

THE SWEDISH AGETECH MARKET

Report

2023

AGING^{2.0}



Executive Summary

Today's growth in the aging population requires new methods of delivering health and social care services

This report is an initiative of Aging2.0 Sweden, which is a local chapter of the international Aging2.0 Network. Our aim is to provide an overview of the market for aging technology in Sweden, focusing on the needs of the senior population, caregivers and informal carers. We analyze the market size and value, identify key challenges and opportunities, and offer recommendations and success factors for investors and entrepreneurs interested in entering growing their business in this area.

The aging population in Sweden is growing rapidly, creating a higher demand for innovative solutions to support the elderly and their caregivers. The primary concerns for care recipients are enhancing independence, improving quality of life, and ensuring safety and well-being. There is a need for tools that can assist caregivers and informal carers in providing effective and personalized care while also reducing their workload.

Compared to other countries, the market for aging technology in Sweden is relatively small, making it challenging to estimate its monetary value. However, we make assumptions about its market value and forecast the growth rate based on the current market size. Entrepreneurs and investors face significant challenges due to care system regulations and privacy concerns.

Despite these challenges, there are promising opportunities in the market for technology enabled solutions focused on the elderly in Sweden. Technological advancements such as wearable devices and artificial intelligence present exciting possibilities. Building strong partnerships and fostering collaboration among various stakeholders can help investors and entrepreneurs position themselves in this rapidly expanding market. While we acknowledge that this report is not based on exhaustive research, we have made every effort to accurately convey the realities of the sector. We hope that this report will inspire innovators and financiers to engage in addressing the growing challenges and opportunities associated with the aging society in Sweden.

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Preface

Aging 2.0 Sweden is a Swedish branch of Aging 2.0, a global network that brings together various actors in AgeTech innovations, entrepreneurs, and investors. We aim to break down silos between stakeholders, connecting seniors, innovators, the public sector and academic institutions. Our ambition is to facilitate a better flow between the stakeholders so that we together can address the challenges and opportunities with a rapidly changing demographic situation. This change in demographics is not unique for Sweden and can be seen globally.

There is much interest in Sweden from an international perspective and therefore we have decided to issue a report about Swedish AgeTech and the welfare technology market. The main target group for the report are investors and entrepreneurs looking into the market and providing solutions but the report also aims to support Swedish innovators in establishing themselves in the market.

We want to encourage more actors to get engaged and involved in the market and contribute to a bright future for our seniors and ourselves. We look forward to receiving your feedback and thoughts about the report and this area, so please don't hesitate to get in touch with us.

Stockholm, October 2023

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Introduction

Technology as a solution to the challenges of the aging society in Sweden

In this report, we have adopted the following definition of AgeTech:

AgeTech is a growing field that can offer innovative solutions to address the challenges of the increasing elderly population and factors such as physical activity, healthy eating, social support, health promotion, mental health services, and safe housing with welfare technology supporting these activities [1]. AgeTech addresses different elderly needs and social disparities, fostering an inclusive society for seniors. AgeTech solutions include teleconsultation, emergency response system, tracking device, home safety, and security. Other AgeTech areas are mobility devices e.g. walkers, scooters, powered wheelchairs, in-car technologies such as parking assistance GPS navigation; aids for vision/hearing impairment and other assistive technologies [2].

“AgeTech is a wide range of digital technologies, products and solutions that particularly address the needs and demands of the aging population and can support the seniors to live a healthy, active and independent life”.



Aging population in Sweden



The population in Sweden is 10.53 million, growth is expected over the next decade with the estimation of 13 million by 2080 [3].

“The life expectancy at birth for men is 81 years and 84 years for women. The average life expectancy of elderly living in Sweden at age 65 is 19 years for men and 21 years for women [4].”



2,6 million people of the Swedish population, are 60 years or older [5].

2.6M

The share of elderly in the entire population in 2022 for women aged 65 years and older [6]

21.9%

The share of elderly in the entire population in 2022 for men aged 65 years and older [6]

19%

Swedish long-term care system

Sweden has a comprehensive system for long-term elderly care. The Social Services Act governs the long-term care system; the act regulates the social and financial support to help seniors live a good quality of life. The long-term care system in Sweden is decentralized and tax-funded, with health and social care for seniors being a joint responsibility for the regions and municipalities. To meet the seniors' needs, regions and municipalities must communicate and draw up care plans for the elderly when required. The regional level manages health and medical care, while long-term care for home care and residential care is handled at the municipal level. The municipality may also provide some level of health care at home.

Home-care services (*hemtjänst*) include, but are not limited to, shopping for groceries, taking a walk, home cleaning, dressing, and toileting etc., as well as social activities. Home health care services (*hemsjukvård*) cover medical care provided by a nurse. Residential care includes both home and health care services provided in a facility (*vård-och omsorgsboende* or *särskilt boende*) [7].

The Swedish long-term care system is funded by taxes levied at the local level. The municipality varies depending on the population. Therefore, the financial sustainability for managing long-term care differs [7]. After assessment of a senior's need for care by the municipality, that care can be provided by either public or private providers [8]. Assessments are usually followed up within a year and updated if necessary. Seniors in residential care are excepted from this assessment once they have moved in. The home-care services (*hemtjänst*) are offered when aid administrators (*biståndshandläggare*) make assessments to decide on the scope of home-care support the individual is entitled to.

In addition, cash benefits of two types - attendance allowance (*hemvårdsbidrag /anhörigbidrag*) and carer's allowance (*anhöriganställning*) can be provided to the senior's family carers, upon decision by the municipality[7].

The regions and municipalities finance 90% of the social and healthcare; 5% comes from federal taxes, while 4-5% comes from the elderly [7].

Market size and value



The Swedish AgeTech is a growing market that offers a variety of opportunities for entrepreneurs and investors, offering both financial advantages and social impact.

Market size

The use of technology in municipalities has increased from 29% in 2018 to 65% in 2022. More municipalities have embraced digital communication between the staff and the residents in elderly care, with a significant increase from 5% in 2018 to 56% in 2022. Other areas showing a growth in municipal use of welfare technology include digital locks in private homes, digital supervision, GPS alarms, drug dispensers, and Internet access. The breakdown of municipality size shows that large municipalities have adopted more welfare technologies than small-size municipalities [9].

