

Interreg BSR OSIRIS

PROJECT PERIOD 1

GA 2.1 THE SILVER ECONOMY MARKET: DIMENSION, POTENTIAL, STRUCTURE AND BARRIERS IN THE BALTIC SEA REGION

TRANSNATIONAL MARKET REPORT

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Finland

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1. Background

a) About the Osiris project and how the analyses will contribute to the project

According to EU statistics if ranked among sovereign nations, the European Silver Economy (the economy of the population over 50) would currently be the third largest economy in the world, behind only the USA and China. And it will only continue to grow. A recent European Commission study conducted by Technopolis and Oxford Economics describes us of this opportunity, explores its concrete economic potential and lays out steps how to capture it fully. One should also keep in mind that silver economy members have particular needs, which will evolve with the current rapid rate of technological and demographic change. (<https://www.activeadvice.eu/news/market-insights/the-eu-silver-economy-market-size-challenges-and-opportunities/2.12.2019>).

The Osiris project aims to respond to the challenges of meeting the needs of ageing populations that the governments of the Baltic Sea countries are currently facing. In addition, increased life expectancy deepens concerns about the adequate supply of essential services. By strengthening all economic activities relevant to the needs of older adults, Osiris will address the region's societal challenges.

The project targets also enhance Silver Economy growth opportunities by improving the capacity of innovation actors to apply smart specialisation approaches. For instance, it seeks to boost market uptake and scaling of use-drive technology innovations that accommodate age-specific needs and preferences and demonstrate a significant impact on the quality of life of the ageing population, including age-friendly living environments, health, safety, and leisure.

To building a new Open Innovation Ecosystem to enhance innovation in the silver economy, **the first step is bringing the actors together, obtain information about the present situation and map new ideas for possible development directions.** In the OSIRIS project, partners with their associate partners from six Baltic region countries organised co-creation workshops, using the Entrepreneurial Discovery Process method. (<https://www.osiris-smartsilvereconomy.eu/mapping-analysis-report/> 20 June 2019)

The aim of the OSIRIS is to design an innovative cooperation model in the project region. In each participating country, OSIRIS partners will design and pilot an innovation ecosystem model – a **Smart Silver Lab**. This model connects researchers, product developers, financiers and user organisations into a network. **It enables all innovation actors to screen and accelerate the uptake of innovative products and services which enable older adults to continue living a comfortable, independent and active life.**

The virtual collaborative platform – **Digital Silver Hub** – will integrate six regional Silver Labs to support transnational cooperation, learning and knowledge diffusion in the Silver Economy market and further ensure exchange of new knowledge and business schemes across the borders. (<https://projects.interreg-baltic.eu/projects/osiris-188.html> 2 December 2019)

This consortium consists of **13 direct partners and eight associated partners from Latvia, Lithuania, Estonia, Denmark, Russia and Finland** representing the business, government and academic actors of the Triple Helix model for economic growth and regional development. Among the direct partners, six public universities represent the academia helix actors, two private companies and three business support organisations correspond to the business helix actors and one local authority and one public innovation agency are the government helix actors.

Project partners

- Häme University of Applied Sciences (Finland)
- Riihimäki Business Development Co. (Finland)
- Klaipėda State University of Applied Sciences (Lithuania)
- JSC Iamus Innovations (Lithuania)
- Lithuanian Innovation Centre (Lithuania)
- Riga Technical University (Latvia)
- CONNECT (Latvia)
- Tallinn University of Technology (Estonia)
- EnLife OÜ (Estonia)
- Center for Assisted Living Technology, Health and Care, Aarhus Municipality (Denmark)
- VIA University College (Denmark)
- Saint Petersburg National Research University of Information Technology, Mechanics and Optics (ITMO University) (Russia)
- Open Joint-Stock Company “Technopark of Saint-Petersburg” (Russia)

The Associated Organisations of the project

- The Regional Council of Häme (Finland)
- Federation of Finnish Enterprises in Häme (Finland)
- Upgraded – Health Start up Association of Finland (Finland)
- Forssa Business Development Ltd (Finland)
- Region Midtjylland (Denmark)
- Medtech Innovation Consortium – MTIC (Denmark)
- Ministry of Economic of the Republic of Latvia (Latvia)
- Agency For Science, Innovation and Technology (Lithuania)
- (<https://www.hamk.fi/projects/osiris-bsr/?lang=en>2.12.2019).

b) The purpose of the analysis

Although the silver economy will become increasingly important to the EU's development over the next 30 years, we still know relatively little about it. The common questions presented in all EU countries are, for example, what is the size of the European Silver Economy?

(<http://www.smart.silvereconomy.eu>) What role should it play in Europe's economic growth? How can policy makers enable and support new products and services that will improve the quality of life of older adults? What are the actual needs and desires of the end users? What are the barriers and possibilities for all the related stakeholders?

The silver economy opens up new areas for economic growth and employment as technological innovation enters the marketplace. Demographic change also poses a major challenge to the European economy's current ways of doing business. **When understanding the risks and possibilities, it is easier to launch a proper silver economy strategy in the EU as well as on national and regional levels.** Managing the impact of an ageing population, responding to societal challenges, and boosting jobs and economic growth. The specific needs of Europe's older adults will lead to increased public and consumer expenditure. This will have a significant pull-effect on many existing or emerging markets – benefiting the ageing population and the economy at large.

This report is a summary of six market surveys carried out in Denmark, Estonia, Finland, Latvia, Lithuania and Russia last summer. The surveys are part of the international OSIRIS project, which aims to strengthen and expand innovation activity so that it corresponds to the special needs of an ageing population and solves regional challenges.

