vienna business agency

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AAL

Technology Report

Europäische Union Investitionen in Wachstum & Beschäftigung. Österreich.

Contents

Foto: Wirtschaftsagentur Wien/David Bohmann

Introduction

Dear Readers,

The aim of Ambient Assisted Living (AAL, also Active and Assisted Living) is to maintain or improve the quality of life of older people through information and communication technologies (ICT) and to support their independence, especially within their own homes. Demographic change is one of the greatest societal, social and political challenges of the present and future. In order to cope better with the difficulties associated with this change, the development of new products and services has been triggered. AAL offers the opportunity to support a wide range of areas of life, from health and care to leisure activities. As a result, modern technologies that support older people and caregivers in their daily lives are becoming increasingly important. The combination of new technologies and social factors is essential for the development of AAL products in order to place people at the center of technology.

The team at the Vienna Business Agency

2

AAL areas

Intelligent assistive technologies can be used in a number of areas, in which they can provide support for senior citizens and their caring relatives. **TAALXONOMY**, a classification system for AAL applications and services, describes such application areas for intelligent ICT and services to support independence and self-determination in age.[1] Examples of AAL products and services include home emergency call systems, telehealth systems, navigation systems for pedestrians and wheelchairs with voice control. The classification system consists of eight main categories or areas of application, each subdivided into further subcategories.

Foto: Pixabay

Fundamentally, AAL technologies are subject to the requirement to cover the – especially in old age – increasing need for comfort and security to enable communication and integration within the social environment, and to be attractive for all generations through universal design. Accordingly, solutions should be designed in such a way that their usage is made possible for as many people as possible without specific adaptations, for example to impairments or different abilities.

[1] As part of the 9th call for proposals for the benefit programme by the Federal Ministry of Transport, Innovation and Technology (BMVIT), handled by the Austrian Research Promotion Agency (FFG), the partners SYNYO GmbH, University of Innsbruck and the European Academy of Bozen/Bolzano have carried out the study TAALXONOMY - Entwicklung einer praktikablen Taxonomie zur effektiven Klassifizierung von AAL-Produkten und Dienstleistungen. http://taalxonomy.eu

TAALXONOMY

Classification System for AAL Products and Services

www.taalxonomy.eu

TAALXONOMY: AAL PRODUCT AND SERVICE CATEGORIES

HEALTH & CARE

Health & Care comprises products and services which collect and manage medical data, which support **therapy** and **care** activities, as well as those assisting in **nutrition** and **personal hygiene.**

MOBILITY & TRANSPORT

Mobility & Transport consists of products and services that on the one hand serve as **transportation measures for persons** and **goods**, and on the other hand offers **travel information, navigation** and **orientation solutions.**

LIVING & BUILDING

The category **Living & Building** covers products and services for **water** and **energy supply, light management, room climate** as well as measures for design **barrier-free rooms.** Additionally, **maintenance** and **access control** are in this category.

WORK & TRAINING

Participation in the working life is covered by the category **Work & Training**. It contains **work supporting** measures and products and services for **job-specific learning and training**.

LEISURE & CULTURE

The category **Leisure & Culture** consists of products and services which enrich or enable recreational activities in leisure time, and cultural activities. **Sports, media and games** are covered, as well as **culture, religion and travelling**.

SAFETY & SECURITY

Safety & Security includes products and services which **prevent damages** and burglary or which support the user in cases of **falls**. Furthermore, **localisation** and **emergency management** is part of this category.

VITALITY & ABILITIES

The category **Vitality & Abilities** includes products and services that support, train or enable **basic physical, mental and social abilities** that are essential requirements for independent living.

INFORMATION & COMMUNICATION

Information & Communication contains products and services which on the one hand **present knowledge** and offer **advisory functions**, and on the other hand support and enable **interpersonal communication** and **organisation** of daily living.

Download via www.taalxonomy.eu

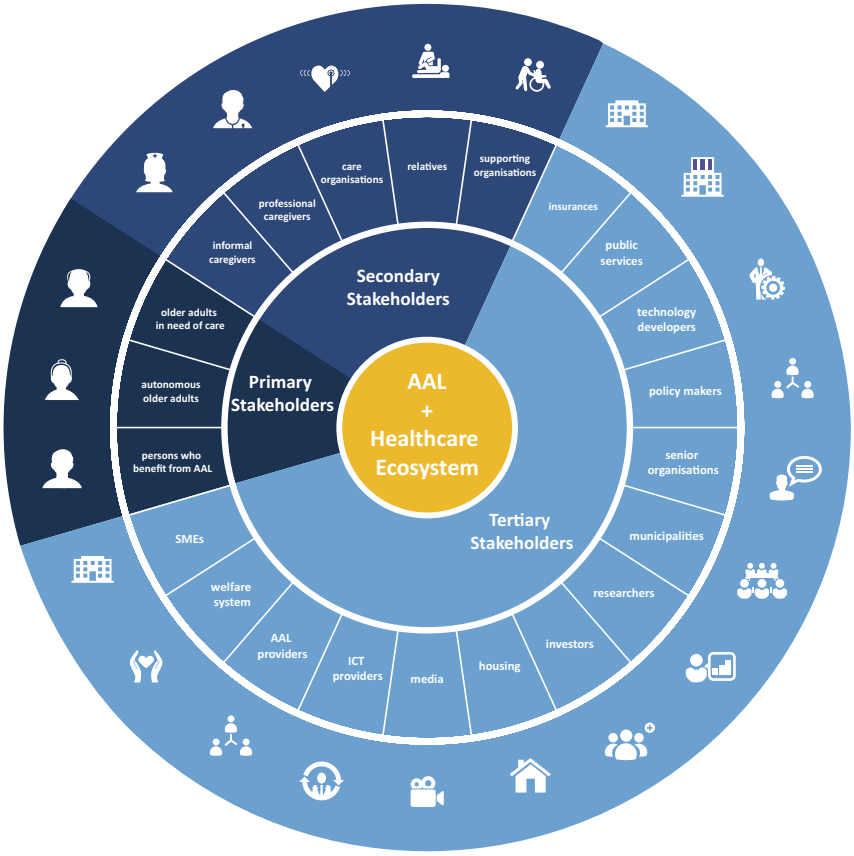
Designed by SYNYO

Figure 1: TAALXONOMY classification system

3

AAL market

AAL is situated in a complex field of tension between applied research and the development of marketable solutions, in which different actors, perspectives and interests are represented. In addition, the AAL market lies in a very specific ecosystem, which is located in the area of conflict between social care, health care, mobility and housing/home[2]. This ecosystem consists of stakeholders from professional care, and health & social care providers (hospitals, doctors, insurance companies, pharmacies, clinics, etc.), informal care networks (relatives, NGOs, voluntary groups, churches, etc.), industry and technology companies, research institutions and innovation companies, as well as policy makers and investors. It is, therefore, all the more important that cooperation and exchange between these stakeholders take place.[3]



AAL Ökosystem / AAL Vision 2025 / designed by SYNYO

Figure 2: AAL Stakeholder Ecosystem

[2] AALIANCE-2 (2014). Ambient Assisted Living Roadmap. In: AALIANCE-2 Project, Deliverable 2.7, September 2014. http://www.aaliance.eu/sites/default/files/AA2_WP2_D2%207_RM2_rev5.0.pdf

[3] Oliveira, A. I., Ferrada, F. & Camarinha-Matos, L. M. (2013, October). An approach for the management of an AAL ecosystem. IEEE 15th International Conference on e-Health Networking, Applications & Services (Healthcom), 601-605.

The AAL market can be divided into two submarkets according to the complex stakeholder landscape: On the one hand, there is support of necessary care and nursing as a focus of the **public sector**, and on the other hand there are (individual) offers for the preservation of health (prevention), work and leisure, household, comfort and lifestyle etc. in the **consumer market**.