Internet access for the elderly in residential homes has increased, to 60% of public residential homes, and 83% among private elderly care providers. The use of digital platforms for staff for planning and documentation has also increased. Digital supervision in the form of a camera for night surveillance has been used by 3,360 people homes in 2022 within 225 municipalities, a slight increase compared to 2021. GPS alarms have around 2,092 users in 188 municipal housing with an increase from 2021.

The use of digital locks increased from 75% in 2021 to 81% of municipalities in 2022, whereas video support for coordinating individual planning for the elderly has a low number of users. Municipalities that offer digital communication between the staff, elderly, and their relatives dropped to 47% in 2022 compared to 55% in 2021 [9].

Technology provided for the elderly in residential housing include passive alarms such as door alarms, motion detectors, and fall alarms. These send a signal to the caregiver in case of an incident. 95% of municipalities use passive alarms in residential housing for the elderly [9].

What is the market value?

Sweden is one of the leading hubs in advanced digital technologies; and ranked number one in the EU Innovative Countries ranking. The size and the number of companies in the Swedish IT sector have increased over time. The number of tech companies in Sweden grew from 50,067 in 2017 to 54,452 in 2020 while the number of companies in the software and IT services industry grew from 42,697 in 2017 to 47,110 in 2020. This indicates a significant growth in the Swedish tech industry, with the software and IT sector having the highest number of companies. In 2021, the total revenue in the Swedish tech industry was SEK 850 billion with software and IT services having the highest revenue in the technological sector [10].

The growth of the AgeTech industry depends on understanding the demand for digital technology. To be able to allocate more resources, venture capitalists need to have adequate knowledge of the opportunities within the Swedish AgeTech.

AgeTech in Sweden is still a sector in an early development stage. An increasing number of emerging innovations is not yet followed by a corresponding amount of attention. When compared to the HealthTech area, AgeTech seems to offer multiple unexplored opportunities. There are currently no reliable reports and calculations of how much the market is worth. Neither are there forecasts on future growth. Finding the numbers for the

market size and forecast are thus based on assumptions of the number of users and unit price of each type of welfare technology commonly used among the elderly.

Based on Aging2.0 Sweden's research, we estimate SEK 406,2M as the yearly market value of care alarms, SEK 20,2M for digital night surveillance cameras and SEK 11,9M GPS-alarms in 2022. Based on previous growth, a cautious forecast of a 3% growth rate per year can be assumed, predicting a market value of SEK 470,9M for care alarms, SEK 23,4M for night surveillance cameras and SEK 13,8M for night surveillance in 5 years.



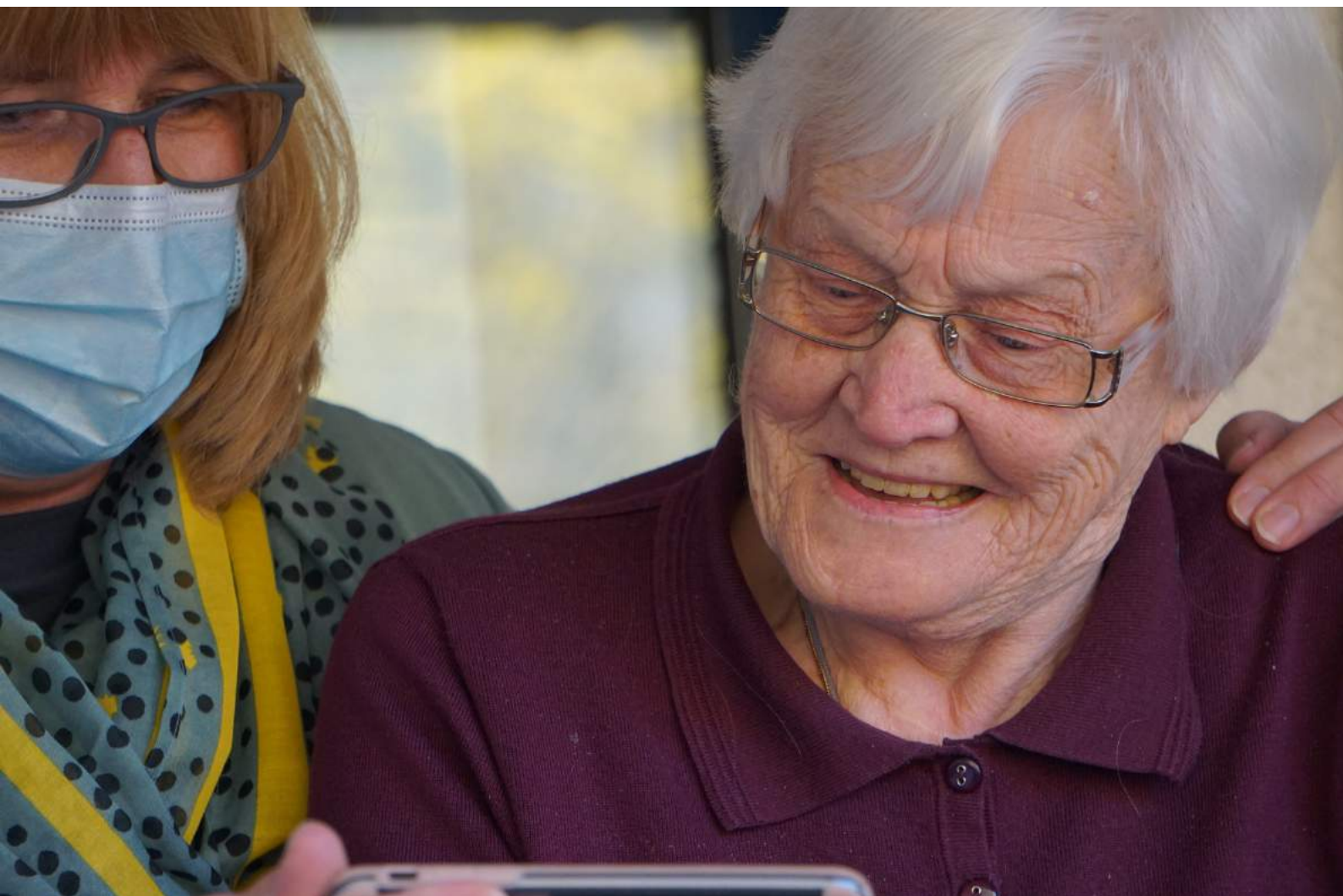
AgeTech is now an essential part of innovation networks and programs globally and nationally. For example, the European Institute of Innovation and Technology (EIT) includes promoting healthy living and active aging as one of their main goals; and Sweden's innovation agency Vinnova has promoted, supported and financed AgeTech innovation across the country. The National Board of Health and Welfare (*Socialstyrelsen*), authority in charge of welfare and social care in 2022 paid out approximately SEK 3 billion in two different installments of investments in elderly care. This was part of the performance-based investment in the sector, aimed at reducing the number of hourly workers and at increasing the number of nursing staff in residential facilities [11]. The most common services provided in elderly care in 2021 were care alarms, home help services, and special housing/residential care [12]. Currently only a small percentage of seniors actively use welfare technology the municipalities offer, which is due to varying levels of care needed and individual preferences; however, the room for improvement and wider adoption is clearly visible [13].