A summary of all the reports was made by **Riihimäki Business Development Company, which is located in Riihimäki, Finland.** Riihimäki is a dynamic, growing town in Southern Finland, with excellent transport links on the Helsinki–Tampere axis. Journeys within the town are short and services are close at hand. There are numerous rail and road connections available to take you quickly in any direction. Riihimäki has efficient basic services and an active business policy. Excellent educational services from preschool to polytechnic level offer learning opportunities for people of all ages. The town also invests heavily in new enterprises and in the development of existing companies. The cornerstones of the town's activity are good quality, cost-efficiency and flexibility. The field of robotics is one of the strategic cornerstones of Riihimäki. (<https://www.riihimaki.fi/riihimaki-english/>)

The market reports examine opportunities and challenges as well as strengths and weaknesses in the market for assisted living technology, the size of the market, the needs of the users, and how different actors can access essential knowledge.

Respondents from different groups suggest improvements and solutions that can strengthen the welfare technology landscape from their perspective. The idea is to define the market as the companies, the knowledge and network organisations and the users of assisted living technology (senior residents and care givers). (Market Survey, Denmark 2019)

According to the Danish market survey report, the average age of the population is on the rise. This can lead to a smaller workforce and more people needing healthcare services, which may in turn potentially cause a significant shortage of healthcare workers. Several respondents in our study mention this complexity as a significant challenge that both caregivers, technology and citizens face. This market analysis primarily focuses on the ways in which more welfare technology solutions can be used to benefit citizens. It does so base on the notion that technology has the possibility to enhance quality and safety, and that it can help minimise the serious consequences that arise from a significant shortage of healthcare workers.

Silver economy market studies are intermediary outputs that will evidence concrete gaps, regional/local barriers and opportunities, market dimension, customer segmentation, product and services gaps, capabilities and skills, price sensitivity, end-user needs, competitive advantages, market evolution forecasts; business environment needs and exploitation status.

Silver economy market studies as project output will comply with open-access principles, meaning that large public will have access to it. Output will be published on project website with free and open access.

2. Stakeholder analysis

a) Who is going to use the analysis and how?

Data obtained will be essential for designing and modelling the Smart Silver Framework components for RIS 3 implementation and valorisation of research knowledge especially through the knowledge transformation process. This output has an important transnational value because it will be one of the main data sources that will feed the entrepreneurial discovery process as well as the Joint Action Plan for exploiting silver economy opportunities in the Baltic Sea region.

RIS3 authorities will use this output for reviewing the smart specialisation priorities as well as for updating the associated implementation challenges. At the same time, they will have the possibility to use obtained data in order to extract the main growth drivers of their region and cooperate with other project regions for sharing resources, exploiting common assets and combining capabilities for enhancing growth opportunities in the silver economy. Research organisations and companies can use data from market studies as the baseline for a strategic partnership in providing a common response to market needs and changes. Through vertical cooperation with research organisations, companies will improve their capacity to valorise research results, respond to the identified market needs by involving end-users in the product development process (testing, trials, validation) and apply the smart specialisation approach in their activity. (Market Analysis, Denmark 2019).

The summaries of all the market analyses carried out by the Osiris partners will be introduced to the following stakeholders:

- Osiris partners and associate partners
- National policy makers
- Regional policy makers
- Municipal policy makers
- Regional media
- National and regional associations representing the silver economy
- Entrepreneurial associations
- Regional development centres
- Units researching silver economy related matters in different research institutions, universities and universities of applied sciences
- Enterprises
- The end users

b) Who will contribute to the analysis?

The report focuses on providing recommendations that can be passed on to the Business Authorities in different Osiris project countries in the Baltic sea as well as other actors such as knowledge institutions, business incubators, regions, municipalities and Osiris associate partners. The results of the analysis will help support the development of several new tools.

3. Definition of the market, the business and the users (who are we talking about?)

The EU silver economy in 2015 was estimated to be worth EUR 3.7 trillion. Just over 10% of this total figure relates to public expenditure for the benefit of older people. Taking into account population projections, the study estimates that the EU Silver Economy will increase by approximately 5% per year and will amount to EUR 5.7 trillion in 2025.

The ageing of the population not only poses many challenges, but also opens up new opportunities. There are currently over 200 million people over 50 years of age in the European Union. Together they reportedly spend more than EUR 2.5 billion annually on goods and services. This market reports exceeding 5% annual growth and by 2025 it could reach EUR 4 billion. Such trends have led to the growing importance of the silver economy concept in recent years.

The market for welfare technology consists of companies, knowledge institutions, network organisations and the users, and an increasing amount of awareness surrounds this market. Although the first age levels in the silver economy, ranging from 50 to 63 years of age, are still very active consumers and interested in different kinds of private economy consumption, the fact is that the older ages need more services provided by the public sector.

For example, the demographic development in Denmark – with more people requiring care and fewer caregivers in the workforce – adds to the pressure to develop new solutions, but the technological development also helps create new opportunities to benefit people in need of care, healthcare professionals, as well as the economy. (Market Analysis, Denmark 2019).

The market consists of 1,256 different businesses and retailers that supply a variety of aids and devices. In the Region of Central Jutland specifically, a number of different types of networks working in the field of welfare technology are based. A handful of these clusters and networks are listed and briefly described in the market analysis, which illustrates the vast number of opportunities for businesses, healthcare professionals, and authorities to exchange and gain knowledge. (2019: Markedsanalyse af det velfærdsteknologiske landskab i Region Midtjylland. Intern rapport udarbejdet til brug i Osiris-projektet GA 2.1.)

Country	Total population (million)	Population of 50 plus years old (million)
Denmark	5.8	2.3
Estonia	1.3	0.5
Finland	5.5	2.3
Latvia	1.9	0.8
Lithuania	2.8	1.2
Russia	144.5	na

For example, in Estonia the total amount of retirees in 2018 was 375,649 and their share of the total population was 28.5%. Most of them were old age pensioners (over 304,000). (www.stat.ee/58094 Tallinn Pensioners Association <http://www.tallinnaeakad.ee>.)