While the complexity of the AAL ecosystem can pose challenges, the high purchasing power of the senior group is an incentive for companies to invest in the AAL sector.[4] The potential for the AAL market in Austria is estimated at € 840 million and the annual demand potential at € 350 million.[5] For Europe, the purchasing power of over 65-year-olds in Europe is estimated at over € 3,000 billion.[6]

According to a forecast by the United Nations, the share of the 65+ generation in Europe will grow to 28% of the total population by 2050. In Austria, the proportion of the population aged 65+ will increase to 25% of the total resident population by 2035.[7]

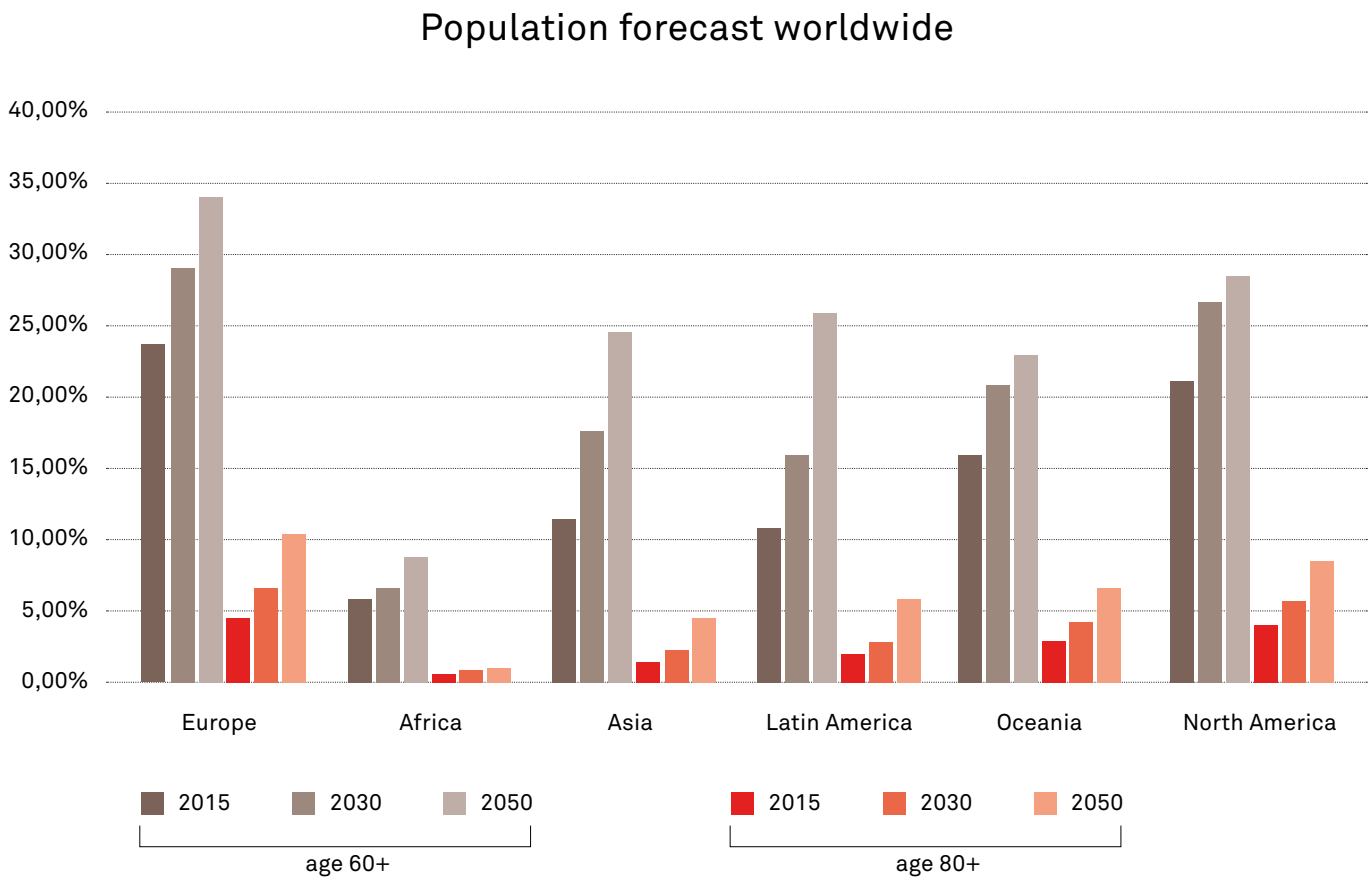


Figure 3: Global population forecast
Source: United Nations (2015). World Population Ageing.

[4] Rauther, E. (2018). Ambient Assisted Living - barrierefreie Technologie für Senioren. Stadt-Wien.at. https://www.stadt-wien.at/immobilien-wohnen/smart-home/ambient-assisted-living.html

[5] WPU (2013). Studie zur Geschäftsmodellentwicklung für den AAL-Markt unter Berücksichtigung der österreichischen Rahmenbedingungen. https://www.ffg.at/sites/default/files/allgemeine_downloads/thematische%20programme/aal-geschaeftsmodelle.pdf

[6] Europäische Kommission (2017). Growing the Silver Economy in Europe. https://ec.europa.eu/digital-single-market/en/news/growing-silver-economy-europe

[7] Riedel, M. & Hofer, H. (2018). Zukunftschance Demographie. Projektbericht/Research Report. Wien: Institut für höhere Studien. http://www.aal.at/wp-content/uploads/2016/02/Studie-Zukunft-Demografie20180316.pdf

By comparison, their share was still 16% in 2007.[8] By 2060, one third of the population of Europe will be over 65 years of age.[9] Looking at the forecasts up to 2050 in global terms, it can be seen that population ageing is progressing most markedly within Europe, closely followed by Russia (24%) and the USA/Canada (22%). In Latin America/Caribbean (19%) and Asia (18%), ageing is less pronounced. Africa has the lowest population ageing rate (7%).[10]

In addition to demographic change, drivers for the AAL market as a whole include government incentives and subsidies, the growing interest of consumers in opportunities to support healthy and active ageing, the growing acceptance of modern technologies and new technological developments. At the same time, there are obstacles that hamper the market, including the complex regulatory environment within the EU, especially when it comes to care and support. Data protection and privacy, interoperability and fragmentation of the market as well as a lack of technical skills are further difficulties for the AAL market.[11]

3.1 International

Costs for care and health will rise accordingly – hence, growth can also be expected for the AAL market. In 2017, the AAL market adds up to € 186 million and is expected to grow to € 1,384 million by 2021, a sevenfold increase in four years. In 2017, the EU market accounted for 21% of the global AAL market, and by 2021 the size of the EU market is expected to grow to 26% of the global market. The country with the largest market share is the USA with a share of 60% (€ 539 million) in 2017 and 40% (€ 2,132 million) in 2021. The AAL market in Asia will also grow rapidly: from € 111 million in 2017 to € 1,174 million in 2021.[12]

The largest projected AAL markets in the EU are Germany with 31% (€ 383 million), the UK with 21% (€ 232 million), France with 13% (€ 180 million) and Italy with 6% (€ 139 million) in 2021, which together account for 51% of the total EU market. Households with AAL technologies in these countries range from 0.2% in Italy to 0.5% in Germany in 2017, and market penetration is expected to rise to 1.6% in Italy and 3.1% on average by 2021. The EU country with the highest proportion of AAL in households is Estonia with 0.7% in 2017 and an expected household penetration of 3.5% by 2021. The EU-wide AAL penetration in 2017 corresponds to the global average (0.3%); however, it is expected to be above the global average by 2021, rising to 1.8%.[13]

The share of households in the EU with AAL equipment and services will, however, still be significantly lower than the US average, where 5.3% of households are expected to have AAL equipment by 2021. However, the rapid market penetration of smart home technology is expected to increase beyond 2020/2021 when a "new" generation of older people, more tech-savvy than the previous generation, will invest in home automation solutions. Increased consumer awareness and technological developments will also drive the development of EU AAL markets.[14]

[8] Hoßmann, I., Karsch, M., Klingholz, R., Köhncke, Y., Kröhnert, S., Pietschmann, C. & Sütterlin, S. (2008). Die demografische Zukunft von Europa. Wie sich die Regionen verändern. Berlin: Berlin-Institut für Bevölkerung und Entwicklung. https://www.berlin-institut.org/fileadmin/user_upload/Europa/Europa_d_online_kl.pdf

[9] Europäische Kommission, 2017

[10] Hoßmann et al. 2008

[11] Varnai, P., Farla, K., Glasgow, D., Grange, S., Romeo S. & Simmonds, P. (2018). AAL Market and Investment Report. A study prepared for the AAL Programme (Active and Assisted Living) by Technopolis Group. Ambient Assisted Living Association, Brussels.

