

benefit/AAL Opportunity through Demographic Change

Project Examples

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Actively Managing Demographic Change

We're getting increasingly older. Average life expectancy in Austria is already more than 81 years. This has a range of implications on both a societal and personal level, from pension systems and healthcare to the question of how we wish to spend our later years. Here at the Ministry for Transport, Innovation and Technology we have decided to respond actively to demographic change.

In 2008 we started the benefit initiative as part of our ICT of the Future research funding programme. In this programme we search for technical solutions which enable older adults to continue living independently in their own homes. We are also involved at international level in the AAL (Active and Assisted Living) programme. In both programmes my Ministry has supported a total of 186 projects with funding of 55.6 million euros since 2008. A primary consideration is that the technical solutions are never an end in themselves, but must actively contribute to improving the lives of older adults. For this reason, all the technologies are developed jointly with those for whom they are intended, both older adults and their caregivers. The teams are interdisciplinary, ensuring that the projects also take into account ethical concerns and data protection requirements.

We have equipped a total of 500 households with assistive technologies in AAL test regions in seven federal provinces. The apartments and houses have been fitted with devices such as fall sensors, smoke alarms, automatic emergency calls, activity detectors and lighting controls, which use algorithms to detect critical situations. These test households are generating information which can be used to help older adults enjoy active and independent lives. In doing so, we are building up expertise in the field of AAL and creating jobs, particularly in structurally disadvantaged regions.

This project report provides us with fascinating insights into several of the 186 funded projects in the fields of healthcare, living, leisure, mobility, work, safety, vitality and communication. I wish you good reading.



A handwritten signature in blue ink, appearing to read 'Jörg Leichtfried'.

Jörg Leichtfried
Federal Minister for Transport, Innovation and Technology

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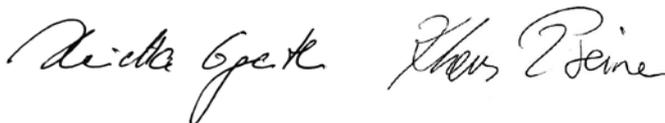
The AAL and benefit Programmes, Exemplary Models of Research Funding

Demographic change is one of the major societal challenges facing Europe. The focus is on issues such as integrating older adults into society, maintaining social networks, providing on-going care and support as well as comfort, safety and security in old age. What is needed are schemes, products and services which link new technologies and the social environment to create genuine added value. These innovative developments are designed to increase the quality of life, independence, safety and well-being of older adults, allowing them to live independently in their own homes for as long as possible.

These challenges can only be overcome by combining technical and social innovation. We have been funding the development of appropriate products, processes and services very effectively and efficiently for almost ten years now through two programmes, the European Ambient Assisted Living Joint Programme and Active and Assisted Living Programme (AAL) and the national bmvit benefit programme. These cover projects such as technical assistance systems for operating household appliances, systems for monitoring health and providing assistance in an emergency, games and interactive platforms and special indoor and outdoor navigation systems.

Both programmes follow new approaches in technology policy by focusing not merely on technology, but on solutions for actual requirements and target groups. This is achieved by the mandatory involvement of users in the funded projects. This means that subsequent users (not only those directly affected but also care and support services, for example) contribute to the development process, ensuring the usability and acceptance of the products and services developed. With their "mission-driven" format, the two programmes were exemplary models of research funding.

Their approach interconnecting national and international funding is also groundbreaking. While AAL is a multinational funding programme involving the European Union (under Article 185), benefit addresses the national level as part of the bmvit funding initiative "ICT of the Future". Once again Austria was able to adopt a pioneering role through its early and strong commitment to this topic.



Dr Henrietta Egerth and Dr Klaus Pseiner
Managing Directors of the Austrian Research Promotion Agency (FFG)



What Others Have to Say

“The rapidly rising age of the population and dramatic technological development are among the most significant phenomena of the 21st century. Rather than a “deficit model” of ageing, attention is now focused on active or resource-oriented ageing. AAL involves older people and their personal environment in the development process and in the design and functionality of technical support measures. An interdisciplinary approach and understanding of the needs and concerns of people at various stages of their lives are crucial in this context. The AAL research programme is a significant component in the successful integration of demographic circumstances and technical innovation.”

Emeritus Prof. Ilse Kryspin-Exner,
member of the Advisory Board
of the AAL Association

“The benefit and AAL funding programmes were, and continue to be, an important part of our strategic focus in research and development. They allowed us, for example, to create the necessary (international) networks spanning all disciplines and to back up our ideas with scientific studies by our sociological, medical or technological partners. Our product Fearless Life Comfort – a sensor for fall detection – was developed and created right up to market launch, originating from the FEARLESS project funded within the AAL programme. This project showed us that AAL is perceived as an important key area by care facilities and end users in Austria.”

Dr Martin Kampel, Founder of CogVis
Software und Consulting GmbH

“As a provider of mobile care and support services, we hope AAL research delivers practical results which make it easier for people to live independently at home and help us deliver efficient high quality services. The benefit and AAL programmes strengthen interaction and cooperation between users, researchers and producers and implementation of marketable solutions drawing on mutual expertise and experience.”

Mag.^a Marianne Hengstberger, Executive Director
of Wiener Sozialdienste Alten- und Pflegedienste
GmbH and Deputy Chair of AAL AUSTRIA

“Maintaining independence, self-determination and quality of life is a key factor in successful ageing. The AAL research programmes investigate what support modern technology can offer and so make a valuable contribution to tackling demographic change. The AAL AUSTRIA innovation platform particularly values the expertise built up through the AAL programmes. This includes studies relating to general AAL issues as well as experience gained from implementing initiatives, especially in the test regions. This knowledge – in some cases processed in working groups – is passed on to the community and serves not least to better integrate the many different stakeholders.”

DI Uli Waibel, Secretary General of AAL AUSTRIA –
Innovation Platform for Intelligent Assistance in Daily Life

Opportunity through Demographic Change: The benefit and AAL Programmes

Population ageing is a worldwide phenomenon. The number of older adults is higher than ever before, both in absolute figures and as a proportion of the total population. And life expectancy is continuing to increase.

At an individual level these extra years are seen as a boon and we want to make the most of them in the best possible health. From an economic viewpoint, rising life expectancy means that there will be more older people in future who will spend an increasing period of their lives in retirement; that the ratio of working to retired people will continue to change and the proportion of retired people will grow; and that demographic change will necessitate an increase in age-related public expenditure.^[1] The silver economy aims to offer older – sometimes very financially strong – people appropriate and attractive programmes.

Demographic change has been identified and addressed for some time, both in Europe and also at a national level, as one of the grand challenges facing society.^[2] Seizing and exploiting the opportunity provided by demographic change – this is the aim of the R&D&I^[3] programmes benefit and AAL^[4]. The idea is to develop applied market-oriented solutions, based on information and communication technologies (ICT), for the target group of older people. These products, services and systems not only cover the area of health and care in the sense of ICT-supported care and support services including health monitoring but also the private lifestyle sector where fitness tracking, games and the like are offered. As an intelligent living environment the smart home can respond to the wishes and requirements of older occupants: while comfort and lifestyle elements are a primary concern of younger and active members of the silver age generation, as their limitations increase the need for support and security take on greater significance. Communication and social inclusion often play an important part in all spheres.

The national benefit programme and the transnational AAL Joint Programme were launched in 2008 and are now part of the "ICT of the Future" funding initiative of the Austrian Federal Ministry for Transport, Innovation and Technology (bmvit).

Between 2008 and 2016, 55.6 million euros worth of funding were allocated to Austrian partners for 186 national and European projects within the benefit and AAL programmes (see figs. 1, 2). The benefit national funding programme accounted for 106 projects with funding totalling 21.4 million euros; within the AAL programmes 80 projects involving Austrian partners and/or Austrian consortium leaders were approved with funding totalling 34.2 million euros. Since the AAL programmes are co-financed by the European Commission, 15.3 million euros of funding comes from the EU.

Fig. 1
Number of projects funded under the benefit and AAL programmes, 2008–2016

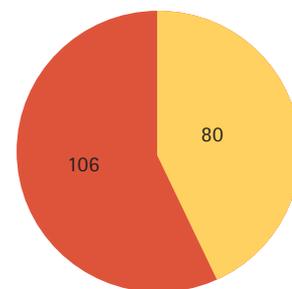
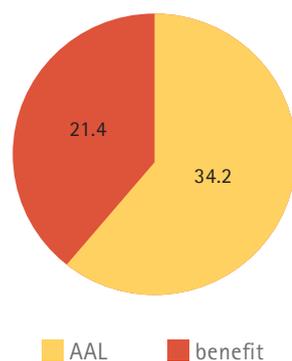


Fig. 2
Funding sum in the benefit and AAL programmes in million euro, 2008–2016



^[1] Cf. European Commission, The 2015 Ageing Report. Economic and Budgetary Projections for the 28 EU Member States (2013–2060), European Economy 3/2015, online: http://ec.europa.eu/economy_finance/publications/european_economy/2015/pdf/ee3_en.pdf, last accessed on 13 April 2017.

^[2] See <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/societal-challenges>; last accessed on 13 April 2017.

^[3] R&D&I stands for Research & Development & Innovation.

^[4] AAL stands for Ambient Assisted Living. The European research programme based on Article 185 of the Treaty on the Functioning of the European Union was called Ambient Assisted Living Joint Programme in the first term 2008–2013; the name was changed to Active and Assisted Living Programme for the term 2014–2020. The two programmes are collectively referred to as "AAL programmes".

The innovative approach behind benefit and AAL lies in bringing together different groups of end users – older people as well as groups which, for instance, are responsible for providing or financing care and support services – in consortia with partners from business (see fig. 3). The aim is to develop solutions which are desired, needed and used through joint project work. Research institutions contribute important expertise in this context. End users are involved in the programmes and research projects at an early stage in order to improve the usability of the products and services and thus to increase older adults' acceptance and readiness to adopt them.

Fig. 3 Innovation approach benefit/AAL

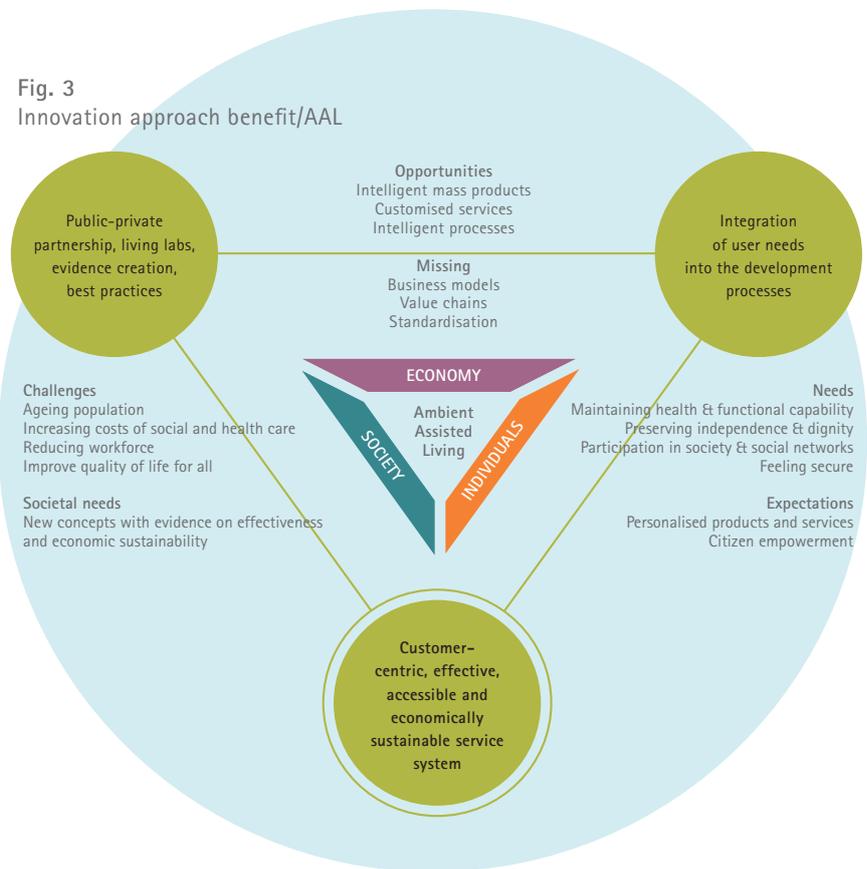
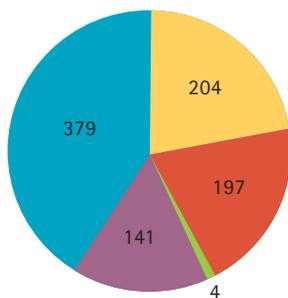


Fig. 4 Submissions according to the type of organisation in benefit/AAL, 2011–2016



In line with the AAL innovation approach, providers of so-called services of general interest – in other words, organisations offering care and support services, for example – play a major part in both programmes as participating organisations (see fig. 4).

- Research institutions
- Tertiary institutions
- Intermediary institutions incl. professional associations
- Other institutions incl. services of general interest
- Businesses incl. services of general interest

The National benefit Programme – Funded Topics

The benefit national R&D&I programme promotes the development of products, systems and services based on information and communication technologies which help maintain and improve the quality of life of older adults. This should allow the target group to live within their own four walls (including in the wider sense) as independently as possible for as long as possible. The benefit funding programme supports innovative and application-oriented projects in which businesses, research institutions and providers of services of general interest cooperate, where possible actively involving end users. Thorough investigation of actual changing needs associated with the growing elderly population, as presented in the project applications, and also consideration of ethical aspects play a central role in the funding of these research projects.

While numerous small projects and studies which helped to build up a knowledge base and establish the R&D&I community in this subject area were backed at the start of the programme, the focus increasingly shifted to larger projects in the form of test regions from the 7th call (2011/2012) onwards. To provide the best possible support for the innovative capacity of Austrian businesses, part of the benefit programme's budget has always been earmarked for funding relatively broad-based projects. The intention is to help businesses develop solutions in accordance with their corporate strategy which involve ICT-based products, systems and services for older adults. In line with this approach, a diverse range of topics are included in the benefit programme (see fig. 5).