Research regarding welfare technology can be divided into two categories: 1) the use of welfare technology and 2) developing welfare technology. Respondents in this study emphasised the importance of collaborating across categories, disciplines, sectors and groups of actors to reach the

best results and ensure the best possible implementation of these results. (Market Survey, Estonia 2019).

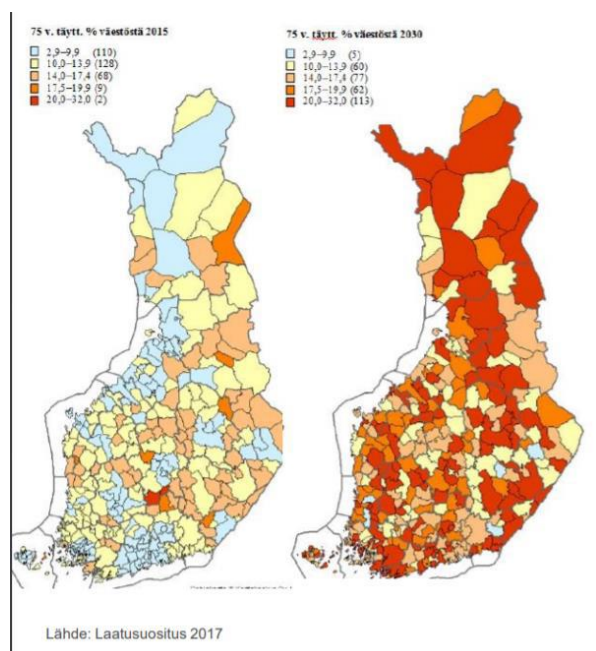
In Denmark, research and development of welfare technology takes place at universities, university colleges and Danish Technological Institutes (GTS), and these actors recognise the necessity of collaborating with users and businesses to translate their research results into projects and education. (2019: Markedsanalyse af det velfærdsteknologiske landskab i Region Midtjylland. Intern rapport udarbejdet til brug i Osiris-projektet GA 2.1.)

According to the “Hjælpe middeldatabase” (Danmark Statistik), in 1980 there were 4.2 residents between 18–64 for each citizen over 65 years in Denmark. In 2050, this number is expected to be 2.3. In 2015, there were 83,000 jobs in 4,000 industrial business and smart industry is perceived to be strong in the region. Few of the new companies are characterised as growth companies (less than 0.5%.) There is a lack of venture capital, and perhaps also a lack of entrepreneurial competences, which may explain the lack of success. (Market Survey, Denmark 2019).

In Denmark there are more than 1,000 companies that develop, sell or retail assisted living technology.

According to one Finnish research report (Knuutila, 2017), the dominant discursion regarding the ageing society includes:

- The transition from traditional institutional care to home care
- Self-determination, the freedom to choose services, independence and the participation of senior citizens in planning their care
- The development of different services
- Cost calculation: old people are seen an expensive burden on society
- The views of supporters of traditional social and health care
- The views of supporters of centralised and/ or digital services
- Acceptance of the fact that society is ageing



Left: The proportion of the population over 75 years old in 2015 in Finland

Right: The proportion of the population over 75 years old in 2030 in Finland

The market analysis in Finland was carried out in two regions: Häme and Uusimaa. The Häme Region consists of three subregions: Forssa, Hämeenlinna and Riihimäki. The region has a total area of 5,700 square kilometres and more than 175,000 inhabitants. Now, 23% of the population is over 64 years old. Traditionally, the main industries in Häme have been heavy industry and food industry. The present fields include growing construction sector, repair services, circulation economy, bio sector and healthcare facilities. The target in the region is to invest more in smart solution technologies and services in the near future.

In the Uusimaa Region, the proportion of the population that is over 64 years of age is 17%. The region has a total population of 1,685,263 and a total surface area of 9,568 km². Its capital is Helsinki.

In Lithuania, the calculations show that the population is not only shrinking, but also that the structure of it is changing. Fifteen years ago, the proportion of the population that was over 55 years of age was 25.7% of the total population. In 2019, this proportion is already over a third: 34.4%. The highest increase is in the group of the oldest people, i.e. those over, which has risen from 6.0% in 2004 to 9.9% in 2019.

Lithuania has the fastest ageing population in the European Union. The proportion of elderly people has doubled in the last 20 years and now stands at almost 19%. It is likely that by 2040, every third resident of Lithuania will be 65 or older, subsequently increasing the average age of the population by more than five years. Such rapid ageing of the population is becoming a major challenge for today's society, with a direct impact on health, economic development, quality of life and social unity. (Market Analysis Lithuania, 2019).

The healthcare challenges of an ageing society include the need for balanced development of prevention, treatment, and long-term care and nursing services. According to *the Institute of Hygiene* data, out of all the population over 60, around 92.4% were ill back in 2016. People aged 65 and over accounted for 70 percent family doctor consultations, 36.5% in-patient patients and 51% bed days.

Lithuania's economy is also faced with the negative effect of an ageing population, which will become increasingly important in the future. Over the last 25 years, the ratio of people over 65 and the working age population has risen from 16.2% in 1990 to 28.1% in 2015. The working-age population per capita, on the other hand, has fallen from 6.2 to 3.6 over this period. Eurostat forecasts that by 2040 this ratio will rise to 56% and the working-age population per senior population will fall to less than two.

Increasing life expectancy puts pressure on the social security system, which is now faced with quite a few challenges as a result of the ageing of the population. This sector is likely to require more funds as well as more developed care and social services. However, as the working-age population shrinks, consumption will slow down, which is likely to cause insufficient income coming from tax collection in the state budget, which in turn will influence opportunities to finance public services.

