Agyeman explains the thinking behind the prize in encouraging innovative ideas to blossom to help older people live more connected, fulfilling lives using the potential of the Internet of Things

Challenge prizes are on the rise again and we see this as a good way of focusing people's attention around a challenge or issue and then encouraging them to find new types of solutions that address these.

The prizes we set up offer a reward and we set out the challenge, but we don't say how this needs to be addressed. We are prescribing what we are looking to achieve, but not who can achieve that or how they should do it – and that really does stimulate a whole new range of innovation and opens up a whole range of different thinking for ways of addressing different issues.

So, when working with AAL, we wanted to find a way of addressing some of the challenges facing our ageing population. We also wanted to embrace the new opportunities being offered by the Internet of Things (IOT) and see how these two

"When we talk about innovation, we also want people to consider adapting products and technology that are already out there in ways to address different problems"

things can be brought together to really support a more diverse, healthy and active ageing population and think about how older people could be supported socially and independently.

When setting this challenge, innovation was clearly a key criteria but we were not just talking about completely new products. When we talk about innovation, we also want people to consider adapting products and technology that are already out there in ways to address different problems. It's not always just about the new, but looking at new ways to address a problem.

partners across Europe," says Roel.

The brothers, along with partners Wannes Meert and Jesse Davis, have "tons more ideas" but will now be concentrating on their core product. "With the award behind us and the money in the bank, we are confident that this is the right product for us and we are very confident that it has a big future."

As well as providing a novel and engaging means for older people to

"I am now completely overwhelmed and a little tearful. It has been fun, but I was nervous today"

keep fit in the home environment, the Activ84Health Explorer also has applications for healthcare professionals, who can use the collected data to monitor the health and well-being of the older person.

Another key criteria was that the products had to be internet connected, but we wanted to see quality and usability embraced, too. We didn't want to see things thrown together – thought needed to go into what it was to be used and who was going to use it.

We also wanted entrants to think about the possible impact their solution would have on people's lives and the way people would actually use it and were looking for prototypes if possible. We wanted to have something that could demonstrate its potential impact.

Constance Agyeman

Also important for us was the opportunity to take a product to market. Often a range of grant programmes rely on a set of core funding whereas the challenge prizes are designed to support the innovators to think about their business models, find markets and engage with their customers. By supporting them to demonstrate the efficacy and viability of their products, we are looking to open up a whole world of opportunities for them within the market place.

Support and guidance for participants is another key part of challenge prizes. They are not simply about people giving in their idea and getting money for it if they win. They are about the journey and the development of ideas and helping to diversify thinking – and this could be support for business planning, prototyping or just understanding what is happening in the market place where your product is aimed.

While we had the final five and, ultimately, the winner of this challenge prize at the AAL Forum 2016, a key success for us is that everyone who took part in this process will have strengthened their capabilities and built their capacity to be able to continue to develop their ideas – so there was real value in taking part.

⊛ Keynote: Mauro Dell'Ambrogio

Mauro Dell'Ambrogio, the State Secretary for Education, Research and Innovation of Switzerland briefly outlined the Swiss government's strategy for Digital Switzerland, touching on the need for a vibrant private sector to drive innovation and for more cross-border collaboration to ensure the best products and services for older people are taken to market

Mauro Dell'Ambrogio

Delegates were welcomed to Switzerland by Mauro Dell'Ambrogio, the State Secretary for Education, Research and Innovation, who took to the stage at the opening plenary of the first main day of the forum to offer greetings on behalf of the Swiss government.

The State Secretary, however, also used the opportunity of addressing so many stakeholders involved in active and assisted living across Europe and beyond, to speak about the size of the challenge society faces and how Switzerland will be addressing this.

Using the latest numbers to emerge from the Swiss Office of Statistics, Mr Dell'Ambrogio asked the audience to imagine itself in a country where more than a quarter of the population was more than 75 years old and only half of the people were in employment.

"This is what the situation will be in Switzerland by the year 2045," he proclaimed. "And this situation will be similar in other countries, at least in Europe."

Dell'Ambrogio was also keen to emphasise the positives of this demographic shift, labelling the increase in life expectancy as a "pleasant phenomenon" but warned that when seen in conjunction with other factors

like a shrinking workforce and the effects of migration, European society should expect fundamental changes in the way we live together and the way we organise ourselves.

"Already today, we have to face the consequences these developments are having on our society and on our social systems," he said, suggesting that cooperation is the only way to address these challenges. "Switzerland is certainly eager to learn from other countries about how they deal with these challenges," he said, "and we will gladly share our own insights about these challenges with them, too.