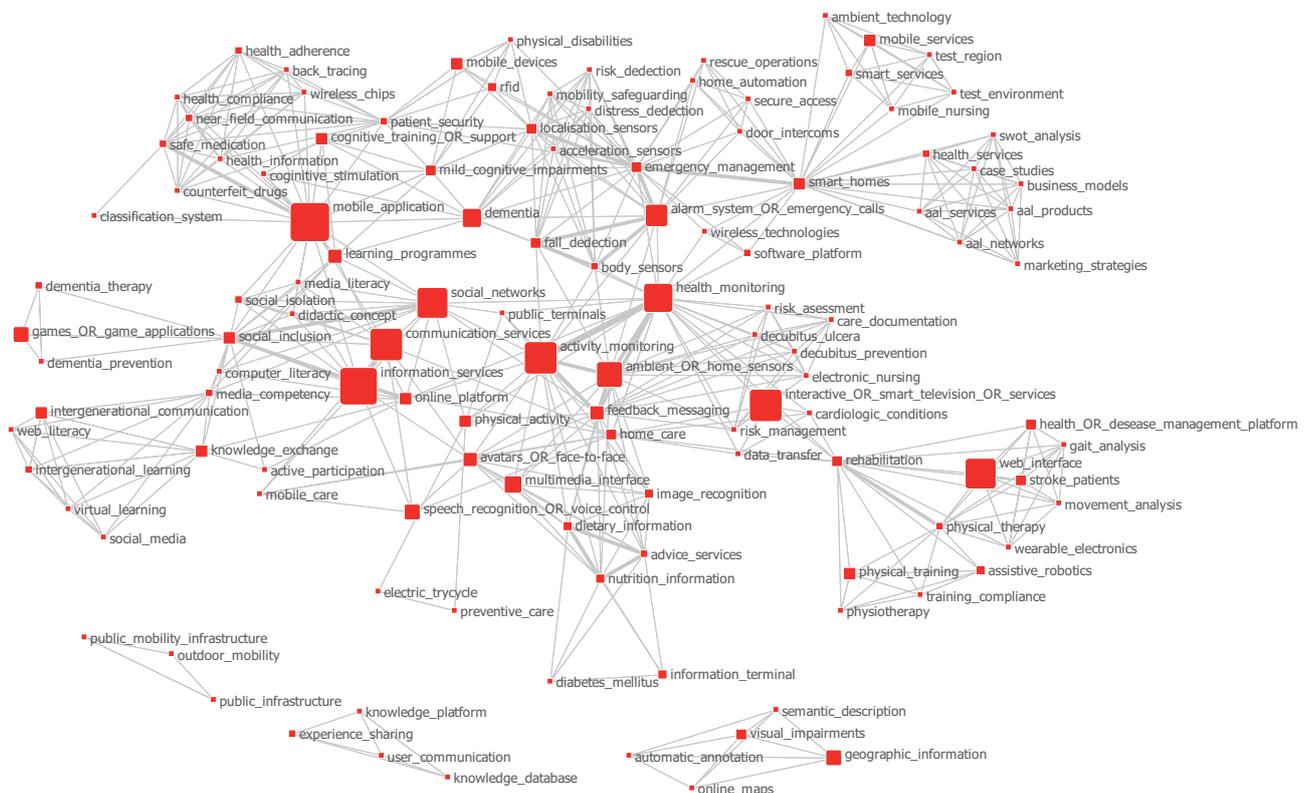


Fig. 5
Network of keywords for benefit projects, 6th to 8th call (2010–2012)

Involvement of End Users

End users (older adults and their relatives, providers of services of general interest, NGOs, interest groups, etc.) play an important part in the benefit and AAL programmes and are involved from the conception phase of the project right up to its completion. This ensures that solutions address real wishes and needs and are consequently considered useful, helpful and attractive and accepted by consumers. However, commercial care and support facilities or other end user organisations are also extremely important in marketing solutions after completion of the project as they are often the ones who provide new services based on the ICT solutions developed and offer them to older adults.

There is no doubt that ethical factors also play a significant role in the market-oriented development of ICT-based solutions for older adults. Ethical factors must be considered both as regards the planned products, systems and services but also in terms of involving people in the course of the project. These ethical factors cover issues of human dignity, protection of privacy and data protection as well as honesty as regards risks which the projects might involve, not least because the solutions are still in the development stage. Moreover it is also essential to assess the social implications of the results of a proposed R&D&I project, in terms of personal safety and security, privacy, human dignity or the scale of planned data collection.

Which Projects Are Included in This Brochure?

This brochure offers an insight into some of the projects funded so far under the two programmes. For reasons of currency, it includes only selected projects which started in 2011 or earlier.

benefit Projects

First the six test regions so far funded in the benefit programme are described to give an impression of the latest national activities in this area. Then a further four national projects are presented involving smaller-scale cooperative initiatives which attempt to meet very specific goals. The two studies presented address the fundamental issues of categorising AAL solutions and also the role of end user organisations when developing business models.

AAL Projects

Ten projects coordinated by Austrian partners were selected from the range of projects with Austrian participation funded under the AAL programmes.

Additional Projects from the "ICT of the Future" Initiative

Finally, further ICT-related funding activities are represented by two projects from other programmes of the "ICT of the Future" funding initiative, one national and one at the European level.

The benefit and AAL Programmes Have Unique Features Which Are Not Replicated in Any Other Programmes

Austrian involvement in the Ambient Assisted Living Joint Programme (AAL) was evaluated in 2016. The following interview with Anton Geyer, who was responsible for the evaluation, examines several aspects in more detail.

What makes the benefit and AAL programmes different from other research and development programmes you have evaluated?

Two aspects of this programme make it stand out. The first is the focus on end users. There have long been calls to include users in development processes; this approach is grounded in innovation theory and finds application in countless industry-related programmes. The focus in the AAL and benefit programmes is not just on users in the sense of consumers and their needs; it goes further, because the programme is designed to help solve a key societal problem.

A second noteworthy feature is that the benefit and AAL programmes are heterogeneous in their objectives. Two dimensions above all converge in these programmes: the silver economy, and the social/societal dimension of creating adequate provisions for ageing and raising awareness. Until now the programme has not been able to meet the expectations placed on the silver economy as was hoped, but it has clearly succeeded in generating greater awareness about the subject of ageing and ICT development.

Do you not see any overlap between the silver economy and the societal component? Could it be that the societal aspects develop more quickly

than the market, but that overall they go into the same direction?

I think you have the right idea. However, during the evaluation I gained the impression that different narratives emerge when addressing these aspects separately. Those who say AAL technologies must be in the industrial mainstream very easily exclude users and the user perspective as points of reference. The users themselves are then often no longer considered, and merely assigned the role of typical consumers. That is also a legitimate viewpoint, but one in which the claims of the programme to address social/societal needs begin to unravel. The benefit and AAL programmes basically follow an interesting approach, but during the evaluation I found countless indications that these aspects still do not overlap sufficiently.

The focus in the AAL and benefit programmes is not just on users in the sense of consumers and their needs: the programme is designed to help solve a key societal problem.

Two dimensions above all converge in these programmes: the silver economy, and the social/societal dimension of creating adequate provisions for ageing and raising awareness.

Is an overlap necessary? Older people are a very heterogeneous group, but they share the aspiration of experiencing social inclusion and benefiting from the possibilities offered by ICT. Why can't both aspects contribute to the common aim of the AAL programme, namely enhancing quality of life and stimulating the economy?

Yes, that is certainly possible. I agree that it is basically a good approach to address both aspects. However, I also see the danger that the programmes would be ground down by these two conflicting demands.



Anton Geyer (inspire research Beratungsgesellschaft) in conversation with Gerda Geyer (FFG)

It is certainly easier to keep the right balance at national rather than European level.

Should both be made explicit? And stress both the silver economy market and the social service providers as lead customers, for example?

I don't know which dynamic we can expect at the European level in future, but I would see this as a good way forward for Austria. Also within the scope of a transnational or European programme: there are only a few businesses in Austria today in a position to develop innovative solutions for the silver economy. In the national evaluation we also highlighted that expectations for the silver economy have not been met. Another factor for the silver economy is to remove the label of old age from the products in order to eliminate the "old age stigma". That is often the challenge for designers – developing products and services suited for older adults but without making the users feel old. This is where the largely unexploited potential of the silver economy lies.

What advantages do you see in involving social service providers and end users in projects?

In Austria the AAL sector is primarily dominated by research establishments and a few companies. All interviews that I conducted in Austria have shown

that, for research establishments and companies, end user involvement has the essential function of better understanding the problems that users face. This is a factor which often fails to receive

sufficient attention in research processes. That's why the AAL programme is frequently mentioned as a positive example of a greater focus on the user in R&D programmes in order to include the user perspective in the programme design. The task is to see what works or doesn't work from the user perspective and to test R&D ideas at an early stage. That has worked very well in the benefit and AAL programmes.

Another factor for the silver economy is to remove the label of old age from the products in order to eliminate the 'old age stigma'. That is often the challenge for designers.

In the evaluation you suggest more strongly addressing the key stakeholders in the health, social and care sectors as target groups. What could be expected from this, and how could it be managed? What should be done?

AAL was never intended to be a conventional research programme. The implementation, the short time-to-market, distinguishes the programme from other user-oriented programmes which are further from the market. The secondary and tertiary end users have a very important role as implementers; without them there is no implementation.

The secondary and tertiary end users have a very important role as implementers; without them there is no implementation.

In your view, could innovative public procurement for benefit/AAL be a sensible tool at the present time?



Hospitals and their operators might include innovative procurement in their tendering processes. The challenge here is what happens if the procurement project is a failure, or the costs significantly overrun the budget? My impression is that innovative procurement works well in situations where large resources are deployed, for example in the military and space industry. Effective models still need to be identified for innovative public procurement in the AAL sector.

Have you not found any leads in your discussions and analyses?

No. It is a question, but during the evaluation I wasn't given any indications of how to make innovative procurement operational within the scope of the benefit and AAL programmes.

Should the benefit and AAL programmes take a different direction in order to generate greater market success? What should be done?

In Austria there are still few companies doing significant work on this type of technological development. The international dimension is very important for many Austrian partners; international partners bring expertise which is not available here because of the size of the country and the limited number of stakeholders.

The international dimension is very important for many Austrian partners; international partners bring expertise which is not available in Austria.

You should continue to focus on the strengths of the programme, and they are primarily the societal benefits and the focus on end users.

Businesses were set up or spun off comparatively often over the course of the projects and afterwards. How do you interpret this? Furthermore,

quite a lot of the companies supported by the benefit and AAL programmes have gone bankrupt. What does that tell us about the AAL market? Or is it just a coincidence?

No, it's not a coincidence. AAL is a young and dynamic market. There are many stakeholders who perceive new opportunities here and so establish their businesses. And as is typical of tech ventures, many companies disappear again. A very high proportion fail, and many go

bankrupt. That is not a criticism of the programme, it is the natural consequence of the fact that a new market has been identified.

Do you have any take-aways for future programme development?

You should continue to focus on the strengths of the programme, and they are primarily the societal benefits and the focus on end users. This creates considerable added value, even in the case of technology programmes. It's a balancing act, but with a clear socio-political objective. And the idea of making both aspects – the silver economy and the societal dimension – more transparent, and presenting

both strands more explicitly, could be followed up. The programme has clearly unique features and is



not replicated in any other programmes – not in Horizon 2020 and not in softer policy coordination measures running parallel with it.

Thank you for an interesting conversation.

The interview with Anton Geyer was conducted by Gerda Geyer, FFG Programme Manager, in Vienna on 26 January 2017.



Profile: Anton Geyer conducted the evaluation of Austria's participation in the AAL Joint Programme on behalf of the Federal Ministry for Transport, Innovation and Technology (bmvit), and was a member of the European Commission's expert group for the interim evaluation of the AAL2 programme. Anton Geyer was appointed Managing Director of inspire research Beratungsgesellschaft m.b.H. in 2016 after having worked as an evaluator for the Technopolis Group Austria for the previous twelve years.

A person wearing a blue short-sleeved shirt is shown from the side, looking at a computer monitor. The monitor displays a data dashboard with various charts and tables. The entire scene is overlaid with a dense, semi-transparent layer of white binary code (0s and 1s) that appears to be falling or floating. The background is a deep blue color.

benefit



Ageing with Smart Quality of Life

The SMART VITAALITY project tests an integrated AAL system to support the quality of life and independence of older people in everyday life in one hundred households in Klagenfurt, Villach and Ferlach.

The overall desire for a high subjective quality of life and independence is one of the key common denominators concerning the needs of the older generation – despite the great diversity in this target group. New technologies are increasingly opening up new opportunities to shape our everyday life, and especially to support the quality of life and independence of elderly people. Correspondingly broad marketing success has not yet been achieved and associated financial models for such AAL technologies are still lacking and depend on a range of mutually influencing factors such as usability, functionality, acceptance, impact and, last but not least, financial feasibility.

Integrated AAL System in a Smart City Environment

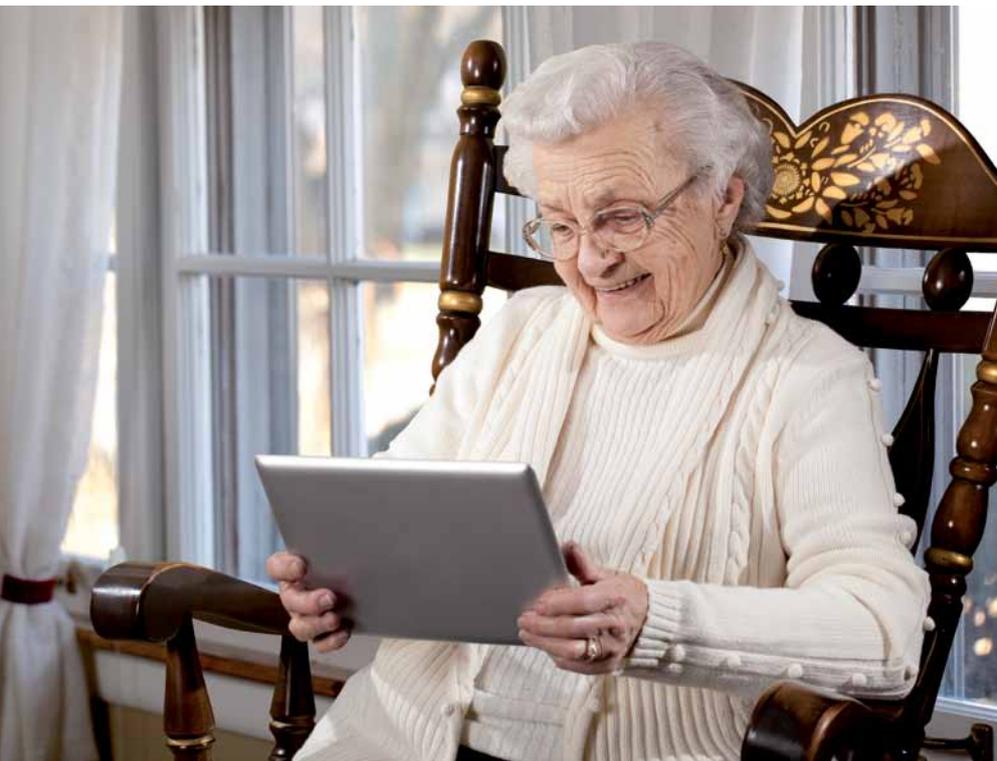
The SMART VITAALITY project involves the long-term testing of an integrated AAL system in one hundred senior households in the smart city environment "Health, Inclusion and Assisted Living". The SMART VITAALITY system offers future users utility-based, expandable, modular and intuitive user-friendly services that can be readily integrated in existing everyday processes. These functionalities are designed to maintain quality of life in terms of well-being, health and social inclusion on a long-term basis. This should allow seniors to live longer, independently and more contentedly in their own home environments.