4. Background information concerning the respondents

a) Denmark

The analysis in Denmark is based on 27 qualitative interviews with a total of 33 people from the different groups in the *Region of Central Jutland*. The interviews were conducted by asking questions designed for each group individually but touching on the same themes. Each interview was then transcribed and approved by the respondents.

Nine people across four councils representing the elderly have been interviewed for the study. These councils have been set up by municipalities, and their purpose is to represent senior citizens and act in their best interests. The region is particularly focused on Smart Industry and Growth Drivers, and it is emphasised that Smart Industry is in a position of strength in the region. This market review is based on the qualitative interviews of five different groups.

Five healthcare professionals – two social and healthcare assistants and three managers – were interviewed for the study, and the majority of these respondents work with people whose disabilities prevent them from living on their own.

Two people working in business incubators in the Region of Central Jutland were interviewed. Representatives from nine companies that develop welfare technological solutions aimed at the elderly have been interviewed for the analysis.

Since knowledge institutions are an important part of the landscape of welfare technology, seven interviews with representatives from Aarhus University, the Alexandra Institute, Aarhus University School of Engineering, and social and healthcare colleges have been conducted for the study. (Market Analysis Denmark, 2019).

- Representatives of the municipalities' councils for senior residents (4 councils, 9 interviews).
 - Representatives of clusters and organisations providing innovation support (2 interviews)
 - Business people that develop and trade assisted living technology (9 interviews)
 - Care givers (5 interviews)
 - Representatives of knowledge institutions (7 interviews).
-

b) Estonia

The survey was conducted in Tallinn in June 2019 and was split into the following age groups:

- 46–55 (12)
- 56–65 (7)
- 66–75 (14)
- 76–85 (11)
- > 85 (11)

- A total of 55 elderly people were interviewed in these age groups

Health condition:

	Bad	Good	Acceptable	Very bad	Very good
46–55	0%	32%	15%	0%	20%
56–65	33%	12%	10%	0%	20%
66–75	33%	12%	35%	0%	60%
76–85	33%	28%	15%	0%	0%
>85	0%	16%	25%	0%	0%

c) Finland

The Finnish study is based on the answers of 59 seniors and 73 market players in Häme and Uusimaa regions. The respondents are as follows:

Market Players

- A total of 63% of the market players represents social and health services and 19% other services.
- The rest of the respondents (18%) were from various other fields of industries.
- The revenue of the companies was relatively small. Over 50% of the companies had a yearly revenue less than EUR 200 thousand, and 15% something between EUR 400–999 thousand.
- About half of the companies produce, and half of the provide the services and or products to the elderly people.

Seniors:

- 55–64 years 17%
- 65–74 years 24%
- 75–84 years 27%
- 85 or more years 32%

Health condition:

- Of those interviewed, 7% considered their health to be excellent, 41% good, 42% decent, 8% poor and 2% bad.
-

d) Latvia

Seniors: 40 interviews

- 55–64 years 23%
- 65–74 years 30%
- 75–84 years 25%

- 85 years and over 23%

Health condition:

- Of those interviewed, 28% considered their health to be very poor, 23% weak, 23% satisfactory and 28% relatively good.

Organisations: 26 interviews

- Senior Organisations 11 interviews
- ICT Association or ICT companies 4 interviews
- Senior Nursing Care Centre of Medical Institutes 3 interviews
- The Association of Pharmaceutical Industry or Pharmaceutical Company 2
- Start-up Association or Start-up 1
- Others 3

e) Lithuania

The objectives of the study in Lithuania were, e.g. as follows:

1. An overview of the situation of seniors at the national level and, in the case of official data, in each municipality of Lithuania according to age, the proportion of seniors in the structure of the population, employment and other, independently chosen parameters.
2. Survey municipal wards to identify the most relevant areas for seniors (health, nursing, mobility, education. etc.) and the problems they face and their possible solutions. Identify what innovative products and services the seniors are currently using.

The questionnaire was circulated through the Lithuanian Association of Municipalities. The study was conducted between 27 and 31 May 2019. Of the 450 neighbourhoods to which the questionnaire was sent, the replies were sent to the 171 deans. The data included all the counties of Lithuania.

f) Russia

The respondents in Russia were as follows:

40 respondents of different age groups and some experts and companies; these interviews were conducted in person or by telephone.

Statistical sample type: no-random, quota; method for determining the size of a statistical sample: empirical; statistical sample structure; respondent search method: "snowball".

- Group "55–64": 15 respondents, 10 women, 5 men.
- Group "65–74": 15 respondents, 12 women, 3 men.
- Group "75–84": 5 respondents, women.
- Group "85+": 5 respondents, 4 women, 1 man.
- Experts: 3 experts, these interviews were conducted by telephone.

5. Analysis of the market for Smart Technologies:

The perspectives of the interviewed companies and experts

a) Denmark

The market analysis in Denmark was carried out in the Central Jutland Region. The region is particularly focused on Smart Industry and Growth Drivers, and Smart Industry is seen to be strong. The region thus recommends that companies continue the effort to further improve on digitisation, automation etc. in order to ensure continued growth.

In Denmark as a whole, there are relatively few growth companies, which is a problem caused by limited access to venture capital and a general lack of entrepreneurial competences. Additionally, a shortage of human resources challenges companies and their growth.

In 2015, there were 83,000 jobs in 4,000 industrial business and smart industries perceived as strengthening the region. Few of the new companies are characterised as growth companies (less than 0.5%). A lack of venture capital and of entrepreneurial competences may explain the lack of success. There are more than 1,000 companies in Denmark that develop, sell or retail assisted living technology (Hjælpe middle database, www.hmi.dk).