[12] Varnai et al. 2018.

[13] Ibid.

[14] Ibid.

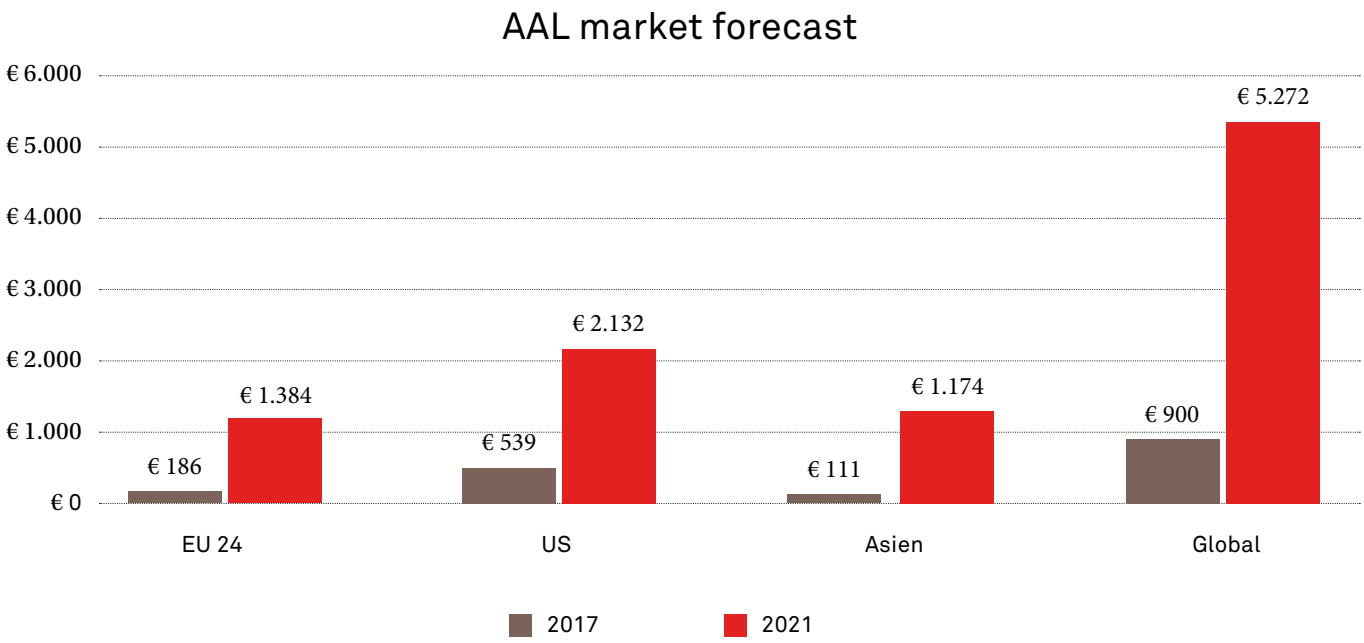


Figure 4: AAL market forecast
Source: Varnai et al. 2018.

3.2 Austria

For the AAL market in Austria, the area of care and nursing is particularly relevant: Due to demographic developments, the proportion of older adults is rising and so are the age-related costs of care and nursing. Main focus here is on counteracting the rising costs of support and nursing care. A study assumes a cost increase of 32.3% between 2014 and 2020, 57.6% by 2025 and 105% by 2030. This increase was calculated on the basis of the demographic forecast of Statistik Austria (2015) and an assumption of a cost development of +2% per year, a shift of one year in the demand of over 65-year-olds from 2025 onwards, and a slight drop in informal care by relatives of 70% by 0.2 percentage points per year, especially due to the increase in the professional activity of women.[15] As mentioned in the previous section, the proportion of 65+ year olds will increase to 25% of the total Austrian population by 2035. [16]

The average monthly consumption expenditure of the Austrian population in 2014/15 added up to € 2,990. Related to this, the average expenditure for the health item was 3.8%, which corresponds to € 113.62 per month. Looking at expenditure by household size, households with only one person spend an average of € 1,970 per month on consumption. The proportionate costs for health are € 77. The 2014/15 consumer survey shows that the percentage of health expenditure in relation to total expenditure increases steadily with age. This becomes clear when comparing the average monthly expenditure of generations aged 50-80 and over (4.78%) with that of younger generations aged 25-49 (2.8%).

[15] Famira-Mühlberger 2017c, 7, 22

[16] Riedel & Hofer 2018.

"Social Businesses" have a special potential in the AAL market. According to a study conducted by the Social Entrepreneurship Center at the Vienna University of Economics and Business, there were 1,200 to 2,000 "Social Businesses" in Austria in 2015, depending on the criteria applied.[17] These mostly include long-established organisations with a focus on the social and health sector, in particular the associations Arbeit plus (until 2016 Bundesdachverband für Soziale Unternehmen Austria) and Sozialwirtschaft Österreich. Organisations in the social and health sector (social services, care providers) are already in the focus of funded AAL projects and community education, but with a relatively low mobilising power. According to expert estimates, social businesses are expected to increase to 3,000 by 2025. However, this would require supporting measures such as incubators, start-up financing, adjustments to non-profit and foundation law, networking and cooperation between social enterprises and with other sectors. These measures largely correspond to the "10 Kernpositionen für mehr gesellschaftliche