The AgeTech sector has already attracted multiple innovators and investors. Below are several examples of growing small and medium-sized companies within this area in Sweden that offer digital and welfare technologies that help seniors live actively and independently, and thus excludes technologies focusing on disease management and treatment.

Company name	Product description
<u>Camanio</u>	A care platform for coordinating digital services and welfare technology for elderly care; transitioning into digital care has been made easy with Camanio where you can tailor security and digital alarms in a cohesive platform.
<u>Medarca</u>	A digital all-in-one service for medication management, a digital cabinet that stores medicines and keys is now part of a digital solution for elderly care homes. In Jan 2021, Medarca received SEK9.5m in funding.
<u>Minnity</u>	A working tool and training solution for elderly care, with advanced communication functions that enable effective communication between the caregivers, the users and their family including a microlearning platform for care professionals. Minnity has received SEK1,2M funding from Vinnova between 2018 and 2020.
<u>Stunder</u>	A digital platform to combat loneliness of the elderly people in Sweden, received a contribution of SEK 966,640 from Vinnova. The project was part of the application round for solutions answering to the pandemic challenges in 2021.

Company name	Description
<u>Vevios</u>	An innovative safety alarm resembling a wearable mobile phone in a bracelet that provides communication feature. Vevios has received a total of \$379k in funding from Almi Invest and <u>Fast Track Malmö</u> .
<u>Virotea</u>	Virtual reality solutions with the aim to improve the social care and quality of life of the elderly people. Virotea uses virtual glasses to help the elders explore new worlds and have interesting experiences as well as to facilitate staff understanding of how it is to live with cognitive impairment.

More innovative companies emerging in the Swedish AgeTech sector can be found in Appendix II.



The need for innovation



The needs of the Swedish AgeTech sector are a combination of challenges faced by the elderly individuals, their relatives and care providers.

Need identification and analysis

We have used a variety of methods to better understand the needs of elderly care providers and of seniors. An interview with a manager of a municipal care unit was conducted; perspectives on the needs and challenges of the caregivers, the elderly, and care providers were shared. To understand the needs of the seniors, an online survey was sent to persons living in Sweden aged 65 years and above.

Seniors were questioned about their needs that could perhaps be addressed by technology. In total, 99 responses were received; descriptive and thematic analysis were used to analyze the survey and interview results. Additionally, documents from AllAgeHub, a testbed for welfare technology, outlining the needs of the municipalities were also examined.

Municipalities' needs

Below are listed the most common needs or challenges expressed by municipalities participating in the AllAgeHub Matcharenan in March 2023. More examples can be found on the [AllAgeHub](#) website.



Needs	Description	Solution required
Weekly/Daily planning	The routine for planning is paper-based, which causes the staff to forget and lose some vital information about the seniors' care planning for the day. A new working method for the staff weekly/daily planning is required.	To change the working routine for the staff and minimize loss of information.
Translate languages	Diverse senior backgrounds create a communication gap with staff, making it difficult to communicate.	Provide communication methods that will reduce misunderstanding between the seniors and the staff and that can adapt to the senior's native language.
Support social life	Finding contents for social activities and interaction for care recipients can be challenging, which means that care recipients may not receive enough social activity in their everyday life.	Tools to improve the everyday life of seniors with different social activities and create a better working environment for the staff.
Lack of time perception	The care recipient expresses frustration because of not being able to be independent, displaying anxiety and stress.	Increase independence and the feeling to be in control.
Musical activity	Care recipients that have passion for music, but can no longer listen due to hearing impairment and dementia, express frustration as a result of this.	Solution that will make the care recipients continue their interest in music regardless of their hearing loss.

The seniors' needs

The section describes the seniors' needs as identified in the survey. The survey was performed digitally on a non-representative group of people over 65. Its purpose was to achieve an understanding of the senior individuals' needs from their perspective. 76% of respondents were female and 23% were male. Most of the respondent were 66-69 years and the fewest were 80-85.

The respondents most pronounced need was to maintain daily physical activities: (57% of respondents). Maintaining daily tasks like housekeeping, grocery shopping, and other chores is a top priority was the second most often mentioned by the seniors.

Other needs in rank order were:

- Healthcare and wellness activities
- Social activities
- Companionship
- Safety and security
- Financial planning and saving
- Managing meals and nutrition
- Living in own accommodation
- Transport
- Managing medication
- Care support
- Meaningful work
- Swedish speaking staff
- Back injury
- Garden help

The majority of respondents claimed not to have used any technology, some respondents reported using it to manage their everyday demands and activities. The following technologies listed in order were mentioned:

- Security/GPS alarm
- Crutches
- Timer, mobile, computer/iPad, smart watch bracelet
- Voice assistant e.g Alexa, Google assistant
- Medication reminder
- Security cameras
- Hearing aid
- Stocking puller grip claw
- Walker, wheelchair, gripper
- Work chair

The caregivers' needs

The table shows the findings of the interview with a manager within the elderly care department of a suburban municipality. The manager was asked about the needs of the professional care staff who work with the elderly.

The interview transcription was used to generate the first codes, which were then compiled into established themes.

THEMES	INITAL CODES
Education	Knowledge, Well-informed, Coaching
Quality time	Reflection, Time to rest, Talk
Communication	Language
Empowerment	Safety, Independent, Stimulation, Activities, Decision.