"For Switzerland, the AAL Programme is an ideal platform on which we can all develop solutions together," he continued. "With participation in more than 70 projects since 2009, together with 22 other countries, Swiss players have been using this platform very actively and successfully. I am convinced we will all profit from international cooperation."

So where have we got to after eight years of developing solutions through the AAL Programme? Warming to the theme of the forum and the role AAL must play in this future, Dell'Ambrogio pointed out that it is clear that technological innovation will play an important role in how society deals with demographic ageing and in this sense, the programme is playing a vital role.

"We are now at the point where we have a great variety of technical solutions and, increasingly, these products and services are reaching the market readiness," he said. "But, the market for these types of technologies is still sketchy," he warned. "The so-called silver market is still developing and assistive technologies have often not yet found their places in it."

Dell'Ambrogio then asked the audience to consider a key question in how this silver market could be developed and the role government should play in this development. "What role should the state play in the development of technologies for the silver market and should the state do more to support such innovations?" he asked before clearly outlining how Switzerland sees this crucial question, quickly establishing that the Swiss government adheres to its established market principles when it comes to technology for the silver market.

"Innovation happens first and foremost in the private sector," he proclaimed. "In Switzerland only one third of R&D investment comes from the public sector. In this sense, innovation means success in the market, so the state is a subsidiary player and its role is restricted to providing the right environment where innovation can happen.

"For this favourable environment to flourish," he continued, "I count a good education system, with a dual path of academic and vocational training, renowned universities, excellent infrastructure, a lower-regulated job market and favourable legal and tax environment as essential."

Of course, public R&D funding has its place in Switzerland, too, and Dell'Ambrogio was keen to outline how it should be used. "It can help turn good ideas into marketable products," he said. "Ideally, however, public funding should only support research without defining it. Research topics should be defined by the researchers, and the government must not interfere at this stage.

"It is our conviction that researchers, together with their partners in the private sector, know best in what field they should conduct research, what they should develop and how they should take it to market."

"Public co-funding should go to the most promising projects without pre-setting narrow topics and without rigid timelines and rules. This should go hand in hand with state support for young entrepreneurs, start-ups, business incubators, coaching and so on."

"With participation in more than 70 projects since 2009, together with 22 other countries, Swiss players have been using this platform very actively and successfully"

Dell'Ambrogio believes that it is this policy of focusing on favourable framework conditions in the research arena that allows for additional single measures to be implemented at a government level and he used the recent government launch of Digital Switzerland, the new state strategy for the digitisation of the country. The strategy has the overarching objective of creating an "informed and democratic society and ensuring the wellbeing of our citizens".

This will create opportunities for cooperation in Switzerland for all those involved in ICT development, including all involved in active and assisted ageing, and this was something Dell'Ambrogio was keen to point out to the AAL audience.

"The federal administration is seeking an exchange and cooperation with the EU and one particular element of Digital Switzerland is particularly relevant for AAL" he said as he concluded his address. "The strategy wants to empower Swiss citizens to use more information and communications technologies in their daily lives competently. To that end, the strategy seeks to promote the digital skills of older adults and provide open access to ICT.

"Different kinds of digital inclusion projects are supported and these include the development of ICT products and services which allow older adults to live independently and securely."

Panel discussion: AAL technology for all

The second plenary session invited a panel of experts from different backgrounds to discuss the need to invest in AAL technology. Technology has the potential to decrease hospitalisation, decrease chronicdisease-related costs, help older adults to live healthier and more independent lives, and generate business and jobs within the technology industry.

Evaluating risk: how AAL can transform insurance

Stefan Loacker, former CEO of Helvetia Insurance, was in the panel to give some perspective on the issues faced by insurance companies in the modern financial climate. He initially set out to underscore his view that the ageing population of Europe has presented huge challenges to insurance. "I was responsible for a large balance sheet at Helvetia, carrying long-term savings and future pension funds for people in Switzerland and across Europe," he said. "People living longer does provide opportunities, but the reality of today's capital markets along with zero interest rates or even negative interest rates means that funding a good living after the active period of life is becoming extremely difficult. "On this front there is no good news," he continued. "Redistribution of money between the active employed and older adults will only become more challenging, and the monetary policies of today do not help at all."

These difficulties do bring with them a silver lining, however. "Active and assisted living has now become a necessity, and that means that the AAL market holds huge potential," he explained. "Technology and digitisation will play an increasingly important role as the need to bring down the cost of care programmes and infrastructure grows, because the money available will not grow."