SMART VITAALITY has been developed in a consistent user-centred approach, integrating a range of functionalities developed together with the target group, including health management (telemonitoring including servicing through an integrated medical care centre, alarm function), lifestyle monitoring (objective recording of ADL parameters, support in the active organisation of everyday life) and social inclusion and community services (serviced provision of information, networking inside the target group and participation support).

The SMART VITAALITY components should not be seen as purely technological solutions, but will be offered in close cooperation with members of the medical profession, associations and communities. A tablet (interface and control for all functions, video telephony) and a smartwatch (pulse measurement, recording of physical activities, alarm function) are integrated into the system as user interfaces.

Demonstration and Evaluation

The SMART VITAALITY system will be evaluated in one hundred senior households in the Carinthian urban triangle of Klagenfurt–Ferlach–Villach over the course of one year. This serves to assess the influences on subjective quality of life, individual benefits and potential obstacles in dealing with new technologies and to carry out a socio-economic analysis based on the results.



SMART VITAALITY system, integrated in everyday life

In addition to acceptance and usability evaluations, the model also includes controlled impact analysis of subjective quality of life and subsequent socio-economic potential analysis. The results of the study should form a substantiated basis for transforming individual components and services into a (regular) funding model, as an important part of a sustainability strategy.

The combination of urban settlements containing 10,000 to 100,000 inhabitants – a small town (Ferlach), a medium-sized city (Villach) and a large city (Klagenfurt) – is representative of the Austrian urban landscape and offers additional possibilities for comparison between different urban environments.

Introducing New Technologies and Putting Them to Sustainable Use
SMART VITAALITY aims to provide sustainable evidence of effectiveness and cost efficiency of both the overall system and its single components. It is clearly based on an established, demand-oriented theory, and is not purely technology-driven. Its main goal is to maintain quality of life on a long-term basis. This goal is embedded and reflected actively in a socio-economic context.



SMART VITAALITY system cluster: health management, lifestyle management and social inclusion

A further goal of test and pilot regions is to implement "educative" and useful applications of AAL. The SMART VITAALITY project gives seniors and AAL-relevant stakeholder groups (quadruple helix) an insight into the technology used. Potential and actual challenges should be explained and communicated in an easy-to-understand manner in order to build and strengthen awareness of this topic. The project is also expected to stimulate the AAL research and marketing environment and interdisciplinary geriatric and gerontology research, both at regional and transregional level.



Project Title

SMART VITAALITY – Kärntner Modellregion für AAL und SMART Living Technologien [Carinthian Model Region for AAL and SMART Living Technologies]

Programme

benefit

Consortium Manager

Carinthia University of Applied Sciences

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Further Project Partners

Hilfswerk Kärnten Service GmbH

ilogs mobile software GmbH

JOANNEUM RESEARCH

Forschungsgesellschaft m. b. H.

MedCubes GmbH

Project Duration

2017–2019

Project Website

www.smart-vitaality.at

Taalxonomy

T01 Health & Care (main category)

T03 Safety & Security (further category)

T06 Vitality & Abilities (further category)

Integrated System Solution with Added Value

The project WAALTeR – Wiener AAL TestRegion [Vienna AAL Test Region] combines existing prototypes and solutions to build an integrated AAL system solution which is tested and evaluated in 83 households in Vienna.

The WAALTeR project responds to demographic and health policy challenges and the ubiquitous digitisation of everyday life. In order to enable older people to live a self-determined life in their familiar environment with a high quality of life, WAALTeR develops service packages tailored to the needs of users, which open up opportunities for the three areas of social integration, security and health, as well as in the cross-cutting context of mobility.

The focus is on prevention and care strategies in the urban context and on practical, integrated solutions tailored to the needs of the users and their physical and social environment. To this end, existing technical applications are adapted and integrated into a system solution to leverage synergies. Thus, skills as well as the motivation for an active, self-determined life are promoted to increase personal safety and health as well as improving social integration and social participation.

Practical Application and Evaluation of AAL Technologies

The holistic approach pursued by the WAALTeR project focuses on user needs and the added value of AAL solutions and examines future AAL applications in Austria's largest urban area. The technologies and services used are already available as prototypes or as commercial products at the start of the project and are comprehensively evaluated and used in the project for the first time. The benefit is scientifically investigated in an experimental evaluation and is thus given increased marketing potential.

WAALTeR relies on solutions that meet the diverse, specific requirements of older



WAALTeR offers an integrated AAL system solution for elderly people.

people: the integration of individual and partial solutions or prototypes in a networked system solution, which can be integrated into existing care processes and tested for their product or target group suitability. Each senior citizen can thus receive the appropriate form of care for them and remain in their familiar environment for as long as possible. Independence, self-determination and quality of life can thus be maintained until old age. The creation of a range of opportunities tailored to the user is designed to counteract the risk of isolation, physical and psychological deterioration as well as the anxiety and insecurity of older people in everyday life, thus increasing quality of life.

Cost-Effective and Sustainable Test Facilities for AAL Solutions

The WAALTeR approach with strong stakeholder orientation and the involvement of potential purchasers (for example, relatives or organisations) enables efficient and market-oriented testing. The focus is on affordability and sustainability, so

that social obstacles to obtaining a product can be mitigated in advance. The ease of use and added value of the devices and services is taken into account from the user perspective.

The broad profile of the WAALTeR project consortium covers the products (SMEs/research), the financing of care services complying with the social welfare standard (Fonds Soziales Wien) and, to an extent, the already existing and still expanding sales channels for the products (Wiener Sozialdienste Alten- und Pflegedienste, Johanniter) in the Vienna AAL test region.

Long-Term Integration of Users

The users are actively involved throughout the project: they are informed and recruited in interactive information cafes, local media, neighbourhood networks and the social service providers and are involved, as ambassadors, in the dissemination of the results. Relevant stakeholders – political decision-makers as well as the WAALTeR advisory board members – are also involved throughout the duration of the project and act as multipliers for the replication of the results.

Starting in 2018, 83 Viennese households will be equipped with the integrated WAALTeR system (tablet system solution). In addition to basic services, they can also use supplementary AAL services and technologies from the social, health and safety services packages (for example,

indoor fall detection, telemonitoring or fall prevention). Together with 35 control users, they are part of the experimental evaluation study, which will be carried out over a period of eighteen months. WAALTeR primarily addresses active users in heterogeneous housing and care situations in the urban environment and supports them in the context of their physical and social environment. In parallel with the test houses, a sample apartment will be set up at the end of 2017 at the Johanniter Schichtgründe residence, which will be accessible to interested parties on request.



Telemonitoring at a WAALTeR information cafe



Project Title

WAALTeR – Wiener AAL TestRegion
[Vienna AAL Test Region]

Programme

benefit

Consortium Manager

TINA Vienna GmbH

Project Coordinator

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Further Project Partners

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Bernhard Rupp

CogVis Software und Consulting GmbH

Fonds Soziales Wien

FragNebenan GmbH

ilogs mobile software GmbH

Johanniter Österreich Ausbildung und

Forschung gemeinnützige GmbH

Microtronics Engineering GmbH

Vienna University of Technology

Wiener Sozialdienste Alten- und

Pflegedienste GmbH

WPU Wirtschaftspsychologische

Unternehmensberatung GmbH

Project Duration

2016–2019

Project Websites

www.waalteR.wien

Taalxonomy

T06-01 Physical Abilities (main category)

T06-02 Cognitive Abilities (further category)

T06-03 Social Skills (further category)

T08-03 Communication (further category)

T08-04 Organisation (further category)

T01-02 Body and Vital Data (further category)

T01-03 Telecare and Telehealth

(further category)

T03-03 Falls (further category)

T03-05 Emergency Management and Alarms

(further category)

T04-03 Travel Information and Navigation

(further category)

T07-03 Culture (further category)

Effective Solutions for Remaining Living at Home

The RegionAAL project implements integrated AAL solutions in one hundred test households in Styria, mostly in urban regions, and evaluates their effectiveness scientifically.

The aim of RegionAAL, the Styrian AAL test region including the urban centres of Graz, Leibnitz and Deutschlandsberg, is to help older adults live for longer in their own surroundings. This will be achieved through the implementation of information and communication technologies that are likely to be actually accepted and used by the target group. In order to meet this requirement, needs will be assessed via evidence analysis. Existing technologies will be adapted, extended and integrated into around one hundred households. Finally, the effectiveness of these assistance systems will be assessed in a one-year scientific evaluation.

Increased Quality of Life as a General Aim for Society

The aim of many older people is to remain in their own environment, enjoying the highest possible quality of life for as long as possible. This is also a societal

aim which is echoed by many official bodies and organisations such as the World Health Organization (WHO), the Organisation for Economic Co-operation and Development (OECD) and the European Union. However, the ageing process is typically associated with an increase in, and worsening of, both physical and mental chronic conditions including diabetes, high blood pressure and depression. This multimorbidity among older people is often accompanied by social isolation and associated with real or perceived need for help and assistance. This leads to a rising need for external support, in terms of personal care or social needs, in order to be able to remain living at home.

Scientific Evaluation of Effectiveness

Under the term Ambient Assisted Living (AAL), many innovative ICT technologies have been developed to support older people and tested on a small scale within

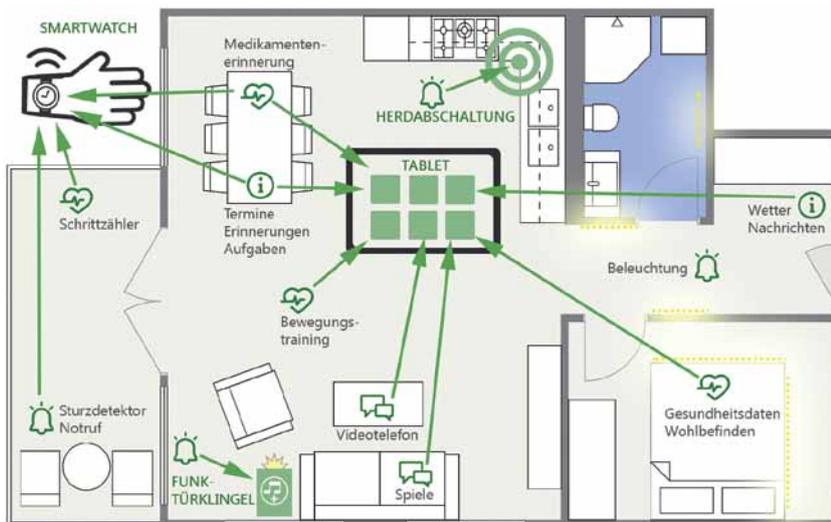
research projects; however, only a few technologies have been successful so far. Why have relatively few of these technologies been successful? Could one reason be that they were not researched and developed with the specific needs and requirements of this particular population group in mind?

The aim of RegionAAL is to take existing ICT elements, which are acceptable to this target group and have been proven fit for use, to develop them further and integrate them into a coherent structure. The technology is then to be implemented in a study setting involving a scientific evaluation of effectiveness. RegionAAL integrates already available technologies which have been developed for a general population and implements them for older people in order to enhance their quality of life and allow them to remain in their own homes longer. The technologies were chosen such that they can be used beyond the timescale of the project; an important point for those health service providers participating in the study.

Homes, mostly in the urban area, will be equipped with supportive technologies and functions (for instance, video communication, reminders for structuring of daily activities, fall detection or improved room lighting with the help of tablets and smartwatches) that have been identified through needs and evidence analyses. During a one-year scientific evaluation phase, acceptance and effectiveness (including the impact on objective and subjective health status and well-being) will be assessed.



The choice of products available in the RegionAAL solution



Components of the RegionAAL system

Reducing the Burden for Caregivers and Increasing Care Time

Supportive technologies are only one aspect. Providing care and support through established social structures (friends and family) and formal care structures is essential. Personal contacts must not be replaced by technology. On the contrary, the aim of RegionAAL is to develop and implement technologies which not only support personal contacts but strengthen them by allowing time and resources to be diverted to other aspects of care and interaction. AAL technologies can potentially contribute to reducing the burden on informal caregivers (mostly women) and thus allow a longer stay in familiar surroundings.

Desired results of the RegionAAL project are: (1) an evidence-based definition of the target population in terms of a clearly-defined need and the associated identification of types of AAL technologies that are likely to be effective in

meeting this need; (2) to find supportive technologies for those with particular needs that can help improve or maintain quality of life thus contributing to a delay in entering institutionalised care; (3) to establish technological solutions for regional care providers so that technology and care services can be implemented in relevant facilities; (4) to generate evidence of the acceptance of technologies and the degree to which they contribute towards solutions for the problems identified, via a scientific evaluation; (5) an exchange of information with other AAL regions to enable mutual learning.



Project Title

RegionAAL – AAL-Testregion im Raum Graz – Leibnitz – Deutschlandsberg [AAL Test Region in the Area of Graz–Leibnitz–Deutschlandsberg]

Programme

benefit

Consortium Manager

JOANNEUM RESEARCH

Forschungsgesellschaft m. b. H.

Project Coordinator

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Further Project Partners

Geriatrische Gesundheitszentren der Stadt Graz

PWH Kirschallee GmbH

Resch Elektrotechnik GmbH

Sozialverein Deutschlandsberg

Project Duration

2015–2018

Project Website

<http://regionaal.at>

Taalxonomy

T01-02 Body and Vital Data (main category)

T01-03 Telecare and Telehealth

(further category)

T01-05 Nutrition & Diet (further category)

T01-08 Drugs & Pharmaceuticals

(further category)

T02-03 Light (further category)

T03-01 Damages and Hazards

(further category)

T03-03 Falls (further category)

T03-05 Emergency Management and Alarms

(further category)

T06-01 Physical Abilities (further category)

T06-02 Cognitive Abilities (further category)

T07-02 Entertainment and Media

(further category)

T07-06 Games (further category)

T08-01 Information and Knowledge

(further category)

T08-03 Communication (further category)

T08-04 Organisation (further category)

Living Independently in Your Own Home

How can apartments be improved such that older people have the possibility to live more independently and stay as long as possible in their own homes? The ZentrAAL project – Salzburger Testregion für AAL-Technologien [Salzburg Test Region for AAL Technologies] aims to test innovative technologies.

In recent years, various technological solutions for supporting elderly persons have come onto the market. Most technologies focus on comfort and consequently on functionalities to support people in their everyday life. By taking over simple activities, however, they may cause functional skill losses and increase care needs.

Learn to Use Technologies While Still Healthy

The ZentrAAL project focusses on the development of technology-enabled services in order to prolong independent living by older people by maintaining their functional skills and current health status. Elderly people are supported in managing their everyday life on their own. In order to reach this long-term goal, ZentrAAL addresses older people who are still healthy and active (with very little or no need for support). The project aims to make AAL technologies accessible to these people by demonstrating the benefits of AAL usage. Consequently, they will be prepared to use these technologies when they need them at a later stage, and make the best use of them according to their needs.