-
- **Education:** The manager expresses that for caregivers to perform outstandingly, they must be well-informed and have a high degree of education relevant to the position. They also need more trainings giving insight that:

"[...] to [do] a good job they [the care staff] need knowledge, so [that] they are well educated and of course we need money to pay their salaries [...]"

- **Quality time:** The manager indicates lack of time as one of the caregivers' challenges, describing how the caregivers work hard, but do not have enough opportunities to rest, and to discuss with their colleagues.
- **Communication:** It is important that caregivers are able to communicate with the elderly although some have a problem with the Swedish language, which makes it difficult to communicate with the elderly. This impacts the quality of care the seniors receive.
- **Empowerment:** The manager indicates the needs of the seniors, emphasizing how the seniors would like to be independent even though they are been taking care of. They also want to be safe and do activities that let them feel excitement, as expressed in this quote:

"[the elderly] want to feel independent even if they are in the [care] home [...]. So this is [a] skill which is very important that the caregivers have: this talent to help them [the seniors] to be independent and to stay independent as long as it is possible. [It is] also [important] that the older people want to feel safe and also they want to get stimulated. That they want activities, that they can decide and are included in all decisions [...]"

In addition to the needs of the caregivers, the manager expresses how exhausting the caregiver's job is. The municipality strives to become a healthier working place. The manager's opinions on the solutions the municipality is seeking could be summed up by this statement:

"We have huge concern now to be a healthy working place and also to be an attractive working place, so that we can attract employees that want to work for the municipality [...]"

The manager's own perspective on what is to be done to meet these caregivers' needs is to first present a realistic picture of the job and demonstrate why, in her words, it is "one of the most essential jobs in the world". When asked about the technologies the municipality currently has for the elderly, the manager conveys that they have a communication tool; incontinence protection that allows them to monitor and track toileting needs, and a robot cat used to stimulate the elderly with cognitive impairment. Other technologies offered are chairs and wheelchairs with music, video tools to communicate with their relatives, and hearing aids.

A photograph of an elderly couple standing outdoors. The woman on the left is wearing a white knitted sweater and dark pants, and is smiling. The man on the right is wearing a blue button-down shirt and green corduroy pants, and is also smiling. They are holding hands. In the background, there is a brick building with a window and some purple flowers.

Stakeholders

Sweden has a tax-based decentralized system with three political and administrative levels and both public and private providers of healthcare and elderly care (“special housing” and home-based care).

National level - government and government agencies

At the national level, the government with the Ministry of Health and Social Affairs and its agencies, acts as policymakers/regulators, supervisors, and evaluators, exercising a certain level of financial control, and providing incentives in the area of health and care. The government believes in an increased use of welfare technology to maintain the quality of care for the elderly, as the need for elderly care will increase sharply in the coming years. The municipalities' uncertainty regarding the legal prerequisites for the use of welfare technology has been identified as an obstacle to the increased use.

In order to stimulate the use and counteract uncertainty, the government proposed in April

2023 regulations regarding personal integrity when using welfare technology, e.g. changes to the Act on the processing of personal data within social services to strengthen the protection of personal data; and provisions on data protection measures when using digital technology with functions that involve monitoring, sensing or positioning.

At the national level, a number of government agencies and public institutions are responsible for various aspects of welfare technology used in elderly and health care. The table below lists some of the government agencies relevant for this area (title in Swedish).

	Agency name	Mission
1.	<u>Folkhälsomyndigheten</u>	The Swedish Public Health Agency provides knowledge for public health, to prevent illness and promote health.
2.	<u>Statens beredning för medicinsk och social utvärdering</u>	The Swedish Agency for Health Technology Assessment and Assessment of Social Services is tasked with making independent evaluations of methods and efforts in health and medical care.
3.	<u>Forskningsrådet för hälsa, arbetsliv och välfärd, FORTE</u>	The Swedish research council for health, working life and welfare.
4.	<u>Socialstyrelsen</u>	The National Board of Health and Welfare works to ensure good health, social welfare and high-quality health and social care.
5.	<u>eHälsomyndigheten</u>	The Swedish eHealth agency works to digitize and improve the sharing of information between patients, the healthcare system and pharmacies in Sweden.

Agency name	Mission
6. <u>Tandvårds- och läkemedelsförmånsverket</u>	The authority that decides which medicines and consumables are to be included in the pharmaceutical benefits.
7. <u>Myndigheten för digital förvaltning (DIGG)</u>	The Agency for Digital Government supports the digitalization of public administration and is responsible for Sweden's digital infrastructure.
8. <u>Läkemedelsverket</u>	The Medical Products Agency is responsible for regulation and surveillance of the development, manufacturing and sale of pharmaceutical products.
9. <u>Post och Telestyrelsen</u>	The Swedish Post and Telecom Authority monitors the electronic communications and postal sectors in Sweden.
10. <u>Inspektionen för vård och omsorg</u>	The Health and Social Care Inspectorate is responsible for supervision and control over healthcare as well as social services.
11. <u>Upphandlingsmyndigheten</u>	The National Agency for Public Procurement provides support and guidance in state aid and public procurement.
12. <u>Myndigheten för Delaktighet</u>	The Swedish Agency for Participation works with the implementation of disability policy.
13. <u>Myndigheten för vård- och omsorgsanalys</u>	The Swedish Agency for Health and Care Services Analysis the authority follows up and analyzes health and social care services from the patients' perspective.
14. <u>Integritetsskyddsmyndigheten</u>	The Swedish Authority for Privacy Protection is tasked with protecting the individual's privacy in the information society without unnecessarily preventing or complicating the use of new technology.

The responsibility for providing healthcare and social care is delegated to regions and municipal governments. A region and a municipality must cooperate so that an individual receives the care and treatment, aids, and consumables that his or her condition requires. The Swedish Association of Local Authorities and Regions (SALAR) is an employers' organization and an organization that supports, represents, and advocates local government in Sweden. All regions and municipalities are members of SALAR.

Regions

The responsibility for providing healthcare is divided into 21 regions. Swedish policy states that every region must provide its residents with good-quality health and medical care, and work to promote good health for the entire population. A region may hand over responsibility to a municipality for healthcare in the home (home healthcare/*hemsjukvård*) through a local agreement and accept interventions by doctors, which are always a regional responsibility. An individual's care should be person-centric, coordinated, and continuous, even if responsibility is shared between a region and a municipality.