The representatives of nine companies that develop welfare technology solutions aimed at the elderly have been interviewed for the analysis. **The trends experienced by these respondents are more AI solutions that monitor the health of citizens as well as solutions that can help elderly people stay in their own homes longer.**

They believe that a paradigm shift is happening, wherein we are **abandoning a more clinical approach in favour of an approach that focuses on experience. Several respondents see the Danish municipalities' procurement system as a significant barrier to the survival and growth of their businesses, as the rules are tough to manage, and the respondents would like to see these regulations change.**

Furthermore, they all recognise that because of the size of Denmark, **export is a necessity**, although it can prove very difficult for new companies. Generally, these companies do not experience a lack of knowledge, but **they would like to be able to get more help locally and more collaboration with users to further develop their products. Respondents also wish that the market in Denmark was less focused on price and more focused on durability and applicability, and the welfare of employees.**

The respondents mentioned **the barriers for companies to have access to clients in the municipalities and testing facilities as well as financing and knowledge about entrepreneurial skills.** In general, the respondents said that they were aware of ethical issues, but that was not seen as a major issue. **The welfare society in Denmark makes a good base** for the companies (to develop and test their products in order to be ready for bigger markets). The respondents considered the network to be important but mentioned also that one must prioritise sometimes.

Joint venture cooperation between companies and customers (municipalities) would promote growth. According to the people interviewed, access to knowledge as a general is not a problem in the development phase.

Since knowledge institutions are an important part of the landscape of welfare technology, seven interviews with representatives from Aarhus University, the Alexandra Institute, Aarhus University School of Engineering, and social and healthcare colleges have been conducted for the Danish study.

Respondents of the knowledge institutions believe municipalities sometimes slow down growth by having trouble planning future initiatives, and they emphasise the need for more long-term perspectives by municipalities as well as standardised procedures across municipalities and businesses.

They believe that further development requires the involvement of both users and healthcare professionals and utilising their inputs. **Like the business incubators, these respondents identify the challenge of using people's data, and they recognise that they may need to consider people who are more sceptical of welfare technology in order to gain insights about possible ethical challenges.**

In Denmark the network is important, even crucial for the incubators and clusters. According to the respondents, it is also of great importance to be present locally because the companies see this presence to be useful for them.

The respondents mentioned that there is **a lot going on in big data**. It will be interesting to see how it helps to prevent and predict diseases and conditions, e.g. regarding bedsores.

The respondents listed some suggestions, such as **there ought to be strong, locally funded environments where start-ups can get the relevant help**. Access to municipalities and the knowledge from universities ought to be easier for start-ups. GTS institutes should be the mediator between companies and research, but they are too expensive for the SMEs and the big companies can afford to commission their own research. OPI contracts (Office of Public Instruction) help the companies (public/private innovation) and implementation should be "as sexy" as innovation.

Research and innovation are supported through several national and EU-based public support mechanisms. Additionally, individual municipalities and regions have different programmes that support the development of welfare technology. The companies in our study also mentioned private investors, so-called "**business angels**," as a source of funding.

b) Estonia

According to the research, the last option for Estonian seniors is to move to a nursing home. **Most of the elderly people** are not pleased to live there but **would like to live home as long as possible**. **The pension system does not allow the seniors to purchase the services necessary to enable them to stay at home as long as possible.**

The seniors who are able to cope with their pension and manage their daily lives, must be actively involved in all aspects of life from education to work in accordance with the Ageing Programme 2013-2020. (<https://www.sirp.ee/s1-artiklid/c21-teadus/vaarika-vananemise-teekond/>).

One problem is that there are long queues to the residential institutions and the remuneration of the private institutions is too expensive for the seniors with low pension. This means that many seniors must financially lean on their children.

Estonia has the lowest pensions throughout the European Union due to the pension system, and **many senior citizens need to go to work, irrespective of whether their health status is good or not.**

c) Finland

The companies interviewed in Finland provide services like dental care, rehabilitation, maintaining and supporting people's ability to function and medication reminders. **The senior service industry in Finland is recognised as a strongly growing one, but its image is not considered to be good.** In many points the market players mentioned **the need of rebranding digital services aimed at seniors. There should be more and clearer communication regarding digital services in the future, as well as more assistance.**

The respondents pointed out that there are a lot of different needs to be solved among the seniors, such as social and hygiene needs, loneliness, the need for outdoor activities, the general need for care, and security for those with dementia.

They also mentioned that the availability of healthcare services for seniors tends to be regarded as being of secondary importance. Seniors are also left completely out in the cold regarding digitalisation, which is tantamount to age discrimination.

Barriers to mobility were also considered in the market players' answers. Barriers to old people going to the doctor, for example, were one future challenge. There is a feeling that nearly all services, from providing advice on digital services and devices to visits to the doctor, should be turned into mobile ones. There is a desire to extend the time that seniors live in their homes as long as possible, such as through home visits by various services, but one of the greatest challenges in this regard are staff resources and professional skills.

Most senior respondents have a mobile phone/smartphone, computer, TV and/or tablet at home. It was hoped that in **the future technology would meet the safety and mobility needs of seniors the most.**

There are also a lot of need for unobstructed housing, mobility and utilisation of technology in care work. Further, there are needs for devices that facilitate communication between the elderly and their relations, such as e.g. a view to the room via smart devices in order to create and improve interaction situations. Now, many of those living at home suffer from loneliness. According to the respondents, the most important factors in the future are delivering home-based services, developing technology, and developing home-help services for the elderly.

According to the respondents, the elderly is also entitled to various benefits, but they either do not want these or do not know how to apply for them. This should be automated.

In Finland it was mentioned that it is difficult for companies to get relevant information now. The suggestions to improving this barrier include holding seminars and arranging forums where the service providers and decision-makers could discuss these things more, so that knowledge could be transmitted. It would be useful to carry out all sorts of surveys and **develop players' network cooperation.** Knowledge can be received also by asking everyone involved about these things. Companies suggest also to strengthen cooperation between the public, private and third sectors.