Feel Safe and Fit in Everyday Life with meinZentrAAL

The meinZentrAAL information system developed within the project includes several systems and components already available on the market. The development focused on user-centred design, usability, cost-efficiency, expandability and easy upgrade options. The meinZentrAAL solution provides functionalities

with respect to safety, fitness, community, apartment automation, appointments and entertainment. The emergency SOS button enables the user to call the Hilfswerk emergency centre day and night. The silent alert is another safety feature. Smart home sensors are installed in the user's apartment, which can detect critical situations and raise an alert according to individual configurations. The fitness functions contain individual exercises provided as videos with different levels. Additionally, it is possible to record movement and other activities as well as vital parameters automatically or manually. Users have thus the possibility to control their physical activities and realise changes in their vital parameters.

The community functionalities are particularly geared to users and employees of sheltered housing schemes or similar accommodation in order to improve networking and strengthen the community. The apartment functionalities combine several smart home components such as window and door sensors, an electronic door guard, a stove monitoring system and a wireless light switch. The calendar



The meinZentrAAL solution supports elderly people in their homes.

feature can be used to organise appointments and configure reminders. The entertainment functions were mainly implemented to familiarise the users with the system in a playful manner. Therefore, the system provides games, Internet access, regional newspapers, camera and gallery, weather forecasts and, if desired, Skype and e-mail. The meinZentrAAL solution can be used at home and outside via a tablet or a smartwatch.

The integrated meinZentrAAL solution in use.



End User Acceptance through Lead User Workshops

In order to ensure good usability and end user acceptance of the developed services, older people have been involved in all the relevant project phases from the beginning. Therefore, so-called lead users were recruited, who were actively involved in the development of the system by participating in workshops. The requirements were gathered in three iterative lead user workshops. Additionally, two workshops were conducted with employees of sheltered housing schemes operated by Hilfswerk Salzburg. During the system development phase, the lead users were involved in the user interface design. Paper prototypes were used to create and discuss possible interactions.

In May 2016, meinZentrAAL was installed in over sixty households with people living in sheltered housing schemes or similar accommodation in the province of Salzburg. These people will be testing the system for fifteen months. Weekly "ZentrAAL Café" meetings were organised during the first ten weeks, where users were trained to use the system and had the opportunity to clarify questions.

The field trial serves to evaluate the impact, effectiveness and user acceptance of meinZentrAAL using questionnaires and interviews. In addition to the test group, a control group of equal size will be interviewed about quality of life aspects. The field trial will be concluded in July 2017.



Project Title

ZentrAAL – Salzburger Testregion für AAL-Technologien [Salzburg Test Region for AAL Technologies]

Programme

benefit

Consortium Manager

Salzburg Research
Forschungsgesellschaft m. b. H.

Project Coordinator

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Further Project Partners

Carinthia University of Applied Sciences
Hilfswerk Salzburg Gemeinnützige GmbH
ilogs mobile software GmbH
Paris Lodron University of Salzburg
Salzburg AG für Energie, Verkehr und Telekommunikation
Salzburg Wohnbau GmbH
Vienna University of Economics and Business

Project Duration

2015–2017

Project Website

www.zentraal.at

Taalxonomy

T01-02 Body and Vital Data (main category)

T02-06 Entrance Control (further category)

T03-01 Damages and Hazards

(further category)

T06-03 Social Skills (further category)

T07-02 Entertainment and Media

(further category)

T07-06 Games (further category)

T08-03 Communication (further category)

T08-04 Organisation (further category)

Individual Bundled Solutions for the Elderly

The project WEST-AAL – AAL Testregion Westösterreich [AAL Test Region Western Austria] tests individual bundled solutions for elderly people living in different housing and care situations in Tyrol and Vorarlberg.

The vision of the WEST-AAL test region is to help preserve and improve the quality of life of the elderly, while taking into account their social environment and individual needs. For this purpose, products, systems and services based on information and communication technologies are combined, developed and systematically evaluated by active participation of the test households involved. The aim is to assist them to stay independent, safe and comfortable in their familiar environments with the help of a demand-oriented and customisable bundled solution.

Broad Market Analysis and Individual Test Packages

The WEST-AAL bundled solution consists of new technology-based assistive solutions from the AAL sector as well as state-of-the-art technologies. Selected products already available on the market (e.g. house automation) are enriched with AAL-relevant application scenarios and adapted to the requirements of the different test settings. A comprehensive market analysis was carried out at the beginning of the project in order to be able to offer the test households a broad range of test scenarios in a wide range of applications. The solutions collected were evaluated from an organisational, ethical, legal and technological perspective and merged into a product catalogue. In order to ensure usage beyond the pilot phase, each care-giving organisation and the individuals in their care (test households) were given the opportunity to create their own test packages based on organisational/ individual needs.

Sociodemographic Comparison in Evaluation

The individual solutions were tested using six different facilities from the care and social services sector in Tyrol and Vorarlberg. So far, 71 test households have been involved in the project since the start of the test phase. The involvement of test households from different housing and care situations provides insight into local and organisational characteristics and enables sociodemographic as well as structural comparisons. The evaluation methods are diverse and range from standardised questionnaires and data analysis to qualitative methods such as focus groups, experience meetings, individual interviews and anonymous feedback sheets.

The evaluation results obtained so far are very positive from the perspective of the test households. The test subjects characterise the solutions mostly as meaningful, interesting and agreeable. In regular questionnaires to be completed every six weeks, the test subjects can evaluate the impact of the individual applications on seven indicators relating to quality of life (see figure for intermediate results). All test packages used, including 19 different solutions and 42 applications, are assigned and evaluated on the basis of the AAL classification scheme (Taalxonomy).

Wirkung des West-AAL Lösungsbündels auf Indikatoren der Lebensqualität

- Eingesetzte Lösungen klassifiziert nach relevanten Hauptkategorien der AAL TAALXONOMY

*1 = sehr positiv, 2 = eher positiv, 3 = keine Auswirkungen, 4 = eher negativ, 5 = sehr negativ



Evaluation of the effectiveness of bundled solutions in the WEST-AAL project



Test setting in the WEST-AAL project

to use the technologies after the end of the project. Therefore, the aim is to introduce the measures necessary for the deployment of the bundled solutions in regular business operation.

Show Flats in Urban and Rural Areas

In order to make the project more visible, the potential and benefits of the solutions used are made accessible to the general public through demonstrations and empirical reports. The show flats are located in both urban and rural settings and are open to the public (Innsbruck: Residenz Veldidenapark; municipality of Kappl: Seniorenstube).



Project Title

WEST-AAL – AAL Testregion Westösterreich
[AAL Test Region Western Austria]

Programme

benefit

Consortium Manager

University of Innsbruck

Project Coordinator

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Further Project Partners

AIT Austrian Institute of Technology GmbH

FAWO GmbH

GEKKO it-solutions GmbH

Innsbrucker Soziale Dienste GmbH

Senioren Residenzen gemeinnützige Betriebsgesellschaft mbH

Sozial- und Gesundheitssprengel St. Josef Sozialdienste Götzis Gesellschaft m. b. H.

St. Anna-Hilfe für ältere Menschen gemeinnützige GmbH / Liebenau Österreich gemeinnützige GmbH

UMIT – Private Universität für Gesundheitswissenschaften, Medizinische Informatik und Technik Gesellschaft mbH

Vorarlberg University of Applied Sciences

Wohn- und Pflegeheime der Stadtgemeinde Hall in Tirol

Project Duration

2014–2017

Project Website

www.west-aal.at

Taalxonomy

T03 Safety & Security (main category)

T02 Living & Buildings (main category)

T07 Leisure & Culture (main category)

T08 Information & Communication (main category)

T01 Health & Care (main category)

T06 Vitality & Abilities (further category)

T04 Mobility & Transport (further category)

Positive Impact on Safety and Comfort

The results from the surveys show that the applications concerning safety and protection as well as living and building have a very positive influence on people's feeling of safety. According to the test subjects, applications concerning leisure and culture and information and communication increase social interaction. The two indicators mobility and comfort, in particular, are influenced positively by living and building solutions. The solutions concerning health and care have apparently led to a growing positive influence on the indicator comfort over the course of time. According to the test subjects, no solution category had a negative impact on the quality of life indicators assessed. As part of the qualitative surveys, the various end user groups also expressed their willingness to continue

Austria's First Test Region

The moduLAar project is Austria's first test region and demonstrates the positive effect of AAL technology on the quality of life of elderly people. Tests were carried out in fifty flats in Burgenland.



Tablet with moduLAar app

The moduLAar research project was Austria's first co-funded test region. This demonstration project aimed at measuring the impact of AAL technology on the quality of life of older adults and at enhancing the public perception of AAL in general, as well as among policy makers and different stakeholders. This goal was achieved through a large number of publications, talks and presence in various media.

The project involved equipping fifty flats (including several new buildings) with AAL technologies relating to safety, social inclusion, health and comfort. The majority of the flats were connected to a care facility and provided care services

on demand from the Samariterbund in the Burgenland region. Eleven flats provided care services without a nearby care facility and fourteen flats were private properties.

A Comprehensive System with an App as Key User Interface

Technologically the system consisted of a tablet computer, a mini PC for continuous activity tracking in the living environment, an NFC-enabled blood pressure monitor, NFC-enabled weighing scales, an NFC-enabled mobile phone and a mobile emergency call system with GPS and sensors. Additionally, a cloud server was provided for formal and informal caregivers, e.g. to share photos. The app,

provided on Android tablets, formed the central user interface and thus the core component of the overall system for the end user. The average age of the participants was 71 years with a female ratio of 65 percent. The educational level was in general low (74 percent primary school, lower secondary school or apprenticeship; 20 percent upper secondary school; 2.5 percent university), and the participants had a low affinity to technology. 76 percent of the test subjects lived alone.

To measure the impact on quality of life, a number of quantitative and qualitative instruments (mainly standardised questionnaires) were used and adapted to satisfy the special needs of the target group. Additionally, affinity to technology as well as the user experience were evaluated. Information events held at the start of the project at every trial site served to recruit participants and present the AAL technology used. Following collection of baseline data and installation of the technology, the participants were visited at regular intervals to collect additional data, and also to clarify and resolve any technical or usability issues.

From Qualitative Evaluation to Political and Legal Frameworks

A final discussion in focus groups completed the qualitative evaluation in terms of the impact of AAL on quality of life and health as well as the usability of the system. Another aspect of the evaluation was focused on the existing infrastructure on-site and its suitability for older adults. The investigation also explored the existence and usage of political provisions designed to improve the situation of the elderly and support their access to assisting technologies. Professional recommendations, federal and regional policies as well as the relevant legal framework for establishing and financing innovative ICT-based forms of dwelling for specific groups of people in need of care are, in principle, ready for implementation. However, municipalities, organisations or regional authorities so far only rarely use the opportunities provided by the care fund for developing and co-funding innovative forms of dwelling.

Positive Effect of AAL Technology

The data clearly showed the positive effect of AAL technology on quality of life in an age group where maintaining the quality of life can already be seen as a success. Assistive technologies had a verifiable positive impact by satisfying the need for safety and supporting self-assessment of the participants' health status through regular measurement and visualisation of vital parameters (weight, blood pressure, blood sugar). Participation in the project also led to an increase in social interaction in general and provided a welcome change to daily routines.

The project involved the development of a multi-stage exploitation strategy to enable a low-cost entry into the use of AAL technology for end users by initially promoting lifestyle and health aspects. The modular architecture of the system allows easy extension in line with changing user needs later on. AIT Austrian Institute of Technology has already taken concrete steps towards commercial exploitation in cooperation with business partners based on experience from moduLAAR and other projects.



Project Title

moduLAAR – Ein modulares skalierbares AAL System als Lifestyle Element für Silver-Ager bis zu betreutem Wohnen [A Modular Scalable AAL System as a Lifestyle Element for Silver Agers and for Assisted Living]

Programme

benefit

Consortium Manager

AIT Austrian Institute of Technology GmbH

Project Coordinator

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Further Project Partners

Samariterbund Burgenland
University of Applied Sciences Technikum Wien

Project Duration

2012–2015

Project Website

www.modulaar.at

Taalxonomy

T01 Health & Care (main category)
T02 Living & Buildings (further category)
T03 Safety & Security (further category)
T07 Leisure & Culture (further category)
T08 Information & Communication (further category)



Training test users

Local Supply in Rural Areas

Local provision of convenience goods in rural areas is a challenge, especially for elderly and less mobile people. The collaboratively developed ICT platform GreisslerPLUS offers solutions.

Easy access to convenience goods is a basic necessity for all people. Especially in rural areas, this is becoming increasingly difficult, in particular for the elderly and those with reduced mobility. For the elderly and those with reduced mobility, this development jeopardises sufficient provision. In addition to provision of convenience goods, the social and community function of local providers is lost, and meeting points and opportunities for exchange and support are no longer accessible to these particularly vulnerable populations.

ICT Platform in the Pilot Region Schneebergland

The aim of the GreisslerPLUS project is to meet this challenge with an ICT platform for local provision in the pilot region of Schneebergland in Lower Austria. It is designed to link together local suppliers, local producers and consumers taking account of their local and regional needs and specific circumstances. The key feature of this project is cooperative development, integrating both the project consortium and consumers, local providers and other players.

Addressing Different Needs

The future users of the ICT platform are involved in the project right from the start and can directly influence its development. The aim is to reach a diverse group of users from different areas of use (consumers, local suppliers, producers, businesspeople, etc.) and to tailor the platform to their special needs. The requirements for the proposed exchange and supply platform are explored within cooperative workshops specially designed for the different target groups.

The results are then summarised into a set of criteria for further programming and development.

The project includes a test phase, in which the ICT platform is further developed and eventually implemented. This test phase is carried out with comprehensive facilitation by the project team in order to support users in the application, and in some cases, help users to develop the skills needed to use the platform. The project also involves examining the economic aspects of the project and evaluating possible operating and financing models. The final goal of the pilot research project is to transfer the entire structure to an operator who will launch and further develop the platform and implement it on the market.



Project Title

GreisslerPLUS_Schneebergland

Programme

benefit

Consortium Manager

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Further Project Partners

LEADER-Region NÖ Süd

OPESTRA e. U.

University of Applied Sciences Technikum Wien

Project Duration

2017–2018

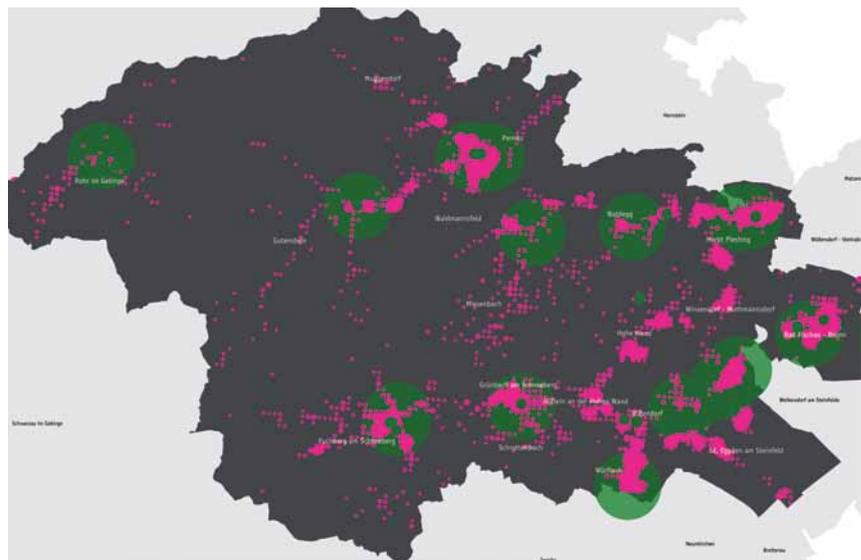
Project Website

www.greissler.plus

Taalxonomy

T04-02 Transport and Supply of Goods (main category)

T06-03 Social Skills (further category)



Supply of convenience goods in the Schneebergland region, Lower Austria

A Smart Way to Address Dehydration

The Drink Smart project develops an intelligent drinking system to prevent dehydration. Drink Smart allows elderly people to continue to live at home and supports caregivers.