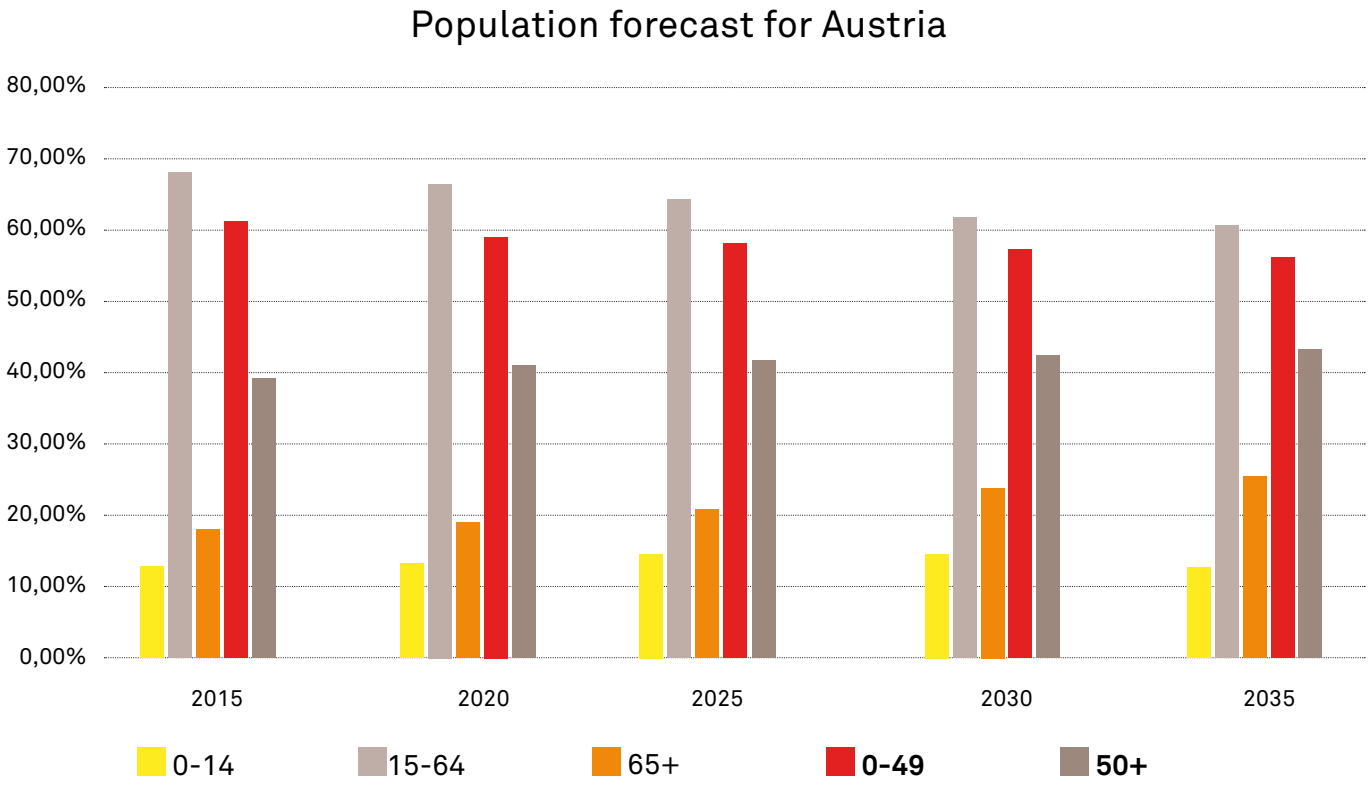


Figure 5: Population forecast for Austria
Source: Riedel & Hofer, 2018; Statistik Austria, Bevölkerungsprognose 2017

Innovation und Sozialunternehmertum in Österreich" ["10 Core positions for more social innovation and social entrepreneurship in Austria"], published in June 2014 on the occasion of the multi-stakeholder summit "Gesellschaftliche Innovation und Sozialunternehmertum" ["Social innovation and social entrepreneurship"] by Ashoka, Bundesdachverband für Soziale Unternehmen (BDV Austria), Impact Hub Vienna, Industriellenvereinigung and Rat für Forschung und Technologieentwicklung.[18]

[17] Vandor et al. 2015

[18] Ashoka, BDV Austria, Impact Hub Vienna, Industriellenvereinigung & Rat für Forschung und Technologieentwicklung (2014). 10 Kernpositionen für mehr gesellschaftliche Innovation und Sozialun¬ternehmertum in Österreich. Juni 2014. Available at: https://arbeitplus.at/wordpress/wp-content/uploads/2017/12/10-Punkte-fuer-einen-inklusiven-Arbeitsmarkt_20171228.pdf

3.3 Silver Economy

As an "umbrella market", AAL represents a fragmented market offering a wide variety of products and solutions. Relevant insights can be gathered by drawing a comparison to the Silver Economy. The Silver Economy is the part of the general economy and the sum of all economic activities that serve the needs of people aged 50 and older, including products and services directly bought by this group, and other economic activities that generate these expenditures.[19] The Silver Economy covers all sectors of the economy, including health and nutrition, leisure and well-being, finance and transport, housing, education and employment, as well as the public and private sectors. The AAL market is therefore an important part of the Silver Economy, which is seen as a leading and above all cross-sectional market – i.e., all market segments can benefit. Within the "Silver Economy", the AAL market, which has been heavily dominated by the public sector to date, could expand considerably.

As for AAL, the main driver, especially for the political occupation of the issue, is the rise in public sector costs for care (pensions), health and long-term care for older adults. In Europe, this expenditure already amounts to 25% of the gross national product or over 40% of public expenditure. This expenditure will rise sharply in the coming decades, especially for long-term care.[20]

Some countries within the EU have already strongly occupied the Silver Economy, most notably France. The EU Silver Economy in 2015 is estimated at € 3.7 trillion. Slightly more than 10% of this total is public spending on older people. Taking population projections into account, the study estimates that the Silver Economy in the EU will grow by around 5% per year in 2025, amounting to € 5.7 trillion.

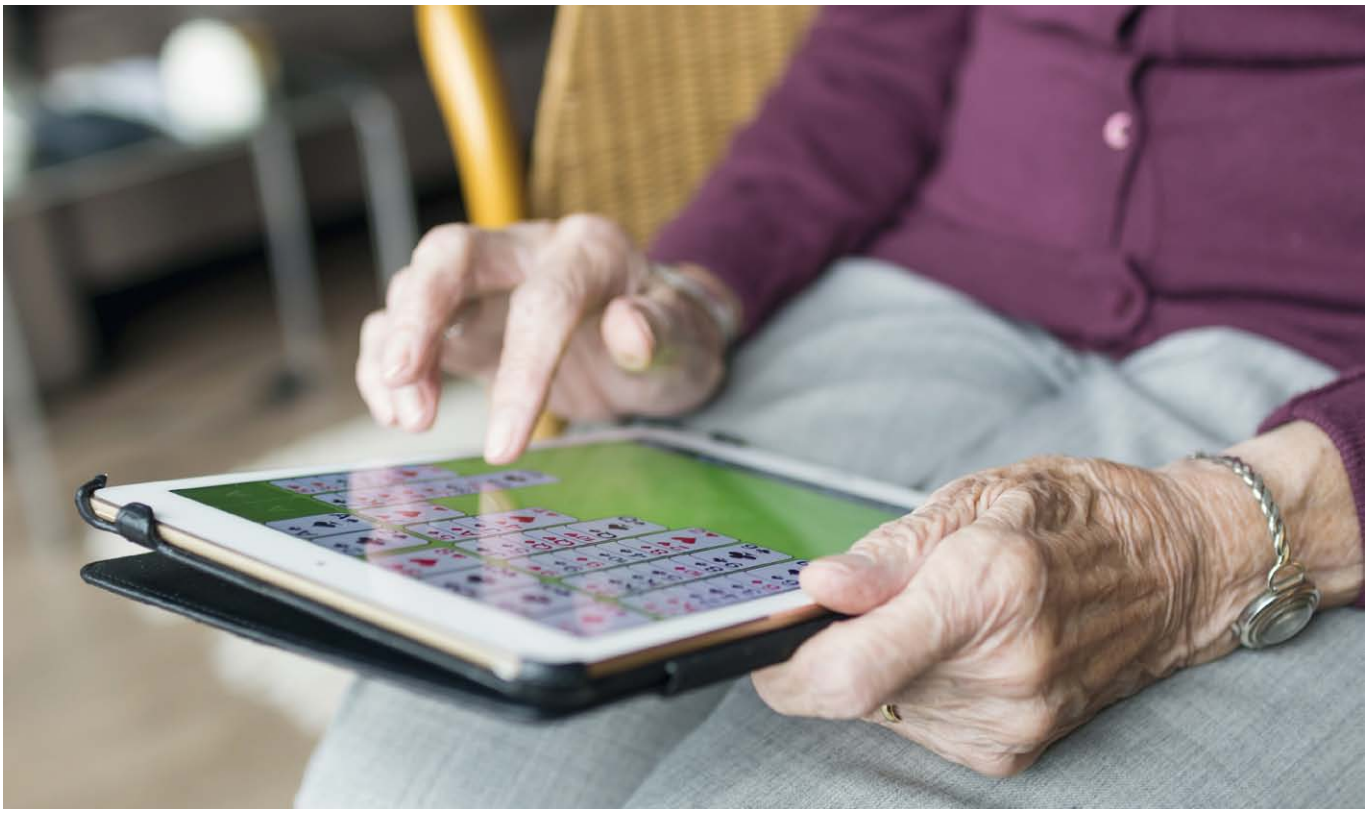


Foto: Pixabay

[19] Directorate-General for Communications Networks, Content and Technology (European Commission), Oxford Economics & Technopolis (2018). The silver economy. DOI 10.2759/640936.