Municipalities

There are 290 municipalities in Sweden responsible for a large proportion of local services, including elderly care, schools, emergency services, and physical planning; important areas are social care and services, housing, and home-based care for the elderly and disabled, and it includes welfare technology and eHealth.

Some municipalities can be small in terms of population while quite large in terms of the geographical area covered. SALAR also offers support and guidance when it comes to introducing welfare technologies e.g. on a suitable process to follow before, during, and after a decision to introduce a new technology. Ten inspirational model municipalities for the digitization of elderly care were assigned in 2020 to drive digitization projects, gain experiences that can be shared throughout Sweden, and support other municipalities in their digitization of various services. Below you can find some concrete examples from these municipalities.

- [Borås](#) inspires a new way of thinking that leads to greater independence for seniors, promotes health and addresses digital exclusion.
- [Eskilstuna](#) has a unit for creating and supporting installation, administration and training efforts for implementing welfare technology and digital working methods.
- [Grästorps](#) makes digital tools and welfare technology easier and safer to use, for citizens, care recipients and staff.
- [Kalmar](#) wants to improve operations and quality of care through the use of e-health and welfare technology, e.g. by testing sensors for fall detection and dispensing robots.

- Karlstad's operational unit teams aim to bring experience from care recipients and existing technology solutions, to propose new smart and safe solutions for the elderly.
- Kramfors has introduced new working methods in elderly care, including welfare technology tools, to create a meaningful everyday life for the elderly, e.g. products that stimulate sensory and physical activation.
- In Lund, both the individual and the municipality should benefit from digitization, so some decision-making has also been automated and using a "digital first" strategy.
- Skellefteå municipality has created a learning center for employees, students and interns, to inspire and increase confidence in handling welfare technology, e.g. medical aids, VR equipment, and simulation.
- Uddevalla sees that welfare technology in elderly care can increase patient safety and security, reduce social isolation, stimulate activity and save time; e.g. digital keys, digital night surveillance, digital analysis of incontinence protection, fall detection radar and a chatbot.
- In Övertorneå, digital welfare technology is seen as a way to bridge the municipality's challenges with an aging population and staff shortages.



Structures within regions and municipalities to introduce innovation in elderly care

Usually each municipality and region have groups and individuals who are responsible for developing new methods of working, digitization projects and project managers. They can have titles as "*Metodutvecklare, Digitaliseringsansvariga*" etc. A few municipalities and other actors, such as Ikano Bostad, and HSB Living Lab have test beds or living labs for elderly housing and for innovations (products, services and or methods).

The Swedish Association of Local Authorities and Regions (SALAR) supports municipalities deciding on and introducing new welfare technologies based on successful examples such as from the municipalities previously mentioned. It's important to know that these are just recommendations, and each municipality and region are not restricted in any way. However, these recommendations offer insights into the basis for the decision to introduce welfare technologies and can thus be useful for technology providers when developing the value proposition. More information is available at SKR.

When the decision is taken to introduce a new technology and make a procurement plan, SALAR recommends strategic analyses, market analysis based on the needs assessment should be made to map which suppliers, products and services are available, and understand the best design requirements that balances the needs and existing market, and to choose the right procurement procedure.

Municipalities are also recommended to learn from previous procurements in other places and to consider joint procurement. As welfare technology solutions are changeable and sometimes complex, the choice of procurement procedure is particularly important, and a negotiated procedure, competitive dialogue or innovation procurement are some suggestions. Municipalities can get support from the [National Agency](#) for Public Procurement, which also offers guidance to potential suppliers. SALAR also provides a [checklist](#) for quality assurance of the procurement documents.

Customers for innovation in elderly care

In Sweden, most assistive devices are funded by the public sector, either granted based on a needs assessment by the municipal social services office or prescribed by a health care professional, as a loan or at a significantly subsidized cost. There are roles in the municipalities responsible for operations development and may have titles such as “*Digitaliseringsansvarig*” (responsible for digitalization) or “*Verksamhetsutvecklare*” (operations developer) or similar. Some assistive devices and tools can be prescribed through *Hjälpmedelcentralerna* (the region’s assistive technology centers). The list of approved products may vary. However, there is one *Hjälpmedelcentral* per region and sometimes also municipal *hjälpmedelcentraler*. For example, the Gothenburg region, [Västra Götalands](#) region and Västkom collaborate between [48 municipalities](#) in the Gothenburg region.

Private individuals such as seniors and relatives are also customers of AgeTech innovations. In those instances, assistive devices are usually bought through physical shops specializing in assistive devices and aids (*hjälpmedelsbutiker*), online, or through an app store. Today the market is small, except for assistive devices, which are partly purchased privately, the seniors aged 75 and above major spending market are apartments or assisted living facilities (*ygghetsboende*), for elderly people who are too healthy for nursing homes but want more security and social companionship than they can get in their current homes. The extra services provided often include welfare technologies. Swedish seniors also buy apartments in the Mediterranean area which is seen as an opportunity.

Financing options

The municipalities are the main principal investing in elderly care innovation. However, other financing options apart from sales are possible and if reimbursement models are missing, private care might have other incentives to introduce new technology than public providers such as Vinnova, EU-project, ALMI, Out-of-pocket, Insurance alternatives - health impact bonds e.t.c. There are also extensive academic research groups focusing on research within innovation of elderly care, aging, and welfare technology; these institutions include; [KTH](#) Royal Institute of technology, Örebro University, Lund University and Gothenburg University. See Appendix II for more research groups and their research areas.



Challenges and Opportunities

Digital technologies are used across various industries in Sweden. While the population has a high degree of digital literacy, the elderly care providers face challenges in wide adoption of technology.

Challenges

According to the Board of National Health and Welfare [9], access to welfare technology is unevenly distributed among the municipality residents in the country. The seniors' access to welfare technology depends on the municipality where they live and their contribution. Although some welfare technologies have been introduced, many municipalities report that only a few people are equipped with such technology. Digital technologies are used in nearly every part of Swedish life; older individuals who lack the knowledge or technical skills are shut out of many activities. As a result, some of the older people living in Sweden are unable to benefit from these technologies. It would be difficult for seniors who are digitally excluded to adopt welfare technologies since they typically have little interest in the internet or other digital technology.