Aside from these macroeconomic issues, the insurers themselves — especially life insurers — face huge pressure to grow capital funds and provide money for pensions that have been guaranteed. "Not only is their given business model under pressure, but they also have disruptive influences from Fintech and Insurtech companies. So after a hundred or so years of stability, innovation is now key for insurers if they want to survive this kind of disruption."

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Big data can help insurers provide more individualised proposals for customers. Information on behavioural patterns and other health related matters are consequently valuable to insurers as they allow them to be more precise in evaluating risk. Many insurers are now moving away from just paying out in case of claims and are getting more involved in terms or prevention, protection and assistance around different areas of living. Smart homes, smart mobility, and smart health are all of great interest in this respect.

In fact, most insurance companies now have their own venture funds to pay into startups. This brings them closer to where innovation is happening and allows them to use the newest technology with their clients. "Insurers are huge institutions with millions of clients, so there is big potential for rollout," said Loacker.

Loacker believes it is imperative that companies set out the business case for their technological solutions; they cannot exist just for altruistic reasons. "Insurers are looking for features that give them more precision in predicting claims in all settings," he said. "This follows into using data about external factors and then getting involved in prevention rather than waiting for things to happen and then paying out. In the lives of older adults, there are many areas which technology can help with in this respect. For example, the ability to make emergency calls and tools that help around the home can all help bring down the costs of dealing with old age.

"Any diagnostic tool that helps with early response before something escalates can help insurance companies to be better risk managers and to reduce unnecessary costs. We are already starting to see these technologies being used, and they show great promise."

However, there is a digital divide that exists between the solutions and people who have not grown up using such technology. "People who never worked before the internet was ubiquitous are unable to use many technologies and do not have the necessary infrastructure in their homes," said Loacker. "This divide needs to be bridged, otherwise the technology being developed is only theoretically helpful, but not practically."

Insurers today must remain intelligent risk managers in terms of the ageing society while always keeping in mind the zero interest capital market. Loaker believes that the forum's motto "Innovations ready for breakthrough" projects the right attitude, but innovation does by necessity take time. "The full value chain must be involved, the framework and all the participants from the providers to the end consumers," concluded Loacker. "This is not a quick process, but from what I can see at this year's forum we are moving in the right direction."

Bringing care to the home

It is a well-accepted fact in the AAL community that most older adults would much prefer to stay at home rather than go into care. Retaining independence like this improves people's quality of life and keeps them engaged with society. Béatrice Fink of Pro Senectute was on the panel in the second plenary session, offering up her insights on how the AAL Programme and society at large can help to support this goal

For the last 90 years, Pro Senectute has been providing services to people aged 50 years and upwards so that they can continue to enjoy their lives within their own four walls. It is the largest professional and service organisation for retired people in Switzerland. With around 1,600 employees and 15,000 volunteers, every year it is in contact with around 700,000 elderly people throughout the country, providing

impact that it could eventually have. "One key reason for this is that people over the age of 80 are not very comfortable with new technology. We need to become more active to remedy this situation."

Stefan Loacker

services in areas such as personal counselling, domestic help, sale and rental of aids and appliances, education and fitness.

"Everyone wants to stay at home and live autonomously and independently as long as possible," said Béatrice Fink, Pro Senectute's head of finance. "Today, 90 per cent of Swiss citizens over 65 live at home, while 57 per cent of people over 85 live at home. We conducted a study together with FHS St.Gallen and estimated that this percentage will increase to 65 per cent by 2030. Taking demographic development into consideration, that will give 404,000 older adults living at home by 2030."

This development poses major challenges to Swiss society, and similar situations will be seen in other European countries that face the same demographic development. The cost for assistance and health services at home will increase from €7.2bn to €10.5bn by 2030. It is thus imperative that solutions are found for how to finance this, as well as better and more effective methods of health prevention in order to reduce these costs.

"There will also be a huge demand for services that support older adults when they are at home," said Fink. "Switzerland already faces a shortage of skilled workers for health and elderly care services. By 2030, this problem will have increased enormously if innovative solutions are not invested in, and it is likely that a similar pattern would emerge across Europe."

With families tending to live further and further apart, no longer in the same city or even country, the issue of social isolation has become critical. Numerous studies have shown that loneliness can lead to unhappiness and consequently have a negative influence on mental health. Fink believes that the AAL Programme has the ability to address these challenges, but as yet it has not made the

Encouraging uptake of new technology amongst older adults is not easy, as Fink outlined: "It's much the same as the internet," she said. "In our daily work at Pro Senectute we see that it is really important to show older adults how the internet can benefit them in the immediate term, rather than in the long-term. They also need to be coached on how to use new things. Older adults can often harbour fears of the difficulty of using new technology, but providing them with the correct information can help to allay these fears."