[20] European Commission (2015). The 2015 Ageing Report. Economic and budgetary projections for the 28 EU Member States (2013-2060). European Economy 3/2015. Brussels. http://ec.europa.eu/economy_finance/publications/european_economy/2015/pdf/ee3_en.pdf

4

The future of AAL in Austria

An evaluation of Austria's participation in the AAL Joint Programme[21] , carried out for the period 2008-2013 shows that Austria is one of the most active countries in the AAL Programme: Austria ranks third in terms of the number of funded projects and project partners by country. This shows the high relevance of AAL in the Austrian funding landscape. In addition, the evaluation has shown that Austrian project partners have a disproportionately high level of participation, particularly in the areas of mobility & transport and health & care. The Austrian participation in the AAL JP was linked to the goal of improving the performance and networking of Austrian companies, research institutions and services of general interest within the thematic framework of the programme through cooperation and with the involvement of users also in an international context.

4.1 Current trends & core technologie

AAL solutions are information and communication technologies (ICT) that support a healthy and independent life of older people as age-appropriate assistive systems. The development and application of such solutions should particularly contribute to maintaining or improving the quality of life of older people. As horizontal technologies, ICT-based AAL applications are possible in all areas of life; the spectrum ranges from simple applications with adaptation for AAL (e.g. mobile phones for older people) to complex systems with specific functions for AAL (e.g. intelligent living environments). In a broader sense, AAL can subsume sub-areas from many subject areas, such as Internet of Things (IoT), robotics, accessibility, care, eHealth. However, certain core technologies with great relevance for AAL can be identified.

Wearable Electronics, i.e. portable computer devices attached to the user's body are a highly relevant technology for the AAL area. Fitness trackers and smartwatches offer the possibility of monitoring body and vital data as well as locating individuals, in order to enable, for example, people with dementia in an early to middle stage to live as independently as possible and to guarantee their safety.

IoT is another core technology for the AAL sector, especially in the context of Smart Homes and Home Automation, which is also attributed a large market share. Statista forecasts that the market segments around smart homes could generate worldwide sales of around € 22.854 billion in 2017, of which € 13.197 billion, the majority, are

[21] Geyer, A. & Good, B. (2016). Evaluierung der österreichischen Beteiligung am Ambient Assisted Living Joint Programme (AAL JP 2008 – 2013). Endbericht. Wien.

in the USA. The growth potential currently shows an annual plus of 33%. In Austria, a turnover of around € 114 million is expected for 2017; the potential for growth is estimated at 38.7% annually.

In addition, a number of so-called **"Emerging Technologies"** are closely linked to the AAL sector. One of these technological developments is the field of **assistive robotics**. IDC, a technology research company, predicts that global spending on robotics and related services will increase from more than $71 billion in 2015 to $135.4 billion in 2019. **Virtual Reality** (VR) and **Augmented Reality** (AR) offer new possibilities in the AAL field, for example for rehabilitation or to support people with cognitive impairments. Finally, the development of **Artificial Intelligence** (AI) and related approaches such as context awareness, computer vision, machine learning etc. have the potential to provide users with smarter, more flexible and more natural services.

Closely related to AAL are the areas **eHealth and mHealth** as well as **Telecare and Telehealth**. These consist in the usage of digital technologies in healthcare, for diagnosis, care, nursing and/or monitoring.

At the centre of all AAL solutions is the close involvement of users in the development of solutions through **User Centered Design** – this not only guarantees proximity to customers and users, but also ensures that solutions meet the needs of users, especially in an area that wants to bring technology closer to a difficult target group – older adults.

4.2 AAL Vision for Austria 2025

2In 2018, an **AAL Vision 2025 for Austria** [22] was developed in response to a call for proposals from the benefit programme of the Federal Ministry of Transport, Innovation and Technology (bmvit) and the Austrian Research Promotion Agency (FFG). The consortium of three partners – SYNYO GmbH, Salzburg Research Forschungsgesellschaft m.b.H., Österreichische Plattform für Interdisziplinäre Alternsfragen (ÖPIA) – identified relevant target areas, sub-objectives and measures for the achievement of objectives for the horizon 2025 on the basis of a comprehensive literature analysis, quantitative and qualitative surveys as well as two validation workshops with relevant stakeholders from the AAL sector. Based on the findings of the study, the AAL Vision 2025 can be summarised as follows:

In 2025, simple, cost-effective and customizable technologies to ensure high quality of life into old age will be available to us people in Austria. Self-determined life, social participation, dignified ageing and modern care concepts are supported.

Older people are accompanied by appropriate treatments on the move and at home. These are developed in close cooperation between research, companies and user groups, interested parties can try them out and test the application.This is done under consideration of ethical aspects and in the sense of an open innovation approach.

Optimal framework conditions, created by politics, administration and representatives of interests, promote the sustainable dissemination of affordable solutions to institutions and citizens while expanding existing ecosystems and creating new ones.

The AAL Vision 2025 focuses on the primary users of AAL solutions, i.e. older people who are supported by ICT in order to be able to live independently and in their own homes for as long as possible. Secondary stakeholders – individuals and organisations that are in direct contact with primary users as formal or informal carers, e.g. family members, friends, neighbours and care organisations – and tertiary stakeholders (public or private organisations that are not in direct contact with primary users) are also considered.

[22] AAL Vision 2025 für Österreich.
https://www.aalvision.at/

These different stakeholder groups have different needs, and therefore differ in their assessment of which areas of life should be supported by AAL solutions. Stakeholder groups agree, however, that the primary users are at the centre of AAL and that the development of AAL solutions for and with the users as well as increasing acceptance are the most important goals for AAL. Across all stakeholder groups, the areas of everyday support and (self-)care as well as care and nursing are regarded as the most important. However, there are differences in the emphasis given to transport and mobility as well as information and communication, which were attributed high priority by primary stakeholders and comparatively low priority by tertiary ones. In contrast, tertiary stakeholders prioritised safety and protection. It has been shown that certain areas of life are central to primary and secondary stakeholder groups because they are associated with existential necessities. Safety, care and support in particular can be regarded as key aspects of AAL. Therefore, existentially necessary areas are compared with those that are perceived as "secondary" or "optional" – even though they are recognized as relevant – such as communication, mobility, entertainment, etc. The results show that in the understanding of AAL, a "deficit model of ageing" still exists. This is a scientifically outdated and obsolete psychological theory of ageing that defines ageing as a physical and cognitive degradation process. One of the most important goals of the AAL Vision 2025 is, therefore, to overcome such a model and achieve a positive connotation of age(s).

For the **AAL Vision 2025**, there are four target areas in addition to such a confirmation of a positive age picture: (1) Participation and knowledge transfer (i.e. the development of AAL solutions for and with users and improved communication about AAL), (2) a proactive policy and the extension of the action framework for AAL, (3) support and facilitation of care and promotion of age-appropriate living with socially innovative AAL solutions, as well as (4) increasing market opportunities, promotion of enterprises and the creation of future security. The overall objective of AAL – today and 2025 – is to develop simple, cost-effective and individualisable technologies that enable quality of life into old age.