As another barrier for the development of business, the respondents mentioned a need for additional resources in the future. Having **qualified, educated employees is the key factor** for developing and selling the products and services. Also, **high taxation** was considered as a barrier for developing the business.

The respondents pointed out that **one big challenge is cities purchasing the services through tendering, which means there is intense pressure to cut prices**. In this situation there is no chance of hiring personnel. And then the companies would have to worsen our services again and tighten their timeslots to make it profitable.

When it comes to seniors as customers, the companies address their worry over the skills of old people in using modern technology. *“Can the elderly adopt the use of digital services? That’s really the biggest problem. If they can be adopted, then they can also be used to somewhat replace those services. But if you can’t handle digitalisation to the extent required, then digital services should also be provided as simply as possible. What I have seen in practice is that adoption is the biggest challenge.”*

The respondent mentioned also that the seniors are not interested in learning how to use new devices. They prefer face-to-face meetings instead of communicating via screens. There are also a lot of prejudices towards new technology. (Market Analysis, Finland 2019).

d) Latvia

Although the Latvian organisations acknowledge that the development of the silver economy provides an opportunity to both create new products and services for seniors and export them to new markets, still, overall, **the senior economy is not held to be a high priority**.

The main barriers to the introduction of digital services for seniors in Latvia are the low purchasing power of seniors and low level of digital skills. Other, less frequently mentioned barriers are a **lack of public funding and applications, device design and management functions that are inappropriate for seniors**.

In the next twenty years, moderate updating of the senior economy is expected, mainly in the private sector. It is not forecasted that the senior economy will be ascribed an extremely important role.

According to the experts, the most important obstacle to the development of digital services for seniors in Latvia is **insufficient funding** – both low purchasing power of the seniors and **the lack of state financing and private investments**.

As the next major barriers identified by half of the organisations, experts mentioned technology-related barriers: **lack of healthcare systems, lack of interoperability of devices, and low digital skills of seniors as well as legal aspects – deficiencies in both policies and legislation**.

Another group of obstacles identified by at least a third of experts includes applications, device design and management functions that are inappropriate for seniors, low digital skills among the service providers (carers, medical staff) and incomplete or unfinished technical solutions.

For the polled organisations, updating of the senior economy mainly provides opportunities to expand the range of products and service, and, for some of them, **to expand the market also beyond Latvia.**

e) Lithuania

The main providers of services for the elderly in Lithuania are the public sector, i.e. municipalities, municipal enterprises and public institutions which have social functions delegated by the state and the appropriate funds for the implementation thereof. These organisations provide services that focus on specific groups of older people like disabled, content-impaired, dysfunctional, and addictive. The services provided are related to health care, social welfare, long-term and short-term social care and care, prevention programmes, etc. Services for seniors are also provided by non-governmental sector organisations (Red Cross Society, Lithuanian Samaritan Society, Lithuanian Caritas, etc.) whose services are focused on the fight against poverty and the exclusion of marginalised and lonely people in Lithuania.

These organisations provide humanitarian assistance to disadvantaged citizens, carry out social prevention, implement care and social programmes, develop the social services network, establish day centres and care facilities. Non-governmental organisations also provide educational or preventive health programmes (e.g. Medart Chiobat's Third Age University, Association 'Bociai').

Services for seniors are also provided by private sector entities, which mainly target middle-income or higher-middle-income older people with higher purchasing power. They provide wellness, rehabilitation, personalised healthcare, senior travel services, body care, personal care, etc.

The main factors that hinder the delivery of innovative services and the development of innovative products aimed at older people are related to several causes, one of which is related to the psychological aspect of older people's behaviour.

Each innovation that takes place requires some individual effort to master the use of technology (computers, the Internet, mobile devices, etc.), but for many older people there is a psychological fear that technological innovations are very difficult to use and that they will never learn to do so. Such attitudes hinder their involvement in the use of new technologies.

Another reason is **the inadequate infrastructure to implement new technological solutions.** The deployment of certain technologies requires appropriate infrastructure, which older people often cannot afford due to a lack of finances, a lack of basic infrastructure (internet access, telephone line, mobile phone, etc.) or the lack of ability to ensure the reliable operation of technology.

Another reason is **the poor public perception of older people**, which discourages them from tackling their problems and prioritising new innovative products and services nationwide. It is also negatively affected by the fact that **older people and their problems are not a state priority**, and that **the promotion of the silver economy is only a single initiative of different groups of society, which does not have wide-ranging impact.**

f) Russia

The key finding in Russia was that companies are interested in working in the silver economy segment. At the same time, there are financial and social difficulties that hinder development. Companies offer products that are socially significant and useful for people, improving their quality of life and solving several social problems.

Cooperation with the state for companies is perceived as bureaucratic red tape and producing many difficulties. Potentially, such a partnership is possible, but requires changes in processes at the state level. At the same time, companies see and are interested in cooperation with the state at one level or another. Companies have ideas for development in this area. The companies are also looking for investors outside Russia.

All companies are ready to improve and develop their products in the future, focusing on the older generation. Companies are aware of the problems of the older generation and the difficulties of working in this segment. At the same time, these difficulties do not scare them. They work in this market and try to approach individually to consumers over the age of 50.

One company respondent said that the profitability of work in the segment of older seniors is very promising and profitable, but the development of the company and the product is a time-consuming and expensive process. Their own funds are not enough, therefore they must look for an investor. **Help from the state is possible, but it is very burdensome and there is too much bureaucracy.** That is why they are looking for **investors outside Russia**. They have a different attitude to such projects and understand the prospects of their products.