Components of the intelligent drinking system Drink Smart

Ensuring an adequate supply of fluids to the body is a major challenge for the elderly, informal caregivers and mobile nurses. As age increases, both the body's water content and the sense of thirst decrease. This makes elderly people particularly vulnerable to dehydration. This can lead to confusion, apathy and life-threatening circulatory collapse with unconsciousness or renal failure and can require acute hospitalisation.

An Intelligent Drinking System

The main focus of the Drink Smart project is to support the independence of elderly people with and without chronic diseases, so that they can remain in their familiar home environment. To achieve this, an intelligent drinking system was developed. A sensor system installed in the drinking vessel measures daily fluid consumption, which can be controlled by a serious gaming concept in a motivational way. The data produced can be recorded and documented via an existing electronic care documentation system. Caregivers can thus be promptly informed and can react immediately in acute cases.

From Data Collection to User Profiles

In the first phase of the project, eleven individual structured interviews, a guideline-oriented focus group of seven participants, as well as six cultural probes were conducted using social scientific methods involving 24 primary end users. In addition, 42 secondary end users were interviewed using the same survey methods, including ten individual structured interviews with relatives, seventeen individual interviews with nurses, a focus group of five nurses and another focus group of ten people. The user profile was created from the extensive data material with the help of compression concepts.

During validation in the home care setting, the prototypes are evaluated with approximately twenty users. The development of the product follows the user-centred design approach combined with current methods of product development. A marketable prototype (hardware and server/application software) for a smart drinking system will be available at the end of the project.



Project Title

Drink Smart – Entwicklung eines intelligenten Trinksystems zur Prävention von Dehydration im Alter [Development of an Intelligent Drinking System to Prevent Dehydration in Old Age]

Programme

benefit

Consortium Manager

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Project Coordinator

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Further Project Partners

akquinet ristec GmbH

MIK-OG

Schorm Gesellschaft m. b. H.

Project Duration

2016–2018

Project Website

www.fh-campuswien.ac.at/lehre/hochschullehre/projekte/detail/drink-smart.html

Taalxonomy

T01-01-01 Risk and Disease Prevention

(main category)

T01-09 Care (further category)

Fighting Loneliness with TV and Tablet

The BRELOMATE 2 project develops a gaming and communication platform for elderly people into a marketable product. Games and video telephony can be used via TV or tablet.

While ICT has a huge impact on everyday communication and social participation, elderly people struggle to overcome technical barriers such as complex interaction with devices and services. Research studies show that life events like transitioning from working life to retirement, the loss of a life partner and sudden changes in living arrangements potentially increase the risk of social isolation among elderly people. In Austria about ten percent of people aged 60 to 69 years and seventeen percent of people aged 80+ are affected by social isolation.

Easy Set-up via the Set-Top Box

With BRELOMATE your own TV becomes the centre of gaming and online communication. The inexpensive home set-up consists of just three devices: a TV plus set-top box, an Internet router and a tablet. The BRELOMATE second screen tablet app is a control unit that interacts with a set-top box for game visualisation and live communication. The tablet acts as the control unit for video telephony, card games and other planned online services. The TV monitor is an ideal size for displaying information and reducing interaction complexity.

Steep Learning Curve amongst Test Users

The project partners St. Pölten University of Applied Sciences and Internet service provider kabelplus involved groups of elderly users from design to development. The first services developed included video communication and the popular Austrian turn-based card game Schnapsen. Initial tests showed that elderly users aged 61 to 81 quickly engaged in gaming. The ten test subjects were first-time tablet users and they were playfully introduced to learning the second screen



Participants playing the BRELOMATE card game.

interaction concept. As confidence and technical acceptance rose during the thirty-minute sessions, the course of the game became more fluent and video communication was used more often.

In 2017 over forty elderly households in the St. Pölten area will participate in a large field study for a six-month period accompanied by social scientists. The high quality of interaction design and easy-to-use hardware and software allows seniors to engage and participate in extended online experiences. BRELOMATE aims to become a marketable online gaming and communication platform, offering online services for the elderly to foster a long, independent and self-organised life at home.



Project Title

BRELOMATE 2 – Breaking Loneliness with Mobile Interaction and Communication Technologies for Elderly 2

Programme

benefit

Consortium Manager

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Project Coordinator

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Further Project Partner

kabelplus GmbH

Project Duration

2015–2017

Project Website

<http://brelomate.fhstp.ac.at>

Taalxonomy

T08-03 Communication (main category)

T08-03-02 Video Communication

(further category)

T07-06-04 Further Games (further category)

Easy Access to the National Park

The senTOUR project offers a tourist service adapted to the needs of elderly people. They can explore the Gesäuse National Park using a web-based information portal and a mobile app.

The elderly are an important target group for tourism and recreation. The elderly are confronted with age-related deficits as regards vision/sight, mobility and orientation and thus require services that respect and meet their needs. The aim of the project is to provide elderly people with specially designed on-site tourism information via a senior-friendly web-based information portal for the Gesäuse National Park. The main component is an interactive map that is processed in an accessible and senior-friendly way and can be accessed via a mobile application.

National Park Maps with Semantic Text-to-Speech Output

Information which is needed for a visit to the National Park and on-site orientation is made accessible by providing information addressing at least two senses simultaneously. Therefore, emphasis was placed on a senior-friendly layout of the graphic user interface and map (larger font, large symbols, etc.) as well as

supporting non-visual access to information. The contents of the information portal can also be heard via the innovative semantic text-to-speech output of the National Park map ("talking map").

Indoor and Outdoor Navigation

The combination of web portal (desktop version) and app for mobile devices allows for universal operation of senTOUR from trip planning at home to on-site navigation. During navigation users have many possible ways to have their surroundings described and can make use of senior-friendly functions like tour selection according to preassigned criteria of personal impairment, search for the nearest resting place or help/emergency call.

The end users were involved not only in testing the desktop version (some twenty test subjects), but also directly on site (around fifteen test subjects). In this way, the project team was able to assess

the disabilities of potential end users more accurately and use the results for app design. The project resulted in many new findings regarding senior-friendly, accessible map design. The main focus is easy, intuitive usability, and information output has to be designed in a way that it can be easily understood by people with different kinds of impairment.



Project Title

senTOUR – Seniorengerechte inklusive Toureninformation im Tourismusbereich [Inclusive Tour Information Adapted to the Needs of Elderly People in the Tourism Sector]

Programme

benefit

Consortium Manager

AccessibleMap Association

Project Coordinator

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Further Project Partners

CEIT Research Network
Nationalpark Gesäuse GmbH
ÖAR

Paris Lodron University of Salzburg
Positec Technologie Entwicklungs GmbH

Project Duration

2014–2016

Project Website

www.sentour.at (no longer accessible)

Taalxonomy

T04-03-03 Navigation (main category)

T07-01 Sports and Fitness (further category)



End users testing the Lettmair Au thematic tour.

Methods for the Development of Business Models for AAL Solutions

The AAL-METHODS study explored methods for the development of business models for AAL solutions, focusing on the involvement of end users as a crucial factor.

Problem Definition

A critical success factor for the development of new AAL products and services and their acceptance in the market is to involve the relevant stakeholder communities in the early stages of product or service development. This not only concerns usability aspects, but also the development of an effective business model for managing the difficult step from an R&D project to market entry.

Objective of the Project

The main objective of the study was to offer an overview of different methods relevant to the development of business models for AAL solutions. The methods selected according to stakeholder involvement were evaluated for their suitability for various purposes, described systematically and prepared for the German-speaking AAL community. The study offers an overview of hands-on tips and assistance for current and future AAL projects and provides suggestions and recommendations on how efficient involvement and intensive networking of all stakeholders can support the development of a sustainable business and operator model. The study ultimately aims to enable a successful market launch of new services so that AAL solutions are available on the market within one to three years of the end of the project.



AAL-METHODS study: methods for the development of business models

Outcomes and Results

- Toolbox of methods. The toolbox provides a varied range of different methods and techniques which are suitable for the development of potential business models for AAL products and services. The collection of methods and techniques is systematically assigned to six ideal-typical stages of business model development according to Daniel Schallmo (*Geschäftsmodell-Innovation* [Business Model Innovation], 2013). Depending on the use and benefit, different stakeholders can get involved actively or passively. Website: <http://methodenpool.salzburgresearch.at/methodensammlung/aal/> (in German)
- Results of the study: https://methodenpool.salzburgresearch.at/wp-content/uploads/AAL-Methoden_Studienreport.pdf (in German)
- Recommended literature on the subject of business models in the field of AAL: https://methodenpool.salzburgresearch.at/wp-content/uploads/AAL_Literatur.pdf (in German)



Project Title

AAL-METHODS – Einbeziehung von End-AnwenderInnen als Erfolgsparameter in der marktnahen AAL-Produkt- und Dienstleistungsentwicklung [Involvement of End Users as a Crucial Factor in the Market-Oriented Development of AAL Products and Services]

Programme

benefit

Contractor

Salzburg Research
Forschungsgesellschaft m. b. H.

Project Coordinator

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Project Duration

2014–2015

Project Website

www.salzburgresearch.at/projekt/aal-methods/

A Practical Taxonomy for Effective Classification of AAL Solutions

The TAALXONOMY project created a comprehensive and viable taxonomy for classifying AAL products and services.

Problem Definition

A range of innovative ICT-based technologies and services that support independence and autonomy and improve the quality of life of older adults has been developed in the context of AAL over the past few years. However, a structured classification and comparison of these products and services has proven difficult due to the lack of or insufficient classification models.

Objective of the Project

The TAALXONOMY project thus developed a taxonomy for effective classification. Relevant aspects, categories and indicators were deduced and transferred into a practical taxonomy in accordance with international definitions, initiatives, norms and standards. Involving relevant consumers, users and experts, a practical taxonomy for effective classification of AAL products and services was developed and complemented with recommendations for further standardised procedures and effective exploitation measures.

Outcomes and Results

Since AAL is a dynamic field, TAALXONOMY is designed in a way that allows solutions to be classified in different stages of development. The system is thus suitable for classifying solutions which are already available on the market, while also being open for new innovative solutions.

In order to represent a solution in the best possible way, AAL solutions are classified according to areas of application and use cases. Furthermore, aspects of quality of life are assigned to the areas of application, which allows appropriate AAL solutions to be derived from quality of life factors.

TAALXONOMY was validated through iterative feedback, intense workshops and face-to-face interviews of experts, solution providers and users, whose feedback was used for further optimisation of the taxonomy. TAALXONOMY thus offers a thorough and practical categorisation system for AAL solutions with considerable potential for exploitation. It addresses solution providers, users and research actors and opens up possibilities for a wide range of applications.



Project Title

TAALXONOMY – Entwicklung einer praktischen Taxonomie zur effektiven Klassifizierung von AAL-Produkten und -Dienstleistungen [Development of a Viable Taxonomy for Classifying AAL Products and Services]

Programme

benefit

Contractor

SYNYO GmbH (principal point of contact)