Relevant measures to achieve this goal and the individual target areas were identified. For example, an improved, strategic communication about AAL products and services (information campaigns). It is particularly important that the intended users get to know solutions and understand their benefits, and, at the same time, to improve the image of AAL. The expansion of communication is about conveying the positive use of technologies in old age and thus overcoming disinterest and rejection. Closely linked to this is a proof of usefulness and effectiveness of AAL solutions through long-term impact studies – this serves to increase acceptance and knowledge transfer as well as a proactive policy and increase the market opportunities of AAL solutions. The testing, demonstrating and getting to know new technologies, e.g. through showrooms, roadshows, or similar, but also through the real implementation of technologies in, for example, nursing homes, is also a core measure. This includes the expansion of a consulting system, the introduction of non-technical users and training for AAL solutions. This, then, can also contribute to overcome or reduce the "digital divide". Strong foundation for all measures is that all technologies focus on the intended users – i.e. that their needs, limitations and expectations are taken into account as well as that the affordability of AAL solutions is increased to take account of the socio-economic divide. To this end, it is important that technology developers build on existing technologies and systems and integrate existing systems. Older people and, both, formal and informal caregivers need to be involved in development to address specific needs and jointly develop solutions. The open innovation approach offers a good opportunity to turn users into designers. This also increases the personal user value and thus the acceptance of AAL solutions. This also means that user-friendliness is a fundamental aspect. Relevant for this is furthermore a Design for All-approach, which enables all people to use a product without individual adaptation or special assistance, regardless of a person's abilities or needs.

AAL in Vienna

The City of Vienna offers a range of opportunities for the various stakeholders in the AAL sector: on the one hand, companies and research institutions are supported by grants, and on the other hand, AAL fits into a broad spectrum of initiatives and strategies. The Innovation Cities Global Index 2016-2017 ranks Vienna among the top 10, after cities such as London, New York and Tokyo – especially the city's good IT infrastructure provides a framework for innovation, research and development, which is also fundamental for the development of AAL solutions.

5.1 Initiatives, networks and institutions

The **Viennese AAL test region WAALTeR**[23], which runs from December 2016 to November 2019, addresses demographic and health policy challenges and combines the ubiquitous digitalisation of everyday life with the requirements of current Viennese concepts. The focus is on prevention and care strategies in the urban context, as well as on practicable and integrated solutions that are tailored to the users and their living environment. To this end, service packages will be developed that enable older people to lead a self-determined life in their familiar environment with a high quality of life – tailored to the respective needs of the users. 83 Viennese test households will be equipped and evaluated with the integrated WAALTeR Tablet system solution. 35 control households are also part of the empirical-experimental evaluation study, which will be carried out over a period of 18 months. The aim of the evaluation is to verify the effectiveness of the measures taken.

On the initiative of the bmvit in April 2012 the platform **AAL Austria**[24] – based in Vienna – was founded with the aim of networking the heterogeneous stakeholder landscape in the field of AAL in order to promote the establishment and expansion of an Austrian AAL community and the visibility of AAL at all levels of public perception.

The **Österreichische Plattform für Interdisziplinäre Alternsfragen (ÖPIA) [Austrian Platform for Interdisciplinary Ageing Issues]**[25] is a national science platform based in Vienna that deals with questions of ageing and the perspectives of ageing in society. This includes analyses of demographic ageing, the elaboration of comprehensive, scientifically sound and politically relevant strategies for (Austrian) society in an international context, the strengthening of public awareness, the improvement of the social image of ageing and the discussion of relevant issues as well as the function as a contact point and link between research, practice and politics in questions of ageing and generations.

The **Fonds Soziales Wien (FSW) [Vienna Social Fund]**[26] supports senior citizens, particularly in the area of care and assistance, by offering advice on care and assistance services in Vienna. This also includes the best possible care within one's own home, as well as the support of caring relatives.

[23] Wiener Testregion WAALTeR. http://www.waalter.wien/

[24] AAL Austria. http://www.aal.at/

[25] Österreichische Plattform für Interdisziplinäre Altersfragen. http://www.oepia.at/willkommen

[26] Fonds Soziales Wien. https://www.fsw.at/

5.2 Education and Research

AAL, as an interdisciplinary field of applied research offers many opportunities for education, research and development. At the core of all activities are the users, who are to be guaranteed an independent life in their own environment.

The **University of Applied Sciences Campus Vienna** offers research activities with a focus on the development of technology-supported everyday objects, smart living spaces, target group-oriented health technologies, innovative traffic concepts and technologies to support care and therapy for the target group of older people, their environment (e.g. informal and professional caregivers, therapists, etc.), and the entire stakeholder ecosystem. A number of study programmes are linked to this interdisciplinary field of research – from Advanced Integrative Health Studies and Health Assistive Engineering to Physiotherapy and Occupational Therapy.

Several institutes at the **University of Applied Sciences Technikum Wien** are involved in AAL projects and offer corresponding training opportunities, such as the Institute for Embedded Systems & Cyber-Physical Systems and the Institute for Biomedical Engineering. The Smart Homes and Assistive Technologies programme is also dedicated to technologies for people with special needs and older adults.

The **Technical University Vienna** is also involved in some AAL projects, and especially the Faculty of Computer Science and the Human Computer Interaction (HCI) Research Unit at the Institute of Visual Computing and Human-Centered Technology offer AAL-relevant fields of education.

The **Austrian Institute of Technology**, as Austria's largest Research and Technology Organisation (RTO), is involved in a large number of AAL projects. Several centres are dedicated to AAL, including the Center for Innovation Systems & Policy, the Center for Health & Bioresources, and the Center for Technology Experience.

Other research institutions that carry out projects in the AAL area include the Institute for Technology Assessment of the **Austrian Academy of Sciences**, the **Vienna University of Economics and Business** or the **University of Vienna**.

5.3 Activities and Events

The innovation platform **AAL Austria** supports numerous activities, especially in the context of the Federal Government's RTI strategy and the associated work of the bmvit. This includes active involvement in numerous AAL conferences and workshops (local and international), as well as, for example, the organisation of its own Austria-wide lecture series "Seminar Series".

In addition, there are events in Vienna, some of which take place regularly and contribute to networking the broad stakeholder landscape. The Vienna Business Agency, the Austrian Research Promotion Agency (FFG), AAL Austria, and other initiatives, networks and organisations provide information on relevant events in the AAL area.

5.4 Use and framework conditions

The City of Vienna has various initiatives that are related to AAL in a narrower or broader sense. In 2014, the City of Vienna launched the framework strategy **Smart City Vienna**[27] , a roadmap up to 2050, which has been set in order to set impulses and guidelines for urban development. Inclusion and mobility are two areas which are also of particular importance in the context of AAL.

With the **Digital Agenda Vienna**[28], the City of Vienna has presented a strategy on how to deal with the process of change triggered by digitisation. In a collective working process between citizens, the Vienna City Administration and entrepreneurs, an agenda was drawn up with the help of a participation platform, which is still available for feedback and discussion. Projects and applications such as the official wien.at Live App, the DigitalCity. Vienna initiative or a smart infrastructure for everyone (more than 400 wien.at Public WLAN hotspots) have already been implemented from the Digital Agenda Vienna. In addition, Agenda 2016 was expanded to include the topic "Internet of Things".

In addition, **Urban Innovation Vienna**[29] has been a new competence centre for urban future issues. Innovative strategies for coping with the diverse and complex agendas of a city are developed in dialogue with those responsible in politics, administration and business. The core task of Urban Innovation Vienna is to make a contribution to mastering future urban tasks with interdisciplinary expertise. Among the various topics to which Urban Innovation Vienna is dedicated, the areas "New Housing", "Digital City" and "Future Mobility" are particularly relevant for AAL in Vienna.