The survey's implied question, "Would seniors be interested in seeing and purchasing technologies that meet their daily needs?" received 46% unfavorable responses, 43% uncertain responses, and 10% positive responses.

In Sweden, the level of priority given to providing senior residents with digital help varies between municipalities, although there are National policies that state that older people risk early digital exclusion, the impression of the digital gap appears to be more private than public. Many older people in Sweden need digital help but lack adequate public support and information [14]. Other shortcomings faced in the Swedish municipality elderly care include:

Staff shortage: Many municipalities have for some time had recruitment challenges for elderly long-term care. There is a need for more employees in that area now and in coming years. Time-limited employment and staff working part-time are common among staff in elderly care. Moreover, finding the right skills to complement the staff shortage situation is challenging [15].

Quality: The care system is demanding as sometimes the seniors are not cared for by the same caregiver. Seniors who receive home care saw 16 caregivers in the space of 14 days in 2019 and in 2021 the figure is about the same. There are no data on support available for the caregivers [7].

Financial constraints & work attractiveness: Municipalities underlined that the shortage of certified workers and limited finances available to cover wage requirements were contributing factors. Municipalities believe they need to make municipal health care more desirable, while state grants are crucial for providing skill development and educational services [11].

"In the next ten years, the need for personnel will be the greatest in elderly care. Due to the population growth alone, the need for employees will increase by 31 percent until 2031, which means that 186,000 employees who are employed today need to increase to 245,000 employees in elderly care in the next ten years" - Caroline Olsson (SKR) [15].

Municipality health and health care: There is a major shortcoming in the regions' medical services and care for those living in special senior housing. One crucial challenge for municipal healthcare operations is the availability of medical competence. According to the IVO (Health and Social Care Inspectorate) report, one fifth of the residents living in the audited care homes had not received an individual medical assessment [4].

Absent due to illness: The staff in elderly care reported to have the highest rate of sickness compared to other assistant nurses in care. The statistics show that sickness absence is highest among assistant nurses in nursing homes and home care [4].

Challenges from an entrepreneurial perspective

Challenges entrepreneurs face in today's dynamic business environment cannot be overlooked; by recognizing and overcoming these challenges, aspiring business owners looking into the social care sector may increase their chances of success and create successful growth strategies. We present the challenges faced by entrepreneurs currently operating in this sector.

The market is immature: The digitalization of the public sector is very slow and the social care sector is one of the last industries to become digital. Many digital solutions in social care are either based on a patient-centric, relative-centric or sometimes a nurse-centric view and the perspective of the senior citizens is often missing.

Entrepreneurs want to promote both old and new innovative technology: The challenge is how to fit into a new way of working; it is challenging to promote innovation in social care and to successfully to implement it at scale. Pilot testing is relatively easy, as well as small-scale tests, but a wide-scale implementation is challenging.

The reimbursement structure is devised for healthcare: Healthcare is funded for each care visit or intervention, e.g. a performed procedure. However, the value of social and welfare care is much harder to measure. This is also due to many of the care tasks being traditionally performed by family members (informal carers). The social care system is an multifaceted, complex process involving the entirety of personal life. As a result, estimating the market value of social and welfare technologies is challenging. The current reimbursement practices also result in the need to innovate also with regards to the business and payment models.

Lack of standards for integration and system interoperability: As per customers' request, digital solutions often need to be integrated or interoperable. However, Sweden is nowadays missing standards for such processes. Some initiatives are emerging, e.g. from [Tech Sverige](#), to facilitate integration and usability of the digital solutions.

Opportunities

What processes exist to facilitate innovation in care?

The growing awareness of the challenges the aging society brings in Sweden is the one largest opportunity in the market. Not only does the number of people over 65 increase rapidly, but their voices and needs are stronger in the public debate. The obvious lack of care personnel, especially professionals with adequate knowledge, makes it obvious that the sector needs solutions that are out-of-the-box, and multiple analyses and recommendations highlight the need to involve technology in the equation.

Most often, technological innovation is judged by how much time it saves the care personnel, or how much longer it allows the senior to stay independent and self-sufficient, so that care services are not required. Some go as far as to say that time is the new currency in Swedish elderly care.

A growing number of public bodies include digitalization in their prioritized actions and projects, and noticeable effort is being put into allowing for cross-sectoral collaboration to facilitate these processes. However, unlike medical devices such as MDR, there are no guidelines or regulations for software and devices used solely for social care. This can be considered both an opportunity to develop new solutions but also a threat as regulations and guidelines might also work as incentives. Increased attention is given to prevention as an area of potential wins, but most of the incentives are focused on fighting already present diseases or disabilities, not preventing them. The reimbursement for care is based on the severity of disability and/or illness.

There are examples of prevention-focused projects, such as [Health Integrator](#), a digital service for those who are at risk of chronic diseases or who experience mental illness. The service helps individuals make sustainable lifestyle changes with the support of a health coach who provides tools to reach set goals. On behalf of region Stockholm, Health Integrator offers 925 people an opportunity to participate in a 5-year program. Already after 18 months, positive results are visible, with over 60 percent of participants improving their blood values and 45 percent having left the risk zone for type 2 diabetes. It needs to be mentioned that the program is not specifically targeted at the elderly population, but shows inspiring change of a focus shift from treating the disease to preventing it.