Project Coordinator

Dr Peter Leitner

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Further Project Partners

EURAC Research

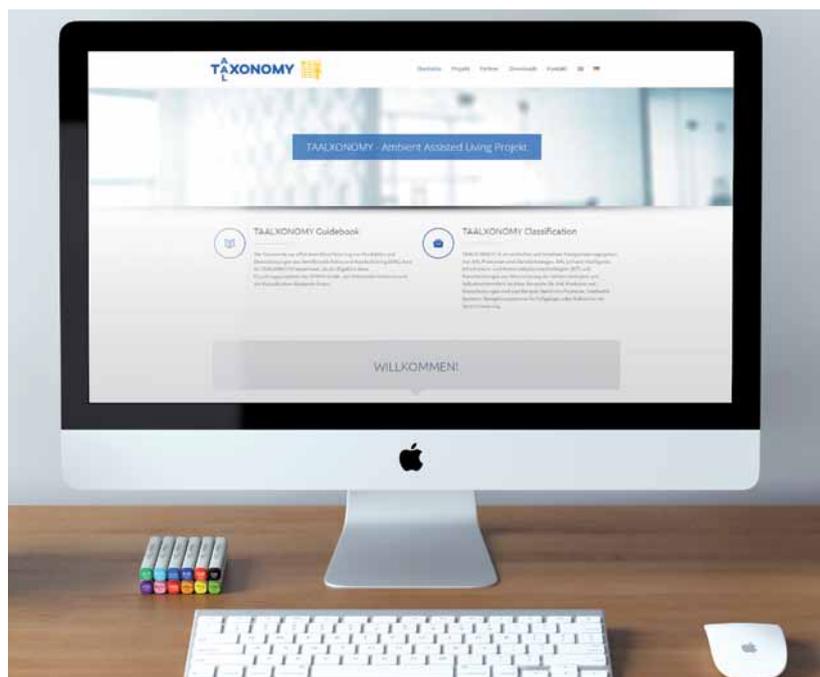
University of Innsbruck

Project Duration

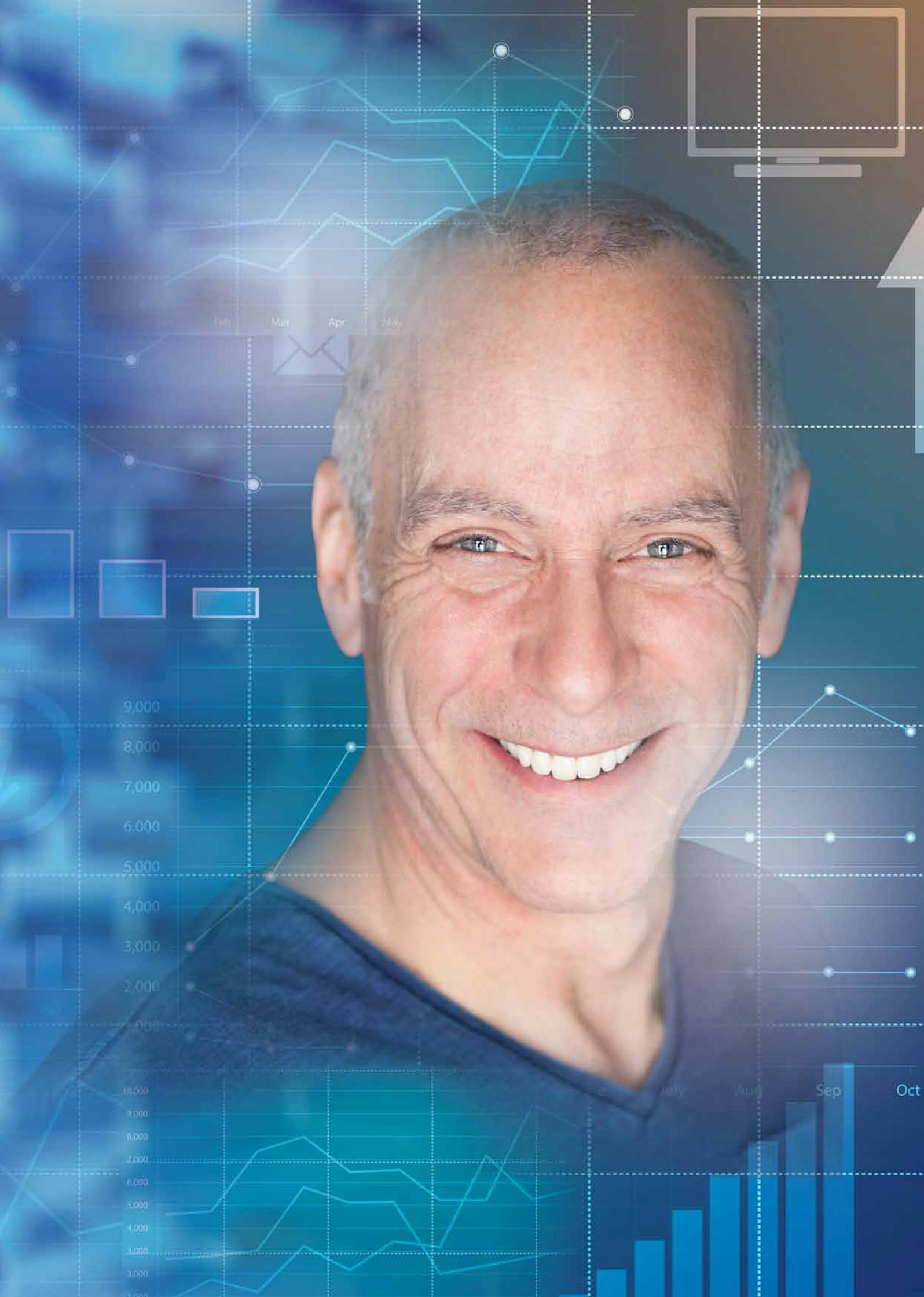
2014–2015

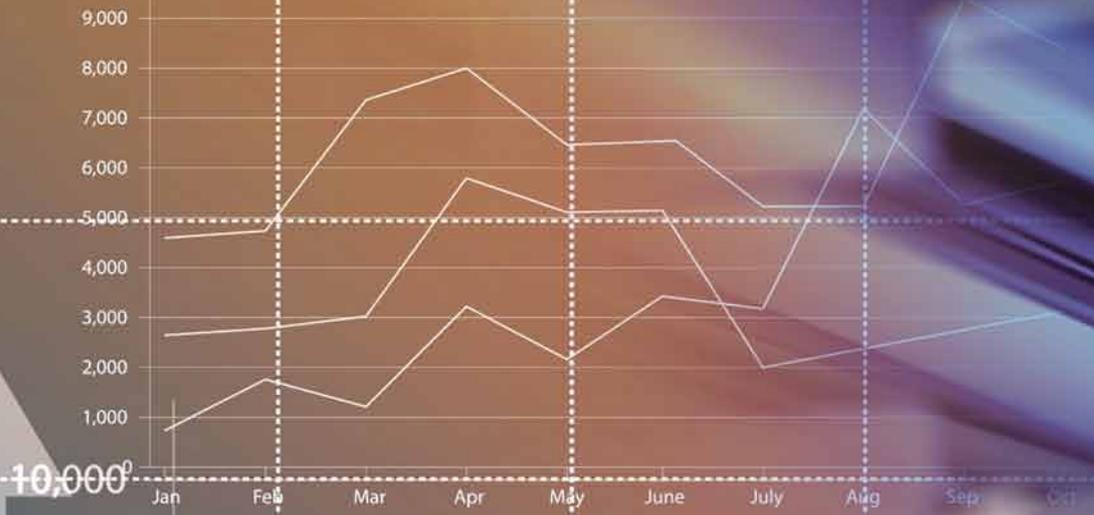
Project Website

www.taalxonomy.eu



TAALXONOMY addresses solution providers, users and actors from the R&D sector.





AAL



Decision Support for Independent Living

The European AAL project ActiveAdvice develops an advice and decision support network across Europe using an intelligent AAL Product & Service Cloud.

The ActiveAdvice project aims to improve public awareness, knowledge and understanding of AAL products and services and to increase the uptake of these products and services. Thus, it addresses and brings together information and support for three target groups:

- consumers, i.e. older adults and their relatives;
- businesses, i.e. companies and organisations which supply innovative products and services but have difficulty in reaching specific users;
- and government and public sector organisations delivering services for older adults.

Recommendations of Products for Independent Living

ActiveAdvice will offer a new service to bring together people from these different target groups, and help them make the right decisions about assisted living products and services. For example, a daughter looking for a telecare service for her elderly mother will be able to see services available from both commercial operators and public authorities, and look at reviews from other users of the service.

The ActiveAdvice project aims to create an advice and decision support network across Europe by

- providing a broad and intuitive overview of AAL suppliers, services and technologies, offered at regional, national and international level, and
- supporting informed decision-making. This information will be accessible via apps, websites and portals.

Quality Management through Feedback, Testing and Accreditation

Each target group's own specific needs, such as supporting people to be happier and more comfortable in their own homes, are met by tailoring three service models. These needs are identified by consulting stakeholders in each of the target groups, e.g. by conducting interviews. Iterative user feedback, usability testing and accreditation for human advisors across all consortium countries ensure the quality of the ActiveAdvice environment.

Additionally, this will be combined with a network of Authorised Active Advisors holding a certificate to show their network membership and professional user access to the intelligent AAL Product & Service Cloud. Active Advisors will be drawn from various business sectors related to AAL.



Project Title

ActiveAdvice – Decision Support Solutions for Independent Living Using an Intelligent AAL Product and Service Cloud

Programme

Active and Assisted Living Programme

Consortium Manager

SYNYO GmbH

Project Coordinator

Dr Peter Leitner
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Further Project Partners

City of Alkmaar
Cybermoor Ltd
Smart Homes
University of Porto, CINTESIS – Center for Health Technology and Services Research
Yellow Window NV
ZHAW Zurich University of Applied Sciences

Participating Countries

Austria, Belgium, the Netherlands, Portugal, Switzerland, United Kingdom

Project Duration

2016–2018

Project Website

<http://project.activeadvice.eu>

Taalxonomy

T08-01 Information and Knowledge
(main category)

T08-02 Consulting, Coaching and Assistance
(further category)



ActiveAdvice develops a European network which offers recommendations for AAL products and services.

Intelligent Guidance in Everyday Life

The European AAL project DayGuide develops a social platform which facilitates everyday life for people with cognitive impairments. The platform is tested in a clinical study.

DayGuide assists adults with special needs in various domains necessary for independent living at home, stimulating patient empowerment and active participation in society. DayGuide is a unique combination of human interaction and networking on the basis of a social platform with intelligent interpretation of indoor localisation data. The automatic interpretation of these data combined with professional care know-how on a closed social platform represents a completely new assistive solution for informal care networks.

Support for People with Cognitive Impairments

The DayGuide technology provides three major functions to support people diagnosed with related cognitive impairments:

- novel, location-specific reminders and guidance;
- a web-based social platform for communication and organisation of tasks;
- an easy access tool for the home, where access is granted via a standard smartphone.

DayGuide introduces a novel ICT-based system designed to support older adults suffering from mild cognitive impairment and early dementia and their families in their daily life. These persons experience domestic challenges, which prevent them from pursuing an independent, self-organised life at home. DayGuide responds directly to these challenges through technology allowing people to live longer in an independent way.

Informal caregivers benefit through improved information and exchange in a networked environment. The DayGuide service will be tested by care organisations in clinical studies with sixty end users in Austria, the Netherlands and Switzerland.

Expected Results and Impact

DayGuide will improve the quality of life of end users in two ways. First, it structures daily activities for the elderly in early phases of mild cognitive impairment or dementia and provides significant relief, as DayGuide is tailored to the specific needs of each individual. Secondly, this also affects the quality of life of the carer. Preventing the burden and stress on the caregiver significantly reduces the need for pharmacological treatment of this group and prevents secondary diseases.



Project Title

DayGuide – Guiding Persons with Cognitive Challenges in Daily Living

Programme

Active and Assisted Living Programme

Consortium Manager

AIT Austrian Institute of Technology GmbH

Project Coordinator

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Further Project Partners

Cubigo International NV

CREAGY AG

De Wever

Kadex B.V.

Kepler Universitätsklinikum GmbH

MAS Alzheimerhilfe

Movisie

terzStiftung

Participating Countries

Austria, Belgium, the Netherlands, Switzerland

Project Duration

2016–2019

Project Website

www.dayguide.eu

Taalxonomy

T08-01 Information and Knowledge (main category)

T08-02 Consulting, Coaching and Assistance (further category)

T08-03 Communication (further category)



DayGuide combines an intelligent social platform with professional care expertise.

An Automatic Toilet to Support Active Living

The European AAL project iToilet develops a computer-based toilet system which allows independent living with more dignity and reduces care requirements.

The iToilet research and development project supports older persons living independently at home through an ICT-enhanced toilet system. This empowers older persons to live more independently and with increased dignity and reduces the workload of care persons when providing personal assistance with daily hygiene.

Background and Motivation

Despite rapid technological developments, surprisingly, there is one very common appliance we use several times a day which has not changed much since its invention: the toilet. The iToilet project addresses the needs of older or physically challenged persons by designing a supportive toilet adapting to the individual user's needs.

The solution is based on a height- and tilt-adjustable toilet seat placed on top of a standard toilet bowl. Additional features include, for instance, voice control, automatic adaptation to user preferences, recognition of potentially dangerous

situations (e.g. falls), as well as an interface to care documentation or guidance for use. The iToilet system increases primary end users' independence by enhancing body stability when sitting on the toilet (individually adjustable optimum height, hands are free for handles), by dynamically adapting tilt and height to support the sitting down and standing up process and by increasing safety via emergency detection.



User-Centred Approach

The iToilet project follows a strictly user-centred transdisciplinary approach with continuous ethical supervision. End users are involved right from the beginning in eliciting user requirements and in participatory design activities.

The iToilet project evaluates prototypes together with end users in a laboratory. The final prototype will be tested at two institutions over a period of four months, each involving at least twenty-five end users and five to seven caregivers.



Room with iToilet



Project Title

iToilet – ICT-Enhanced Toilet Supporting Active Life

Programme

Active and Assisted Living Programme

Consortium Manager

Vienna University of Technology

Project Coordinator

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Further Project Partners

CareCenter Software GmbH
CS Caritas Socialis GmbH
Országos Orvosi Rehabilitációs Intézet
Santis Kft.

Smart Com d. o. o.

Synthema Srl

Participating Countries

Austria, Hungary, Italy, Slovenia

Project Duration

2016–2018

Project Website

<http://itoilet-project.eu>

Taalxonomy

T01-06 Personal Hygiene (main category)

T01-09-01 Care Services (further category)

T01-09-03 Care Documentation

(further category)

T02-04-03 Sanitary Services (further category)

T03-05-03 Automatic Alarm (further category)

Health at Work 4.0

The European AAL project wellbeing tackles the issue of health in the workplace: the online platform gives feedback on unhealthy behaviour and provides nutrition advice and stress management.



Relaxing at work with the wellbeing system

Most jobs require older adults (aged 50+) to spend more than eight hours a day in a seated position. When combined with non-ergonomic workplaces and limited exercise, severe health problems can arise. Furthermore, cognitive capabilities decrease with age, whereas the stress level increases. This leads to a reduced quality of life in older adults due to physical (e.g. back) and psychological (e.g. stress) problems.

Recognising the Needs of Elderly People

The wellbeing system offers a holistic online platform, combining physical exercises, workplace ergonomics, nutritional balance and stress management in order to ensure a healthy work environment, especially focusing on the needs of older employees. Since older adults work in very diverse areas, the project focuses on the main feature they all have in common: the extensive target group of employees who perform their job in a seated position for a prolonged period of time. Hence, the project is aimed at a broad spectrum of different jobs and target groups, including, for instance,

secretaries, office clerks, technicians, lawyers, etc.

Online Platform with 3-D Sensor and Camera

All the modules of the wellbeing platform use a 3-D sensor together with an RGB camera to provide feedback on posture and unhealthy situations (e.g. seated position, poor nutrition, inadequate water intake, etc.). The motivation to use the platform is increased by combining the exercises in the system with games (so-called exergames) to support a social fun and competitive element, even among colleagues. The ultimate goal of wellbeing is to induce a long-term behavioural change by continuously giving feedback to the end user thus guiding them towards a healthier working style.

Feedback through Interviews and Long-Term Testing

End users are involved throughout the project via telephone interviews, questionnaires and focus groups (approximately 2,000 older adults at their

workplace) as well as a twelve-month trial period in order to obtain long-term data (more than 55 older adults). New findings from the user pilots are continuously integrated into system development in order to facilitate market readiness at the end of the project.

Health in the workplace has developed into a widely recognised issue in recent years. This is also illustrated by the fact that a wide range of potential end users from the banking and insurance sector are actively testing the wellbeing system and provide valuable feedback for the product launch.



Project Title

wellbeing – Optimizing the Workplace of ELderly Laborers: BE IN Good health!

Programme

Ambient Assisted Living Joint Programme
Consortium Manager

CogVis Software und Consulting GmbH

Project Coordinator

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Further Project Partners

AIMC Advanced Information Management Consulting GmbH

Fitbase Institut für Online Prävention GmbH

Ingeniería y Soluciones Informáticas S. L.

Intrarom S. A.

Smart Homes

University of Vienna

Vienna University of Technology

Participating Countries

Austria, Germany, the Netherlands,

Romania, Spain

Project Duration

2014–2017

Project Website

www.wellbeing-project.eu

Taalxonomy

T01-01 Health Care and Prevention
(main category)

T08-02 Consulting, Coaching and Assistance
(further category)

Increased Wellbeing through Innovative Interaction

The European AAL project RelaxedCare developed a solution which not only increases the wellbeing of elderly people, but also reduces the burden and stress on relatives.

"Is my mum doing okay right now?" This question is ever-present in the mind of informal caregivers. Feelings of burden, stress and, in some cases, even burn-out are common results of their manifold tasks. For reassurance of the assisted person's wellbeing, regular phone calls or visits are the current solution, causing even more stress. Most assisted persons do not want to put more burden on their informal caregiver or disturb them in their busy daily life and often perceive their own problems as minor.