The City of Vienna also provides a **Designee for Senior citizens (SeniorInnenbeauftragte)**[30], who acts as a mediator between society, the city and politics and takes care of the concerns of senior citizens in Vienna. In addition to representing the interests of senior citizens, she also deals with the placement of topics relevant to senior citizens in all areas of the city, including the preparation and coordination of concepts and projects. The **Senior citizen office (SeniorInnenbüro)** is also an information, contact and counselling centre for people in the post-work phase of life, active senior citizens and older Viennese who need help, as well as for their relatives and caregivers. In particular, information is provided on the topics of housing, finance, health, fitness, care and support as well as voluntary social commitment, and support is provided in finding the right contact point.[31] Since 1996, Vienna has also had a **Viennese consultative committee for senior citizens (Wiener Seniorenbeirat)**[32], which deals with the affairs, wishes and complaints of senior citizens, passes on proposals to the city and advises senior citizens.

[27] Magistrat der Stadt Wien (2014). Smart City Wien. Rahmenstrategie. https://smartcity.wien.gv.at/site/wp-content/blogs.dir/3/files/2014/08/Langversion_SmartCityWienRahmenstrategie_deutsch_doppelseitig.pdf

[28] Smart City Wien. https://smartcity.wien.gv.at/site/digitale-agenda-wien-3/

[29] Urban Innovation Vienna. http://www.urbaninnovation.at/de

[30] Designee for Senior Citizens (SeniorInnenbeauftragte). https://www.wien.gv.at/sozialinfo/content/en/10/InstitutionDetail.do?it_1=2098237

[31] Senior citizen office (SeniorInnenbüro). http://senior-in-wien.at/

[32] Viennese consultative committee for senior citizens (Wiener Seniorenbeirat). https://www.senior-in-wien.at/p/ueber-uns

6

Services of the Vienna Business Agency

The Vienna Business Agency offers companies in Vienna a „360° service“. This includes support and advice, workshops and further coaching for start-ups, assistance in the search for business or office space, contacts to potential partners in the technology scene or the creative industries. The Vienna Business Agency also positions Austria's capital in the international business environment, assists international companies settling in Vienna and is the first point of contact for expats arriving in Vienna.

The Vienna Business Agency further offers funding opportunities for AAL projects in various funding programmes. The **Research programme** funds research and development projects (R&D projects) within the framework of special calls. The **Innovation programme** supports companies that develop new or significantly improved products, services and processes or carry out organisational innovations. For the preparation of large projects with several (international) partners, the **R&D Cooperation Initiation programme** is an ideal choice. Internationalisation promotes companies that open up new markets.

In addition, the Vienna Business Agency has been organising the **Vienna Research Festival** since 2008. Its aim is to show a broad Viennese audience what is being researched and developed in Vienna together with Viennese universities, universities of applied sciences, companies and non-university research institutions. Over 69,000 Viennese people have been welcomed to research festivals over the past ten years. More than 140 companies, universities, private and university of applied sciences institutes have already taken advantage of these events to present their research projects and innovative products to an interested public and to make contact with potential customers.

Companies from Vienna

Companies AAL

The following table provides a non-exhaustive alphabetical overview of companies from Vienna that are active in the AAL sector.
The technology platform of Vienna Business Agency also offers an overview of Viennese technology companies.

Company	Since	Staff	Description	References	Contact	Website
AAL Austria - Innovationsplattform für intelligente Assistenz im Alltag	2012		The innovation platform AAL AUSTRIA represents a network of stakeholders in the highly interdisciplinary field of Active & Assisted Living. AAL AUSTRIA connects research organizations, commercial companies and (health) care organisations as well as public institutions to disseminate AAL relevant information and share experience among stakeholders. AAL AUSTRIA is non-profit organisation and has currently more than 80 members associated	none, AAL AUSTRIA is not a commercial organisation	AAL AUSTRIA - Innovationsplattform für intelligente Assistenz im Alltag Laudongasse 21/13 1080 Wien T: +43.664.9100205 kontakt@aal.at	www.aal.at
Alysis	2011	10	Alysis is an IT service company with focus on user experience & usability, app development, software development and user experience training, also in the field of AAL. The human-centered development process enables products and services to be designed to meet the needs and requirements of users and customers. Users, like doctors and patients are involved in the entire development process.	“COPD Help”, an app to support the everyday life of COPD patients and copdapp.at, the information portal for COPD patients of the Austrian Society of Pulmonology, “Urtikaria” App of Österreichische Lungenunion, multilingual “Urticaria” App for the Global Allergy and Asthma Patient Platform, Website development ÖLU: lungenunion.at and GAAPP: ga2p2.org Research project “Smart COPD Trainer”, the digital assistant for COPD patients	alysis GmbH Schrotzbergstraße 6/1 1020 Wien T: +43 1 9463992 office@alysis.at	www.alysis.at
Button GmbH	2012	7	Specialists for smart home solutions in the private sector (apartment, one-family house, etc.) For commercial purposes (multi-storey housing, Apartementbuildings, senior citizens / old people‘s homes, etc.)	Stix und Partner, JP Immobilien, 3SI Immogroup, Seniorenresidenz/Penthouses Hammerling	Button GmbH Sieveringer Strasse 103/1/1 1190 Wien T: +43 1 320 08 11 office@button.co.at	www.button.co.at
CareCenter Software GmbH	1999	22	CareCenter is specialized in developing software solutions for elderly care, disabled care, rehabilitation and more for over 25 years. With more than 300 installations in Austria, CareCenter is the market leader for care and documentation software. In order to continually expand the area of operations, CareCenter is working in the AAL area with research centers and national and international organizations such as IHE and is a business partner in various RD projects.		CareCenter Software GmbH Hietzinger Kai 169 1130 Wien T: +43 720 271000 office@carecenter.at	www.carecenter.at