He told that the company is only developing in the B2B market. Now they actively cooperate in Russia with private hospitals and various health centres, rehabilitation centres and dispensaries, which are ready to take certain risks, and are open for cooperation. In the future, there are plans to enter the B2C market, but there is still a lot to do. They would like to cooperate with polyclinics and municipal hospitals, because their technology would be of great benefit to people and not as expensive as foreign analogues, but again paperwork, which hospitals are burdened with do not allow cooperation.

The respondent said that the biggest problem is **the lack of finance**. This is a global problem that is difficult to solve in Russia. **The investors do not understand the prospects of the area.**

The perspectives of the interviewed end-users, service providers and the representatives of different senior associations etc.

a) Denmark

Nine people across four councils representing senior citizens have been interviewed for the Danish study. These councils are set up by municipalities, and their purpose is to represent senior citizens and act in their best interests. These representatives generally view the development in welfare technology as a positive, but they do see a challenge in convincing senior citizens that these technologies are a benefit and not a necessary evil.

Several councils highlight the difficulty in figuring out what is on the market and where to gather information. It is the experience of the council representatives that they are not being heard sufficiently, and **they experience that financial concerns are generally being considered more than the lives and welfare of citizens.** The council representatives generally suggest that **the implementation of devices and technologies in citizens' lives should happen at an earlier stage, so they have an easier time adapting to these. They also suggest more accessible information about different technologies and aids.**

Five healthcare professionals – two caregivers and three managers – were interviewed for the Danish study, and most of these respondents work with people whose disabilities prevent them from living on their own. It is the assessment of the respondents that **citizens generally require more care than earlier** and that more people survive and live with one or **more chronic illnesses**, which means that caregivers are faced with more complex tasks regarding such citizens. **The respondents experience that citizens are open to the use of assisted technology in their care.** A benefit of using technological solutions is the ability for the caregiver to work alone with a citizen, which creates a stronger sense of intimacy.

Generally, the respondents experience a lack of knowledge about assisted living technology, and they also express a desire for more communication and information when it comes to implementing new technologies and aids.

Similar to the council representatives, the healthcare professionals advocate for an earlier implementation of technology in citizens' lives, and they emphasise a need for more individualised solutions to accommodate the difference in citizens' needs. **However, they do warn against the potential of assisted living technology leading to fewer caregivers, which could cause citizens to feel lonely because they would be on their own more often.** (Markedsanalyse af det velfærdsteknologiske landskab i Region Midtjylland. Intern rapport udarbejdet til brug i Osiris-projektet, July 2019)

The respondents of the care givers and assisted living technology said that the technology must make the working environment better and make the residents secure and safe. Some solutions make it possible for the care giver to take care of the citizen alone. This is a huge advantage for both parties –more presence and intimacy. It was also mentioned that **the implementation is a challenge: it is hard to get all colleagues to join the new procedures and it takes a lot of time.** On the other hand, it was mentioned that there is not a lot of ethical challenges–but it is always a focus area. The respondents wished to have more knowledge about solutions.

The respondents also had a list of suggestions regarding the possibilities to improve the quality of life and the use of assisted living technology. They stated that there are more and more residents with **multiple diseases.** Therefore, **there was more need for individual care, solutions and treatment – every person has a unique combination of needs. They thought that seniors should start using assisted living technology at a younger age –and to get used to it.** They hoped that they would be listened more and given more information about possibilities – also regarding things the citizens have to buy themselves. They also mentioned the fact that **many older people were lonely**, and that the technology should not leave the residents alone. They also reminded the importance of the language, i.e. how we talk about the technology.

b) Estonia

In Estonia, the focus will be on integrated care services targeting at least those who are aged 65 over years of age, living in their homes and having several different health and social care needs. Integrated care services aimed at alleviating the different needs of older people, in other words, they should not focus on one disease. The integrated care services should also help people cope with their home conditions as long as possible.

Seniors reported that they use **different moving aids** (stick, motion frame, etc.), but moving on the street is difficult with them, because the streets are often bumpy. Respondents also told that they use **hearing aids** if the hearing had deteriorated. Quite many use blood pressure meters daily.

Younger age groups use various portable devices which are connected to the computer and collect health data. Everyone had a phone at home, either an older phone with buttons, or a smartphone. It was mentioned that the use of the latter was harder if a person's eyesight was poor. Many older people **had an alarm button** for a sense of security.

Seniors in the older age group relied much on their children and friends. Children and friends helped seniors in various tasks like transportation. Instead of using home help the seniors ask help from their children, grandchildren and younger friends who help them in cleaning and performing other major tasks. The younger groups told that they order ready-made food home.

c) Finland

About half of the senior respondents considered themselves to be laggards when it came to technology use. The older the respondent, the likelier it was that they had issues in using technology. In open comments, the senior respondents said that they either **were not interested in learning** how to use digital services or they simply **were unable to learn**. Market players wished for a considerable increase in services that guide people in the use of digital services and equipment.

About one in three senior respondents used mobility aids and services at the time of the study. About one in five also had some device or service that facilitated cleaning. Of the senior respondents, 48% believed they would be using mobility aids and services in about five years. 35% thought the same regarding cleaning devices and products. Only 13% of market players provided mobility services and 8% cleaning services. However, when interpreting the results, one has to take into account the sample itself and its size.

When asked what needs does technology address right now in their everyday life, the seniors' responses included:

"The ease and warmth of living in a flat with terrace glazing. Air source heat pumps boost ventilation." "It makes you feel safe when you have your mobile phone with you outside." "With your phone and iPad, you can interact with people all over the world." "The emergency watch makes me feel safe." "Online store applications." "Contacting the children by phone and knowing where they are."