Analysis of existing support projects

There is a growing number of projects and transversal collaborations that facilitate innovation in Sweden. Examples of such projects include:

- **AllAgeHub**, a common initiative of the Gothenburg municipalities, aims to match the needs of care facilities and citizens with innovative solutions. In collaboration with actors from academia, civil society, business and the public sector, AllAgeHub develops a user-driven test bed, with the aim of stimulating the use of welfare technology that meets the real needs of users.
 - **Care innovators**. The city of Helsingborg had care assistants employed half-time as care innovators to scout for innovations and improvements. With different backgrounds and education, their common driving force was the desire to create change and find new solutions. The innovators job has been to create real solutions that can be tested together with residents and care staff as well as listen in and make use of the ideas and suggestions that staff and residents have, but which do not go forward.
 - **Digital Well Demand Accelerator**. Digital Well Arena, a collaboration between commercial companies (Compare, CGI, Xmentor Management, Nordic Medtest, Tieto), Karlstad municipality, Värmland region, RISE Service Labs and Sweden's innovation agency Vinnova, aims at developing digital solutions that increase the citizen's ability to live a healthier life
- Demand Acceleration is a methodology for how the public sector can drive innovation and change with public procurement as a tool, by increasing the demand for sustainable solutions. The model includes co-creation and support in commercialization of the solutions, which makes it unique in Sweden.
 - **Stockholm Digital Care**. Between 2015 and 2020, this project aimed to create growth for small and medium-sized companies in the Stockholm region that work with welfare technology. The collaboration between municipalities (Stockholm, Huddinge, Nacka), the Stockholm region and RISE have led to the creation of test environments within care facilities. The project allowed to, among others, clarify companies' needs early on, create a space for dialogue between the needs owners and technology providers and provide opportunities for learning between test environments.
 - **Glesbygdsmedicinskt centrum**. The Centre for Rural Medicine, GMC, is a unit within Region Västerbotten that conducts research, development and education for and in sparsely populated areas.



The areas of focus are good and close care in sparsely populated areas, Sami health, and recruitment and education. Multiple research and innovation projects carried out by the center include remote health monitoring, care and therapy as well as prevention. The insights from the projects can in the future also be used to tackle the challenges in more populated areas as well.

- **Research Institutes of Sweden (RISE)** is an independent, state-owned research institute that is particularly engaged in the development and testing of innovative solutions across different sectors, including the aging society. An example of a cross-sectoral project is Levande berättelser (Live stories), an initiative financed by Kamprad Stiftelsen, and delivered by Betaniastiftelsen,

Agning 2.0, Piteå kommun, Socialförvaltningen, Minnity, Kalix Visningsrum, focuses on developing accessible and interactive methods to bring stories to life for older people, staff, and relatives. The aim is to prioritize the well-being of the elderly, their social interactions, and the ability to express their identity. The project specifically focuses on life stories, which encompass a person's history, preferences, and habits, serving as a tool for person-centered care. The project's goal is to create multisensory interactive life stories that convey identity, create meaningful experiences, aid staff in their daily work, and promote active participation in one's care and social context. The developed concepts will be prototyped, tested, and evaluated by users in real-life settings, including nursing homes and the homes of elderly individuals and their relatives.



Recommendations



Establishing robust partnerships and promoting collaboration among diverse stakeholders can enable investors and entrepreneurs to position themselves effectively in the swiftly growing AgeTech market in Sweden.

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- More in-depth research into the market value and financial requirements of AgeTech in Sweden is needed.
 - Cross-sectoral collaboration should be developed and enhanced, based on current projects, to inspire collaboration with needs owners, regulators and solution providers.
 - The Swedish society is perceived as digitally mature, and both the needs owners, service providers as well as regulators are open to technological innovation, but entrepreneurs should not forget that user friendliness and adaptability of the solution to the local context is a must for a successful implementation.
 - Special measures should be undertaken to assist innovators in overcoming “the pilot trap”, i.e. the difficulty in implementing successfully tested solutions in the broader implementation context.
 - When engaging with the AgeTech market, both the entrepreneurs and the investors benefit from maintaining a long-term perspective as a large part of the market relies on the local government. Innovation in this area, although it is in demand, may take longer than in other sectors, but often bears fruit both in the volume of customers and the social impact of the solutions.
 - Due to staff shortage of recruitment, technology should enable a more adapted and effective the way of working. Time and resource optimization is key to effective uptake of innovation as it's strongly connected to purchasing incentives.

Success factors for an entrepreneur

From an entrepreneurial perspective, the AgeTech sector is a challenging field with a potential for ventures with significant social impact.

Due to the large volumes of potential sales and a rapid development of the aging population, there are opportunities for companies that find the right product-market fit. A cost-effective business model is usually one with recurring income as subscription and licensing models are a common practice.

In the development phase, it is crucial to work closely with customers in order to design products that are easy to use and implement. Co-creation and collaboration is increasingly popular in Swedish AgeTech and improves the chances of successful commercialization. Being able to build relationships with different stakeholders allows to adjust the product and business model as well as to seize opportunities resulting from synergies between different actors.

It is also essential to understand the complexity of the market, especially purchasing procedures and processes as well as the competitive landscape. This may be a challenge due to the fragmentation of the market, but also an opportunity as there is no specific model of fostering innovation which would bind the stakeholders.

In Sweden, the availability and quality of customer services is also highly valued. Innovators should also consider that many users and customers are not digitally fluent and might need guidance in adopting technology.

An advantage of the social care market lies in its inherent flexibility, which provides opportunities for entrepreneurs and innovators to achieve success and drive remarkable innovations. Unlike the healthcare sector, social care is characterized by fewer restrictions, allowing individuals to explore a wider range of possibilities. In healthcare, the presence of tests and trials can often lead to exhaustion before achieving a breakthrough innovation. Moreover, the pace of innovation in healthcare is hindered by lengthy processes required to bring innovations to market.

In contrast, the social care sector fosters a fertile ground for numerous innovations, as the barriers to entry are comparatively lower. Furthermore, it is advantageous to conduct initial pilot-testing with successful customers, obtain feedback, establish key performance indicators (KPIs), identify successful changes in working methods, and demonstrate tangible outcomes. This approach enables entrepreneurs to offer concrete solutions that effectively address the needs of their customers and drive improvements in their operations.



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Appendix I

Innovative AgeTech startups in Sweden

In the table below, we have gathered innovative startups, small and mid-size companies developing innovative technological solutions for the aging population. The list is not exhaustive. Click on the logo to be taken to the company's website.