Companies AAL

Company	Since	Staff	Description	References	Contact	Website
cogvis	2007	15	cogvis focuses on the intelligent evaluation and use of 3D data and images. Founded 10 years ago as a spin-off of the TU Vienna, the company today develops and sells highly innovative AAL (Active and Assisted Living) solutions, allowing to ease the life and increase the safety of the elderly and senior citizens. The main product is fearless - the intelligent 3D fall sensor. Additionally, we are working on further innovative workplace solutions for rehabilitation and the support of care.	fearless is the intelligent, contactless fall sensor that not only detects falls, but also helps to prevent them. The system detects when a person gets up and then automatically switches on the lights or alerts a carer. Both can greatly reduce the risk of falling. However, if a fall does occur, quick help is the most important thing: fearless automatically alerts people in the event of a fall without having to wear a sensor on the body or any activity from the fallen person.	cogvis software und consulting GmbH Wiedner Hauptstraße 17/1/3a 1040 Wien T: +43 1 236 058 0 office@cogvis.at	www.cogvis.at
echotech GmbH	2011	3	echotech specialises in highly professional IT services for small and medium-sized enterprises. Since 2011 the satisfaction of our customers is our focus. Especially smaller companies score with flexibility and efficiency - we support you in fulfilling this requirement and offer you: • Management Consulting (Cooperation Partner) • Overall IT planning - using the methods of efficient project management • Soft- and Hardware Problem Solutions • Process analysis, documentation and optimization • Sales and service of workstations, servers, network technology and peripherals		echotech GmbH Hauffgasse 15/3/1 1110 Wien T: +43 660 6654321 office@echotech.at	www.echotech.at www.custolife.eu
ilogs mobile software GmbH	2005	52	ILOGS is an ICT company which develops and distributes innovative e-health software products. ILOGS is the market leader in mobile social home care and covers with its ICT platform MOCCA ONE all areas from residential care to care of older adults at home. The company has an international footprint and has customers in Europe, USA, and Australia.	Most of our customer use the JAMES safety smartwatch. The full product with tele-care, gaming, social isolation, and entertainment is used in several regions all over Europe. Some of our existing customers are: German Red Cross (DE) proVita (DE) Hilfswerk Salzburg (AT) Medical Guardian (UK) I Care Solutions PTY LTD (AUS) ASTER Group (UK)	ilogs mobile software GmbH Krone Platz 1 9020 Klagenfurt T: +43504197 office-ims@ilogs.com	www.ilogs.com
Johanniter Österreich Ausbildung und Forschung gemeinnützige GmbH	2012	11	JohanniterAusbildung und Forschung gem. GmbH (www.johanniter.at) is part of Johanniter-Unfall-Hilfe (JUH) in Austria. In 1974 the JUH was established to provide professional emergency care and is care provider. The aims are to provide health related knowledge to the broad public as well as training and education to medical professionals in care and emergency medical services.	Johanniter in Austria were part of projects such as: My-AHA, i-evAALution, CARUcares, SOCIALCARE, AHEAD, ProFouND	Johanniter Österreich Ausbildung und Forschung gemeinnützige GmbH Ignaz-Köck Straße 22 1210 Wien +43 1 470 70 30 2222 forschung@johanniter.at	www.johanniter.at
m-smartsolutions gmbh	2016	2	m-smartsolutions offers consulting, planning and realization of smart home solutions, meeting the highest expectations regarding systems integration. Due to the fact that smart homes and AAL installations face widely the same technological requirements, the company is very active in conception, consulting and realization of assitive technologies. We are also engaged in and with lobbying and research institutions.	Numerous smart home installations offering assitive technologies and/or the possibilities to expand functionalities at the moment assitive technologies are needed, without having to change technical infrastructure of the building.	m-smartsolutions gmbh Garnisongasse 3 1090 Wien T: +43 1 535 34 75 office@m-smart.eu	www.m-smart.eu
Memocorby	2016	3	Memocorby is a E-Health company and developes digital tools for speech therapy for stroke patients, patients who suffer from dementia as well as for kids with special need to relearn and retain language. Memocorby is based on neuro-scientific research about sustainable learning.	FH Krems Musiktherapie, LogopädieAustria, Neurologisches Therapiezentrum Kapfenberg, Gerlinde Ink MSc, speech pathologist, Logopädiepraxis Kettenbrückengasse, Dr. Patrick Schöggl MD, Claudia Kölbl, speech pathologist, Logopädie Kölbl, Perchtoldsdorf.	Memocorby Systems GmbH Untere Weissgerberstraße 37/25 1030 Wien T: +43 699 15151512 office@memocorby.com	https://memocorby.com/

Companies AAL

Company	Since	Staff	Description	References	Contact	Website
Sign Time GmbH	2008	20	Sign Time translates spoken and written language into animated sign language using an avatar system. The aim is to enable accessible communication in different media. Sign Time translates websites, travel information, citizen information and patient information leaflets for medicines.	Our customers include Deutsche Bahn, Landesverband Rheinland-Pfalz und Westfalen Lippe, City of Vienna and Austrian Research Agency.	Sign Time GmbH Schottenring 33 1010 Wien T: +43 660 800 10 12 office@signtime.media	https://simax.media/
Speech Code Produktsicherheits GmbH	2012	2	The accessible information media SpeechCode turns any text into audio files via the online Speech Generator. Audio files can be presented as printed codes, NFC Tags or online Links. With the free app “speechcode” users transfer the data without any internet connection to their smartphone. The content is shown on the display and read out aloud. The accessible and easy to use app enables the use for AAL support - providing audible instructions for use, menu cards, programmes, etc.	AAL West - Show appartments in Innsbruck, Austria Hofheimer Bau GesmbH (DE) - Brochure in easy language for accessible appartments	Speech Code Produktsicherheits GmbH Frankenberggasse 13/13 1040 Wien T: +436643503455 office@speechcode.eu	www.speechcode.eu
SYNYO GmbH	2010	24	SYNYO GmbH is an independent SME with a focus on research, innovation and technology based in Vienna. SYNYO explores new methods and develops user-oriented solutions in the context of various challenges of the digital age. In the area of Ambient Assisted Living (AAL), SYNYO focuses on advising organisations on the selection and procurement of technological solutions with a strong focus on B2B and B2G. In addition to the established knowledge of the national and international AAL provider landscape and based on a structured decision-making methodology, SYNYO also hosts a comprehensive database of relevant hardware and software solutions. As a result, a fast screening and targeted assessment for selecting the best suppliers, products and services can be carried out together with the respective organisation.	TAALXONOMY: SYNYO led the creation of the classification system for AAL solutions called TAALXONOMY, which is now used by many programmes and organisations in Austria and Europe. ActiveAdvice: With ActiveAdvice, SYNYO has created a decision support system that provides a comprehensive market overview and digital consulting services to various stakeholders in the AAL ecosystem. AAL Vision 2025: SYNYO coordinated the development of the “AAL Vision 2025 for Austria” with the involvement of all stakeholders and internati-onal trends initiated by the BMVIT and the FFG.	SYNYO GmbH Otto-Bauer-Gasse 5/14 1060 Wien Austria aal@synyo.com	www.synyo.com
Tec-Innovation GmbH	2014	5	We produce the shoe called Innomake, which helps blind, visually impaired, motor-impaired and elderly personsas well as security organisations to make their daily lives easier and safer. The shoe is equipped with intelligent electronic and warns the user for steps, curbs, lanterns and other objects, except the ground itself. With the associated smartphone app, the user can individually range the dis-tance, to be warned of obstacles within the preferred distance. The warning signal can be haptic, acoustic or both.	Since July 2018 we successfully run our beta phase with the first paying customers. With their feedback we improve our product. The official launch is planned for March 2019.	Tec-Innovation GmbH Zachgasse 1 1220 Wien T: +43664 517 66 69 office@tec-innovation.com	www.tec-innovation.com
Wetouch e.U.	2010	5	We, the Wetouch Team, love to create awesome interactive experiences for people. We are having fun in touching people of every age at touch points. Making interaction as simple and intuitive as possible is our passion. Fot this to achieve, we code, we design interfaces and we engineer hardware. At our Wetouch Labs, we research and develop new solutions. For AAL R&D projects, we offer our development and engineering services. As well as our understanding of the market, since we also successfully offer commercial solutions.	We are doing R&D within AAL projects since 2010. Currently in projects “Memento - keeps my mind” (http://memento-project.eu/) and “Kith'n'Kin - technology connecting friends and family” (http://www.kithnkin.eu/). A finished project is “AALuis - Ambient Assisted Living User Interfaces” (http://www.aaluis.eu/). Current and former project partners are: AIT Austrian Institute of Technology, CURE, 50+, Hilfswerk, Philips/TP Vision, New Design University, iHomeLab Universitity of Luzern, Terz Stiftung, Medical University Vienna.	Wetouch Schellhammergase 3 /1 1170 Wien T: +43 699 18 040 040 info@wetouch.at	https://wetouch.at/

Companies AAL

Company	Since	Staff	Description	References	Contact	Website
Youtoo GmbH	2016	5	Youtoo is a web-based service application that motivates people to help relatives and close friends who are sick and/or in need of care on a voluntary basis. An innovative solution for planning and coordinating voluntary help is offered to volunteers. Voluntary help is professionalizes by providing patient-specific eContent for concrete aid measures which can be performed by laymen.	Elisabethinen, Caritas Oö–, Kreuzschwestern Europa Mitte (OMS), Bandagist Heindl, GESPAG, Vinzenz Gruppe Youtoo is a web-based application to support the coordination of help on a voluntary basis. Together with the partners mentioned above you-too will be expanded by AAL sensors (fall sensors, motion sensors, ...). Thanks to that family members of the person in need are always up to date and are able to react in case of need.	Youtoo GmbH Landstraßer Hauptstraße 4/12 1030 Wien T: +43 66488968467 hello@youtoo.help	www.youtoo.help

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