A Lifestyle Product Which Fosters Wellbeing and Communication

With this in mind, RelaxedCare has identified three goals:

- (1) To answer the question "Is my mum doing okay" in an easily comprehensible and unobtrusive way by providing wellbeing information.
- (2) To provide an easy way to stay connected with loved ones, with low communication barriers.
- (3) To combine these functions in an aesthetically designed lifestyle product that is fun to use, increasing the bonds within families.

The RelaxedCare project aimed to create an entirely new way of communicating and caring: allowing more communication from the assisted person's side while

unobtrusively keeping informal caregivers worry-free and informed about the assisted person's state of wellbeing.

Smart Home System with Interactive Cube and App

The RelaxedCare system consists of an aesthetically designed cube and a smartphone app. The cube is connected to a smart home system installed at the assisted person's home. Innovative behaviour pattern recognition methods detect the user's state of wellbeing, including activity level, social interaction and daily life routines.

On the caregiver's side, the state of wellbeing is displayed constantly via a corresponding indicator on the RelaxedCare cube and the app. The cube also enables both sides to send simple messages using an innovative interaction design: placing tiles with specific icons on top of the cube. Asking for help, requesting a call or saying "I am thinking of you" has never been simpler than with RelaxedCare.



The components of the RelaxedCare solution: RelaxedCare cube and smartphone app.



Project Title

RelaxedCare – Unobtrusive Connection in Care Situations

Programme

Ambient Assisted Living Joint Programme

Consortium Manager

AIT Austrian Institute of Technology GmbH

Project Coordinator

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Further Project Partners

Eichenberger-Szenografie
50plus GmbH
Ibernex Ingenieria S. L.
iHomeLab, Lucerne University of Applied Sciences and Arts
mobili

New Design University
soultank AG

Swiss Red Cross Lucerne

Participating Countries

Austria, Slovenia, Spain, Switzerland

Project Duration

2013–2016

Project Website

www.relaxedcare.eu

Taalxonomy

T08 Information & Communication
(main category)

T01 Health & Care (further category)



A test user testing the RelaxedCare system.

Virtual Assistance for More Safety

The European AAL project DALIA developed a platform which offers older persons, informal caregivers and care service providers a modular system including a virtual personal assistant.

DALIA is designed as an integrated support system for older persons. By connecting with informal caregivers and formal care services the independence of older persons is promoted, enhancing the feeling of safety of both the assisted person and the caregivers. DALIA provides modular services for social interaction, reminders (appointments, medication), determining the individual's state of wellbeing and giving motivational advice through a unified user interface.

Virtual Personal Assistant Provides Support

One of the innovations of DALIA is the user-oriented design based on speech recognition and speech output in the form of a virtual personal assistant. This design has been developed in close cooperation with real end users.

Another innovation is the security feature for sensitive data based on the principles of proxy re-encryption for authorised users and "blind cloud computing", which ensures that sensitive data stored in central components is always encrypted.

Finally, the modular architecture of DALIA can be seen as an innovation in itself, since it allows end users to adapt the system to their individual needs and makes it easy to integrate additional modules to broaden the spectrum of support. A user-friendly approval facility allows primary end users to give certain users restricted access to specific features such as related informal or formal carers. DALIA is based on a mobile platform using state-of-the-art technology and works with devices which are already used at the elderly person's home to keep hardware requirements low.



A usability workshop participant testing the DALIA main menu.

End User Participation in Four Countries

Over forty users (older persons and informal caregivers) from four different countries (Austria, Switzerland, Netherlands, Luxembourg) were involved in the development and evaluation of the project results in DALIA by participating in workshops, interviews or field trials.

As a result of this project, the Graz-based company exthex GmbH is currently transitioning the DALIA prototype into a marketable product under the brand name "e-nnovation – smart solutions". The first successful steps have already been made and the concept for "Emma – Flexible Living Assistant" received the eAward in the "Human and Health" category in 2016.



Project Title

DALIA – Assistant for DAily LIfe Activities at Home

Programme

Ambient Assisted Living Joint Programme

Consortium Manager

exthex GmbH

Project Coordinator

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Further Project Partners

Graz University of Technology

iHomeLab, Lucerne University of

Applied Sciences and Arts

Stiftung Hëllef Doheem

't Dijkhuis

terzStiftung

TP Vision Belgium

University of Applied Sciences Upper Austria

Virtask B.V.

Volkshilfe Steiermark GmbH

Participating Countries

Austria, Belgium, Luxembourg,

the Netherlands, Switzerland

Project Duration

2013–2016

Project Website

www.dalia-aal.eu

Taalxonomy

T08 Information & Communication (main category)

T03 Safety & Security (further category)

T06 Vitality & Abilities (further category)

T01 Health & Care (further category)

Mobility Assistance System for People with Dementia

In close collaboration with research and care institutions, the European AAL project CONFIDENCE has developed and tested a mobility assistance service for people with dementia.



The CONFIDENCE app makes everyday life easier for people with cognitive impairments.

The assistance system developed within the CONFIDENCE project combines personal assistance with state-of-the-art technology and helps those living with dementia to remain mobile and active for longer. The solution won two international AAL Awards in 2014. Primary users of the mobility assistance service are older people displaying the first signs of cognitive impairment or incipient dementia, as well as those with mild to moderate dementia. Secondary users are family caregivers, professional carers and volunteers.

All stakeholders were heavily involved in each stage of the project. To ensure that their wishes and requirements could be met, workshops were organised in Austria, Switzerland and Romania. Based on the results of these workshops, the following issues were taken into account when developing the assistance system: support with everyday tasks and in emergencies, disorientation and forgetfulness, social inclusion and reducing the burden on carers.

included a support feature with video or voice call, an emergency feature, a calendar and reminder feature, a navigation feature, as well as a surroundings feature with information on the latest weather conditions and tips for suitable clothing. The CONFIDENCE Community has been established with the aim of reducing the burden on caregivers by integrating all the people involved in the care process, as well as other volunteers, and coordinating the responsibilities and tasks via the CONFIDENCE web portal.

Field Tests with Primary and Secondary End Users

The system was tested under real conditions in two six-week field tests involving approximately 450 primary and secondary end users in Austria, Switzerland and Romania. After using the system, 51 percent of primary users stated that CONFIDENCE had a positive effect on their lives. The most common reasons indicated were a heightened sense of safety, more communication with others and less forgetfulness.

App, Web Portal and Community
Two smartphone applications have been developed – one for primary and one for secondary users – as well as a web portal for managing the “CONFIDENCE Community”, which provides additional support.

Developments

The product is now being prepared for series production. Its main USPs are the combination of ICT and personal support, different service levels, the option to develop and integrate care networks, developed in collaboration with “real” end users. The plan is for CONFIDENCE to be sold by caregiving organisations.



Project Title

CONFIDENCE – Mobility Safeguarding Assistance Service with Community Functionality for People with Dementia

Programme

Ambient Assisted Living Joint Programme

Consortium Manager

Salzburg Research Forschungsgesellschaft m. b. H.

Project Coordinator

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Further Project Partners

Ana Aslan International Foundation of Ageing
Eichenberger-Szenografie

Hilfswerk Salzburg Gemeinnützige GmbH

iHome Lab, Lucerne University of

Applied Sciences and Arts

ilogs mobile software GmbH

Presence Displays B.V.

Raiffeisenlandesbank Kärnten– Rechenzentrum
und Revisionsverband reg. Gen. m. b. H.

Swisscom Participations Ltd

terzStiftung

Participating Countries

Austria, the Netherlands, Romania, Switzerland

Project Duration

2012–2015

Project Website

www.confidence4you.eu

Taalxonomy

T03-01 Damages and Hazards (main category)

T03-03 Falls (further category)

T03-04 Person Localisation (further category)

T03-05 Emergency Management and Alarms
(further category)

T04-03 Travel Information and Navigation
(further category)

T06-02 Cognitive Abilities (further category)

T06-03 Social Skills (further category)

T08-03 Communication (further category)

Innovative AAL User Interfaces

In the European AAL project AALuis applications and user interfaces can be flexibly combined and adapted to the needs of end users.

Older adults are a very heterogeneous group comprising a broad range of different cognitive and motor abilities and limitations. However, technical solutions often do not address this diversity and do not consider changing needs and preferences (i.e. one-size-fits-all approach). This may be one of the reasons many valuable AAL services do not reach enough end users.

AALuis offers a practical solution for flexible self-adaptation of user interfaces to meet the (changing) needs and wishes of older adults. This is also reflected in its innovative services, ranging from comfort to care, and the wide range of devices supported. Moreover, users are free to choose the interaction device (e.g. TV, smartphone) which best suits their specific needs.

Respect Starts with Listening

End users and their needs and wishes were put at the centre of the project from the beginning. The AALuis project team applied very popular user-centred design methods (i.e., personas, cultural probes, video analysis and diaries) for the continuous involvement of end users and associated care organisations.

Several rounds of lab and field trials were executed under real-life conditions. Both end user organisations (50plus GmbH and Hilfswerk Österreich) played an invaluable role in this process. In total, 116 primary end users (44 male, 72 female) were involved.

Unique Value

For the end users, AALuis provides maximal freedom of choice regarding device selection, the look and feel and the use of innovative technologies. This facilitates inclusiveness regarding disabled, vulnerable or at-risk profiles for sensory incapacities.

Service and user interface developers benefit from the separation of concerns, i.e. a strict separation of content and representation. Thus, they can focus on what they do best and develop innovative services or suitable user interfaces. Furthermore, the AALuis solution offers service providers the chance to combine services and user interfaces flexibly, addressing both user needs and market

demands. Thus, AALuis strives to close the gap between great AAL innovations and the end users being part of an ageing population, who may benefit from innovative services and scalable innovations.



Project Title

AALuis – Ambient Assisted Living User Interfaces

Programme

Ambient Assisted Living Joint Programme

Consortium Manager

AIT Austrian Institute of Technology GmbH

Project Coordinator

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Further Project Partners

CURE – Center for Usability
Research & Engineering

50plus GmbH

Hilfswerk Österreich

ProSyst Software GmbH

TP Vision Netherlands B.V.

Verklizan B.V.

weTouch e.U.

zoobe message entertainment GmbH

Participating Countries

Austria, Germany, the Netherlands

Project Duration

2011–2014

Project Website

www.aaluis.eu

Taalxonomy

T08-03 Communication (main category)



Fearless through Everyday Life

The European AAL project FEARLESS developed 3-D visual computing algorithms which automatically detect falls and enable ageing without fear.

The FEARLESS Life Comfort System provides peace of mind for the elderly and their formal and informal caregivers. The novel system was developed by CogVis in cooperation with the Vienna University of Technology's Computer Vision Lab and other project partners. Unlike existing products, it is able to detect falls fully automatically, triggers alarms and thus enables rapid response. Falls are the leading cause of injuries in older people, with 25 million people affected in the EU and US alone, who may be potential end users of the FEARLESS system.

Analysis of Surroundings and Movement

Setting up the FEARLESS system is intuitive and easy and there is no need for the user to actively interact with a sensor. It monitors the surroundings non-stop, differentiating between objects and people and their movements, without influencing the user's daily routines. This is achieved by the use of 3-D sensors in combination with 3-D computer vision algorithms, based on latest machine learning technologies. This novel solution thus offers a significant advantage over other products that need to be carried, or even operated and serviced, by the user. It does not require the person to

wear any kind of device (e.g. "panic button"). Furthermore, unlike the sensor mat approach, the FEARLESS system is more flexible and not limited to a certain area.

Reaction to Unusual Behaviour

The FEARLESS system is able to detect falls and can give early indication to caregivers or medical personnel. It also recognises unusual changes in behaviour: information on behaviour changes such as restlessness during the night or decreased mobility can provide valuable information for relatives, caregivers or medical personnel and enable them to react immediately.

The FEARLESS system has already been installed in a number of nursing homes in Austria and abroad. It has successfully detected falls during multiple incidents and significantly reduced the reaction time of first responders. Besides providing a feeling of safety to seniors and their caregivers and loved ones, FEARLESS also supports an active and unburdened lifestyle and even leads to a less disturbed night's rest.

Current Developments

The CogVis team is already working on a new version of FEARLESS. In the future, this technology will be available for mobile use in autonomous robots. Over the past three years CogVis has collaborated with Toyota, the first customer to use the FEARLESS system on their Human Support Robot.



FEARLESS allows fall detection.



Project Title

FEARLESS – Fear Elimination As Resolution for Loosing Elderly's Substantial Sorrows Programme

Ambient Assisted Living Joint Programme Consortium Manager

CogVis Software und Consulting GmbH

Project Coordinator

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Further Project Partners

Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.

Fundació i2CAT, Internet i Innovació Digital a Catalunya

Infokom GmbH

Linkcare Health Services S. L.

Medical University of Vienna

Samariterbund Wien

TeSAN S. p. A.

University of Bamberg

Vienna University of Technology

Participating Countries

Austria, Germany, Italy, Spain

Project Duration

2011–2014

Project Website

www.fearless-project.eu

Taalxonomy

T03-03 Falls (main category)

T03-05 Emergency Management and Alarms (further category)



Feeling safe in everyday life with FEARLESS.

Easing the Burden of Professional Caregivers

The European AAL project 2PCS developed an integrated service and emergency call system which provides support in the care of elderly people.

The 2PCS project developed an alerting and locating system designed for professional caregivers for indoor and outdoor use, addressing the safety and independence of persons in care. The system was tested in three different pilot sites in Austria, Italy and Switzerland including call centre services. The main objectives of the project were to increase personal mobility, facilitate access to services and communication support and enhance the subjective and objective feeling of safety of older adults and their social environment.



The development process for 2PCS was based on the Design Science Research (DSR) approach, with a focus on identifying and evaluating market conditions and on permanent user integration (more than 2,000 persons) to ensure a user-centred design before developing the 2PCS artefact.

The feedback from users of the iterative pilots carried out under realistic conditions in existing care environments was very valuable for further development during the

project and subsequent market launch (series production).

Serial Production for Care Institutions
2PCS Solutions GmbH was founded two years after the end of the project and holds all relevant IPR. Every single component of the 2PCS system was modified, updated and newly developed to ensure scalability and to support rapid commercialisation. This includes in particular wearing styles, design adjustments, optimised usability and interoperability with third-party systems. Serial production started in December 2016 and the system was first implemented in professional care settings.

Watch, Infrastructure and Management Software

Systematic research and experimental development led to a system consisting of the 2PCS safety watch, the 2PCS infrastructure and the 2PCS web-based management software for flexible process control. At the end of the project, the 2PCS system showed the potential to be ready for serial production and market launch in the subsequent two to three years. The process and technology mix of 2PCS provides a unique solution with specific safety and comfort functionalities for diverse market segments taking into account ethical requirements and multinational legal frameworks.



Project Title

2PCS – Personal Protection and Caring System
Programme

Ambient Assisted Living Joint Programme

Consortium Manager

University of Innsbruck

Project Coordinator

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Further Project Partners

Curena AG

EURAC Research

Humanocare GmbH

Mieloo & Alexander B.V.