Need area	Swedish companies	International companies
Security and safety	 Camanio  Cenvigo  Cloudberry CARE	 Suvanto  dele  sensio
	 COBS  minifinder  NEXT STEP DYNAMICS <small>Empowering Healthy Aging</small>	
	 MEDARCA  neki  Salus mea  Sensapp	
Communication	 Safe Base  SENSOREM  SWEDLOCK  posifon  VEVIOS	 No Isolation
	 amibotic  Call Knut  cuviva  DigiCare  doro  heedy  JOCCE  Bryr  loopeli  Minnity	
Mobility	 ActiLeg	 motiview
Social interaction	 DAGNY  LYCKNA  Music Doll SWEDEN	 Gubbe  vilMer
	 Stunder  virotea	
Housing	 BeLiving  VILLA NEST	 SILVERSTUND
Caregivers and care providers	 appva  Avanto Care  Levly	 SEKOIA
	 Bellman & Symfon  ErgoNova  E-DROP	
Activity and independence	 funktionsverket  mdv v�lf�rdsteknik  d�s�	 evondos
	 moveum  moxiam  omsorgsportalen  RoboticsCare	

Appendix II

Research environments within AgeTech

Academic institution	Research areas within AgeTech and welfare technology
<u>Linnaeus University</u>	Technology to enhance the condition for the elderly and people with disabilities
<u>ReAction group</u> <u>Linnéuniversitetet</u>	Resilience and patient activation in health care. How digital tools and video feedback can motivate and stimulate exercise of physical functional ability at home among older people. How home monitoring can be used in home health care and make frail people and relatives involved and active in their care and self-care.
<u>Aging Research Network</u> <u>Jönköping University</u>	Areas of research are in aging and later life from a broad perspective with applied research including the role of informal care, and older people's participation and influence in eldercare.
<u>The care research group</u> <u>(Stockholm university)</u>	Research interests include working conditions in elderly care and disabilities services, informal care, person-centered care, care of older people.
<u>Previve group</u> <u>(Mälardalen University)</u>	Focus on generating evidence for the effectiveness of health and welfare technology interventions in the real world, participating in co-creation of tools and knowledge with relevant stakeholders.
<u>Division of Health Informatics and Logistics</u> <u>(KTH Royal Institute of Technology)</u>	The Technology in Health Care unit aims to create working and sustainable systems that promote healthy development and meaningful lives.

Appendix III

Brief: Support to develop AgeTech on EU level

Silas Olsson, HealthAccess, Sweden

Different phases of development of AgeTech, as well as for many other applications, are often overlapping in time and technology use. Such phases may be identified as:

1. Very early research, curiosity level
2. Applied research, need based research and development
3. New technologies offer new solutions
4. Close-to-market research, development, innovation
5. Prepare for market introduction, market studies, regulatory aspects
6. Market entry

Development phases need different sorts of financing, from "seed money" to substantial investments. The phases 4-6 are assumed to be of most interest to the majority of investors and venture capitalists,

On EU level, the European Commission (EC), supported by the EU Member States (the Council) and the European Parliament, has been supporting knowledge creation in the field of demographic aging since about the millennium shift. This has resulted in many EU related initiatives, programmes and policies. Currently, the EU programs that provide support for the development of AgeTech products, services, and systems through financial co-funding of projects in a call for proposals procedure mainly include the following::

- [Horizon Europe](#) – the EU Framework programme for R&D
- [EIT Health](#) – focus on innovation
- [EU4Health](#) – the EU programme focusing on public health issues
- [AAL](#) - Active Assisted Living (initially Ambient Assisted Living)

[Horizon Europe](#) is the largest research and innovation program of the EU, with a budget of EUR 95.5 billion over a span of seven years (2021-2027). Partners from Member States and associated countries have the opportunity to participate, while countries outside of Europe may also join with specific regulations for financial project support from the EU. Presently, the Horizon Europe Work Programme for Health, 2023-2024, includes various calls/topics that address demographic aging.

[EIT Health](#) – the health branch of the European Institute of Technology primarily functions as an innovation program, collaborating with approximately 130 EIT Health Partners, including businesses, industry, research and innovation organizations, educational institutions, and healthcare delivery organizations. Project proposals are solicited through calls that cover a range of areas, including "from scientists to innovators," "transdisciplinary approach to biomedical engineering," "acceleration of reimbursement of digital health apps in Europe," and other topics related to the smart and healthy aging domain.

The [EU4Health](#) program, which emphasizes public health matters, has a budget of EUR 5.3 billion for the period of seven years (2021-2027). This budget is significantly larger than its previous program, the "EU Health Programme," indicating that public health has become a priority for the EU. The substantial increase in budget for public health can be attributed, in part, to the ongoing Covid-19 pandemic situation.

Priorities in the EU4Health programme include:

1. **Improve and foster health**, including e.g. health promotion and disease prevention, in particular cancer. International health initiatives and cooperation.
2. **Protect people**, including e.g. prevention, preparedness and response to cross-border health threats. Complementing national stockpiling of essential crisis-relevant products.
3. **Access to medicinal products, medical devices and crisis-relevant products**, e.g. ensuring that these products are accessible, available and affordable.
4. **Strengthen health systems**, including e.g. reinforcing health data, digital tools and services, digital transformation of healthcare. Enhancing access to healthcare. Integrated work among national health systems.

AgeTech seems to fit in very well in the above fourth priority. Associated countries outside EU to the EU4Health programme include Norway, Iceland, Ukraine and Moldova.

The AAL - Active Assisted Living programme was initiated in 2008 as a Joint Programme (EU Art. 185) between a majority of EU Member States and European Commission (and co-funded by EU). The AAL2 was running 2014-2020. There will not be an AAL3, so the current operating period 2021-2027 will be used to finalise on-going projects and close the AAL Joint Programme. During the years, AAL has funded about 300 projects in the context of "close-to-the-market" (2-3 years) to create better quality of life for older people and to strengthen industrial opportunities in

the field of healthy aging. Information and Communication Technologies (ICT) are used in AAL projects as enabling technology. It might be of interest to screen through AAL projects as the AAL programme is very much matching the context of supporting development of AgeTech products and services.

In addition to the above-mentioned EU programmes, there are other EU initiatives where support of AgeTech may be possible. As an example, the EU Digital Europe Programme (DIGITAL) with its "European Digital Innovation Hubs (EDIHs)" will support digital applications in different domains, including health related applications.

The above-mentioned EU programmes for research, development and innovations usually releases new "Work programmes" on a yearly basis. It may be recommended to read those Work programmes and look for funding possibilities for AgeTech products and services. Do not forget that AgeTech may be an integral part of a (larger) system or a part of a policy initiative and therefor, In a broader perspective, the mentioned EU programmes may offer possibilities for AgeTech project funding.

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