A positive note is that Pro Senectute has seen the uptake of computer tuition rise dramatically in recent years, with the numbers of women getting involved rising greatly. "We also get a lot of requests for one-to-one help with technology, which involves going to the shop with them to buy the technology, setting it up, and then teaching them how to use it," said Fink. "This is an encouraging trend, and we need to find ways to finance this drive from the older population to become technologically literate."

Fink believes that if technology is going to be accepted by a generation that did not grow up using it, it must be intuitive, easy to learn, and adapted to the daily lives of the users. "It's also important to make sure that the solutions developed are not too deficit-oriented," she said. "Hearing aids are a classic example of this. It is often very difficult to convince people that they need hearing aids as they associate them with old age. This stigma and fear of using technology designed for older people needs to be overcome, and the best way to do this is to make sure the technology is designed in a way that does not suggest the person is diminished in some way. We need technology that people makes people feel empowered. This is something all AAL projects should keep in mind when designing new solutions."

Daniel Egloff – Closing remarks

At the closing ceremony of the forum, vice-president of the AAL Programme **Daniel Eglof**f gave some parting remarks to sum up the activities of the previous few days

At the very start of this forum, Rafael De Andres Medina said that this is your forum. He asked us to use it as a platform for our work, and to interact. After the several workshops I went to, and after hearing from my colleagues who attended other sessions, I must say that I think we all succeeded in doing just that. We saw vivid discussions, and we covered a great variety of aspects related to AAL and healthy and independent ageing issues. I think we all gained valuable insights, and every single one of you contributed in one way or another.

In the exhibition area we met people from many different backgrounds – we had SMEs, academia, user organisations, regional and national authorities, and we gave them a platform to show what they do, what they already have, and what they are working on. Exhibitors came from all over Europe, and also from Canada. I hope you enjoyed trying out some of the solutions that were on display.

"You should treat the AAL target group as informed consumers rather than patients"

The hackathon started on Sunday and lasted till Monday, and I think we can all agree that it was a great success. Why do we do these? This year we co-sponsored three hackathons in Europe because we consider them an alternative funding method for AAL solutions. At one of the working groups on hackathons they said something interesting: "We brought a group of tech-oriented people together, but suddenly we were a think-tank dealing with an important issue – treatment adherence. It was not about technology, but about a problem and finding a solution to it."

We also had a number of plenary sessions. In the first one – AAL technology for all – we brought industry leaders together with policy makers, which I think was a good achievement. Policy makers help in creating the right environment for AAL solutions to be produced, and the industry leaders show us the evidence of what is already there and what is possible.

You can link this to the blueprint on digital innovation for health and care transformation in Europe's ageing society. The EC unveiled it here for the first time at the forum. It's a framework for existing programmes, but it's also a new vision for healthcare systems in the digital single market. AAL has to find a place in it, because its one of the programmes that they want

Daniel Egloff

to integrate in the new policy approach. They have asked us to contribute to this and fill the blueprint with life.

The AAL Smart Ageing Challenge Prize was certainly one of the highlights. This is a new effort by AAL to support and finance innovation in the field. What is important is that not only did we select one project for the final prize, but 15 finalists also had an academy meeting in Brussels, which contributed to their development. So with this effort we reached a good number of projects and developers, helped them bring things forward.

The theme of the conference was "innovations ready for breakthrough". In her opening speech, Anne-Sophie Parent said "sometimes its about convincing older people that something is actually useful for them. How can we win them over, and inspire them to use a solution that's useful?" It has to fit their individual lifestyle, but also their social context and their family system.

Workshops made up the bulk of the forum, and they covered many different topics. Living labs were covered in more than one workshop. I think living labs are a very promising and important method to test user-oriented AAL solutions in private households, in real living situations. They have an important role in adapting existing solutions to the

"**Don't tell them they need a solution** because **they are handicapped in some way. Instead, convince them that they are smart** for choosing to use a **solution**"

actual needs, and they are the closest you can get to developing, testing and deploying AAL solutions with the users. Why is this important? Because it's not only about technology – its about people.

In closing I would like to point to a quote by Stefan Kroll. He said of the target group of AAL solutions: "You should treat the AAL target group as informed consumers rather than patients. Take them seriously, and do not consider them as a generic target. Don't tell them they need a solution because they are handicapped in some way. Instead, convince them that they are smart for choosing to use a solution." This is something that we should all consider in the year ahead of us.

AAL

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