Odenwälder Kunststoffwerke Gehäusesysteme GmbH

Privatklinik Villa Melitta – Casa Di Cura

RF-Embedded GmbH

TERTIANUM-Stiftung

Participating Countries

Austria, Germany, Italy,

the Netherlands, Switzerland

Project Duration

2011–2013

Project Websites

www.2pcs.eu

www.2pcs-solutions.com

Taalxonomy

T01-09 Care (main category)

T02-06 Entrance Control (further category)

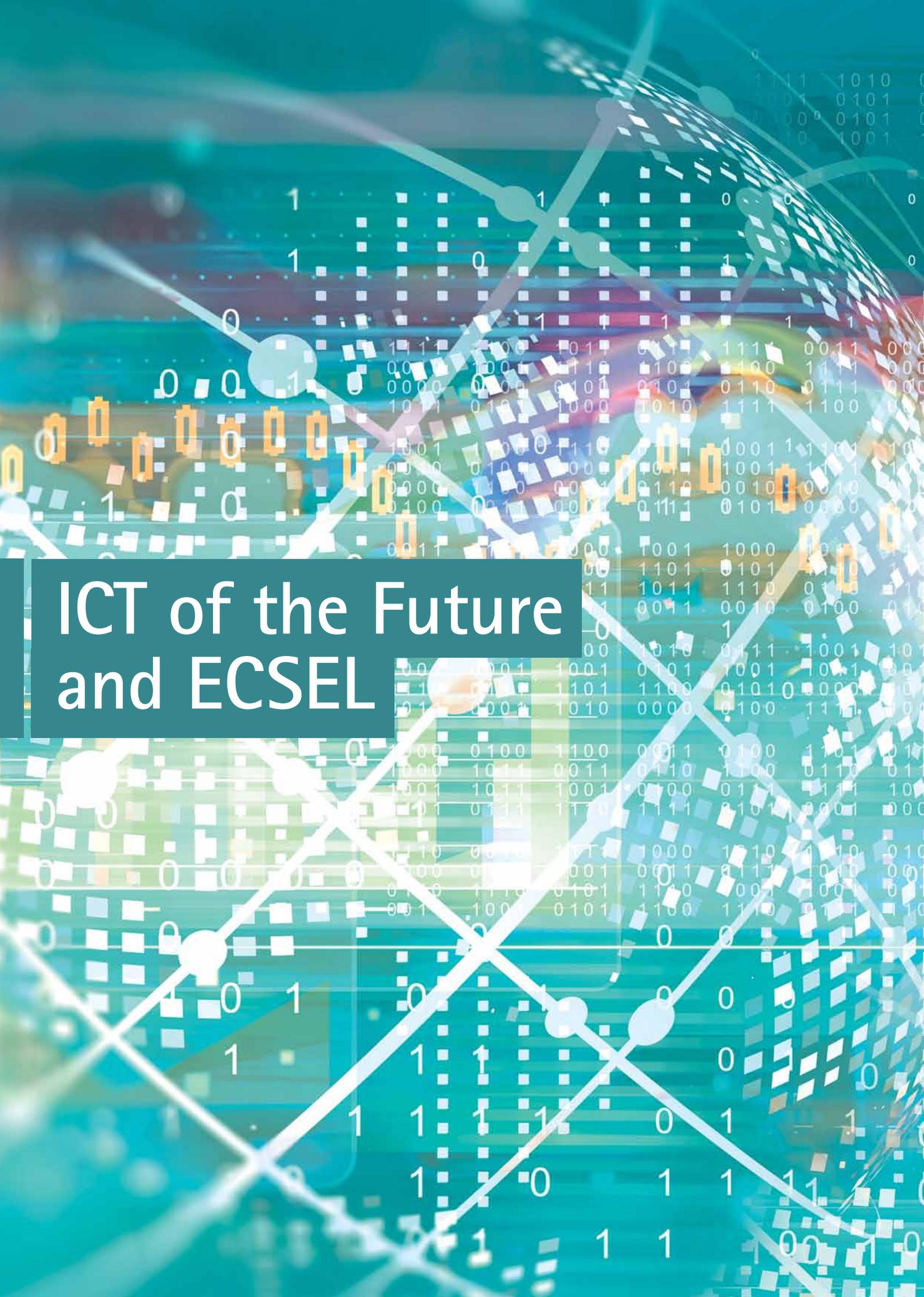
T03-03 Falls (further category)

T03-04 Person Localisation (further category)

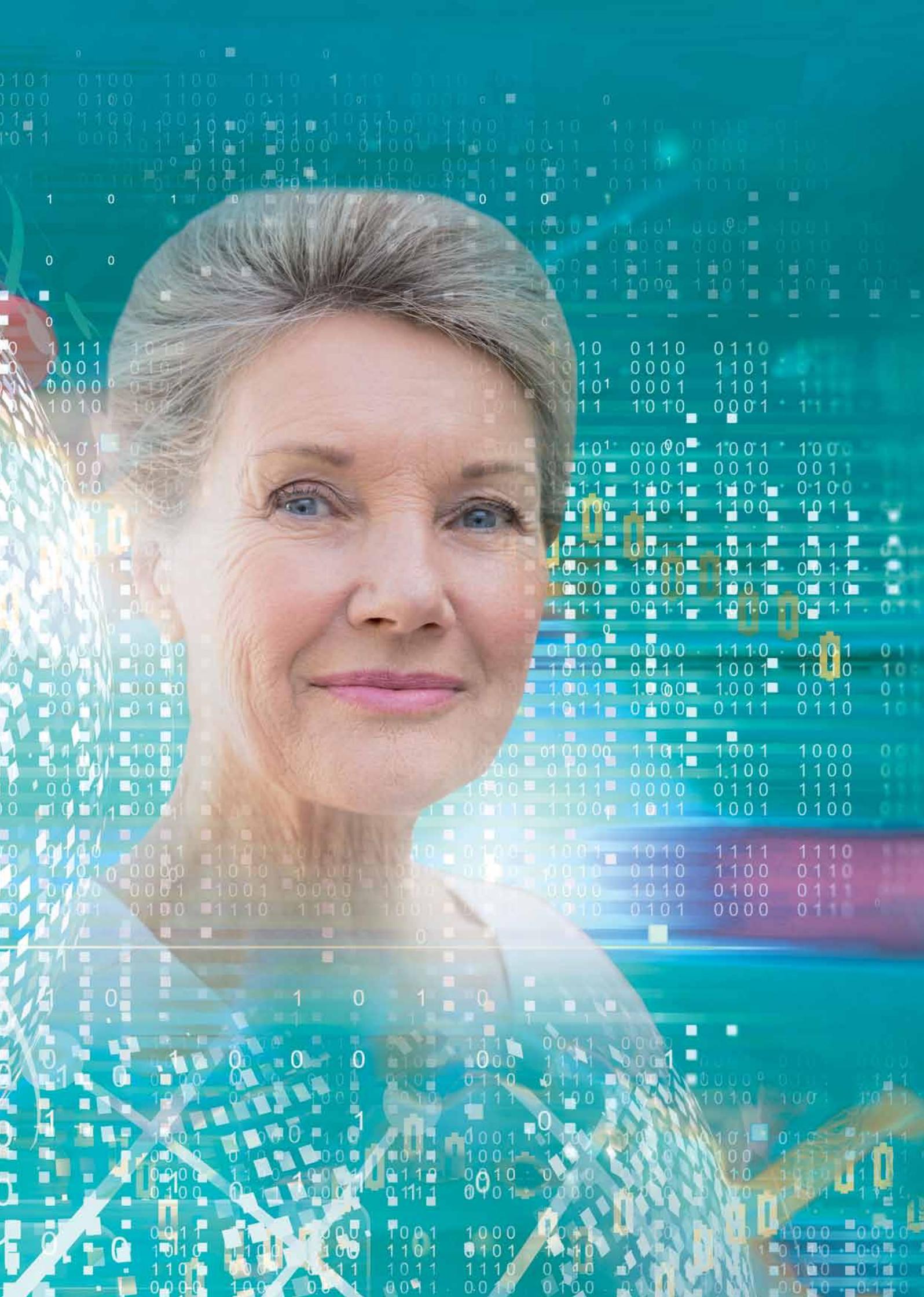
T03-05 Emergency Management and Alarms (further category)

(further category)

T08-03 Communication (further category)



ICT of the Future and ECSEL



Other Programmes of the "ICT of the Future" Funding Initiative

The "ICT of the Future" funding initiative of the Federal Ministry for Transport, Innovation and Technology (bmvit) includes two programme lines in addition to benefit and AAL:

- the national ICT of the Future funding programme designed to meet the need for technological research and development in selected topics and application fields;
- the ARTEMIS and ENIAC programmes co-financed by the European Commission which were merged into the ECSEL initiative in 2014.

The National ICT of the Future Programme

The Federal Ministry for Transport, Innovation and Technology launched the national ICT of the Future programme to promote research and development in information and communication technology, interlinked with applications and societal challenges. The programme supports ICT innovation in a comprehensive manner and aims to contribute towards the goal of moving Austria from the group of innovation followers to the group of innovation leaders, making it one of the most innovative countries in the EU. With its focus on generic ICT research and development, the programme pursues the following goals aimed at increasing innovative strength in this sector:

- develop lead technologies;
- achieve lead positions in competitive markets;
- establish and extend Austria's lead position as a research location;
- train and attract top scientists and research staff.

The Electronic Components and Systems for European Leadership (ECSEL) Programme

Through the ECSEL programme, the Federal Ministry for Transport, Innovation and Technology supports sophisticated innovation and technology development in information and communications technology in the following fields: micro- and nanoelectronics, embedded/cyber-physical and intelligent integrated components and systems. The projects are co-financed by the European Commission, with funding going to transnational cooperative projects of industrial research and experimental development.

The transnational calls are managed by the Joint Undertaking. National project partners must meet both general and national participation requirements.

Innovative Eye Gaze Research

The cooperative research project EyeControl explores eye gaze as a means of interaction between humans and complex industrial plants. The objective is to control machines by eye gaze.

Eye gaze research has recently made significant contributions in the fields of human visual perception, attention and non-verbal communication. Recent technological advances in affordable mobile tracker technology are rapidly opening up new applications. While research has so far focused primarily on usability studies and on assessing the effectiveness of advertisements or websites, the EyeControl project aims to create a whole new way of human-machine interaction in industrial manufacturing settings by introducing eye gaze as a modality of implicit and explicit interaction with industrial machines.

Eye-Tracking Approach for Eye-Gaze-Based Interaction

EyeControl aims at establishing eye gaze as an interaction modality with industrial machinery, building upon eye-tracking techniques developed within the research team of the consortium (opportunistic gaze sensing, real-time cognitive load estimation from gaze behaviour). It will ultimately develop a framework for gaze-only machine controls, opposing traditional augmented and mixed reality solutions to human-machine interaction in industrial manufacturing.

This project develops a methodological apparatus of universal, general purpose, re-usable control components (e.g. for pointing, selecting, manipulating, etc.), serving as a repository of plug-and-play modules to assist the creation of gaze-based controls in a wide range of industrial application domains (construction, maintenance, repair, quality assurance, etc.).

Technologically, EyeControl builds upon mobile eye-tracking sensors to (1) analyse gaze behaviour in real time, (2) evaluate perception and consciousness based on cognitive load models of industrial workers and (3) develop explicit and implicit interaction triggers as a means of gaze-based expressions of industrial machinery control.

Collaboration with World Market Leaders

EyeControl will be developed and validated together with world-leading Austrian and European industrial stakeholders (Industry 4.0) with the aim (1) of optimising product quality based on human visual inspections and (2) of optimising cognitive load sensitive, guided interactions in complex assembly tasks.

The anticipated research results are expected to lay the ground for a new generation of human-machine interaction modalities, with potential applications in other domains such as medical engineering and maintenance engineering.



Project Title

EyeControl – Eye-Controlled Machines Programme

ICT of the Future

Consortium Manager

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Further Project Partners

Research Studios Austria

Forschungsgesellschaft mbH

voestalpine Polynorm GmbH & Co.KG

voestalpine Stahl GmbH

Project Duration

2016–2019

Project Website

www.pervasive.jku.at

The EyeControl project investigates gaze-based human-machine interaction.



Industry 4.0 for Smart Production

Electronic components and systems are key drivers for economic growth in Europe. The European ECSEL project SemI40 explores smart production processes involving 37 partners from 5 countries.



The SemI40 project explores smart production processes to ensure competitiveness in semiconductor production.

Electronic components and systems (ECS) are key drivers for the innovative capability of large and small-sized companies in Europe, generating economic growth and creating meaningful jobs for citizens. The innovation project SemI40 addresses future challenges in the context of smart manufacturing. Extended use of communication and big data methods enable an Industry-4.0-centred approach with the aim of maintaining the competitiveness of semiconductor production "made in Europe" in the long term.

More Security, More Flexibility

A major aim of the SemI40 project is to balance system security and production flexibility in terms of line planning and configuration. SemI40 focuses on smart production using cyber-physical systems (CPS), with secure data traffic and early identification of malware playing a key role both within the factory and across the supply chain. The measures explored are designed to drastically reduce the risk and potential impact of malware on a historically developed production line.

Another major focus of SemI40 is to develop dynamic simulations of semiconductor manufacturing processes. This is a core aspect making it possible to react to changes in requirements, demands and technological solutions in a fast, flexible and reliable manner, enabling production to be planned efficiently and improving capacity utilisation, cycle times and quality of the final product.

Automated Decisions in the "Learning Factory"

Furthermore SemI40 aims at establishing a "learning factory", joining machine learning models and new algorithmic approaches to automate recurring decisions. The quality of decisions must not have a negative impact on the quality of the product. This should lead to an improvement in production efficiency and cycle times and optimal use of resources.

In addition to technical aspects, SemI40 will also explore the social impact of the innovations envisioned within the project on the jobs of the future. The requirements for training and future job

profiles and qualifications need to be taken into account at a very early stage. Because of the focus on production and the core competencies of the participating partners, the project will have a positive impact on high-tech jobs in the participating partners' regions in Austria, Germany, France, Italy and Portugal.



Project Title

SemI40 – Power Semiconductor and Electronics Manufacturing 4.0

Programme

ECSEL

Consortium Manager

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Further Austrian Project Partners

AIT Austrian Institute of Technology GmbH
Alpen-Adria University of Klagenfurt
AT & S Austria Technologie & Systemtechnik Aktiengesellschaft
AVL List GmbH
Fraunhofer Austria Research Gesellschaft mit beschränkter Haftung
Infineon Technologies IT-Services GmbH
KAI Kompetenzzentrum Automobil- und Industrieelektronik GmbH
Know-Center GmbH
Materials Center Leoben Forschung GmbH
PLANSEE SE
University of Applied Sciences Burgenland
Vienna University of Technology
VIRTUAL VEHICLE Research Center
Participating Countries
Austria, France, Germany, Italy, Portugal
Project Duration
2016–2019
Project Website
www.semi40.eu

Contacts

Programme Owner

Federal Ministry for Transport, Innovation and Technology (bmvit)
I 5 – Key Technologies for Industrial Innovation:
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Project sites in the benefit and AAL programmes