Seniors answered the question "What needs should technology particularly address in the future?" as follows: *"Security-related things, various alarm systems. If you need help you can get it easily, or there's some alarm that says, for example, that your washing machine is on." "Living at home, that there would be a reliable sheltered home. For home, I can't imagine anything more that would be needed."*

d) Latvia

Among the seniors in Latvia, the interest in using different solutions personally is significantly lower than the perception of their usefulness. Half of the persons do not wish to use anything from the offered innovations.

At the same time, **the use of mobile devices for monitoring the vital signs attracted the biggest interest**, which is desired by every third person. It is also recognised as a priority for Latvia among experts of the organisations themselves. About a quarter of them are also prepared to use the offer for increasing their digital and computer skills, smart house technologies in the homes of seniors and to master digital messages and cognitive training games. **It was observed that among seniors with very poor health conditions, the interest in using the smart house technologies is higher than among the seniors with better health conditions.**

The polled senior organisations and senior residence, care or treatment institutions are sceptical about this. However, representatives of other organisations, particularly representatives of the pharmaceutical, educational and tourism industries, have also been sceptical and have more frequently agreed to the opinion that neither the public nor the private sector attach importance to the senior economy and it is neither targeted nor developed.

The older the age, the higher is the reluctance to use any new digital solutions for improving the lifestyle of seniors. It can be concluded that the lack of digital skills among seniors is currently a major barrier to the use of the opportunities offered by smart technologies. Among those who cannot work with a computer and the internet, the readiness to test any of the solutions is the lowest. However, the readiness to increase their digital and computer literacy in this group is even lower – only 13% of this group show willingness to do so.

From a 20-year perspective, **there will be more intense work on the improvement of digital skills of seniors** as well as implementation of integrated technologies, wearable devices, integrated care services and advanced connectivity, improvement of digital skills of caregivers, personalised medicine, nutrition recommendation applications and digital cognitive learning games. Considering the results of the senior polling in different age groups, there are no significant differences in their interest towards specific technological solutions. The results of the senior polling reveal a relationship between the reluctance to use any of the offered technological solutions personally and the age of the respondents.

According to the expert assessment of organisations, **neither the state nor the private sector has yet ascribed an important role to the senior economy.** It can now be described as rather unimportant to both sectors; it is neither targeted nor developed.

e) Lithuania

The main factors that hinder the delivery of innovative services and the development of innovative products in Lithuania aimed at older people are related to several causes, one of which is related to **the psychological aspect of older people's behaviour.**

Each innovation that takes place requires some individual effort to master the use of technology (computers, the internet, mobile devices, etc.), but for many older people it is due to the **psychological fear of innovation that it is very difficult and that they will never learn how to use new technology.**

Such attitudes hinder their involvement in the use of new technologies. Another reason is the inadequate infrastructure to implement new technological solutions.

The deployment of certain technologies requires appropriate infrastructure, which older people often cannot have due to a **lack of finances, lack of basic infrastructure** (internet access, telephone line, mobile phone, etc.), or a **lack of ability to ensure the reliable operation of technology**.

Another reason is the poor public perception of older people, which discourages them from tackling their problems and prioritising new innovative products and services nationwide. It is also negatively affected by the fact that older people and their problems are not a state priority, and that the promotion of the silver economy is only a single initiative of different groups of the society, which does not have wide-ranging impact.

Following the analysis of the issue of seniors continuing working life, **it was found that a significant number of retired seniors have a need to continue working**. However, there should be consideration of introduction of special working conditions: part-time work, work at home, shift work, work organisation etc. Innovative solutions could include the creation of flexible forms of work (job sharing, workplace learning), empowering older people and seniors to create innovative businesses, setting up senior business incubators, developing start-ups for seniors, etc.

The issue of mobility of older people is related to the fact that a large proportion of older people live in remote rural areas, have restricted mobility, rarely use public transport as it is not suitable for people with mobility issues, etc. While innovative solutions such as social taxi services are already in place in this area, they are not sufficient to solve mobility problems. Possible innovative solutions to this problem would be to provide services related to innovative IT solutions: optimisation of public transport movement routes, development of innovative public transport sharing/transportation platforms, and autonomous public transport.

Another major issue that requires **innovative solutions is that of health services**. The main areas identified as being the most prominent to the elderly in Lithuania and most receptive to the development of innovative products and services are related to: **the lack of a seamless network of services for the elderly, insufficient levels of professionals with an adequate medical knowledge in geriatrics, understaffing in emergency medical services, the lack of timely health monitoring, proper disease prevention, lack of early diagnosis, etc.** Possible innovative ways of solving this problem include: **developing and mobilising platforms** for health monitoring, control and prevention that provide healthcare providers with real-time information on patient behaviour, interactive application platforms that include a wealth of interactive applications that provide training, physical measurement, pain reduction, providing real-time analysis to users and clinicians, etc.

In addition to this, develop a variety of innovative devices that allow real-time health monitoring, e.g. portable bracelets for data collection, patient social networking, health monitoring devices to monitor patient sleep, nutrition, leisure, etc. as well as developing services and products for m-health devices, such as neurological, cardiac, apnoea and sleep monitors and m-health, covering prevention, diagnosis, monitoring and patient status to better diagnose, target medication, reduce adverse drug reactions, and meet others health needs of older people, and so on.

After analysing the issues social services have providing for the elderly, it can be stated that they are mainly related to **inadequate interinstitutional coordination of their provision**, integration into one comprehensive package of services, quality and assurance of long-term care services, the package of daily social services and the adequate qualification of social service providers. Innovative solutions to

this problem may be related to IT solutions that will allow some social services to be transferred to the online space. As well as allowing new social businesses employing new innovative ways of delivering social services such as self-help platforms and smart housing solutions that allow older people to live independently for as long as possible.

Innovative solutions such as smart TV, innovative channels of communication, mobile applications, online platforms for communication and knowledge sharing, etc., can be used to solve the problems related to the dissemination of information, which the elderly in Lithuania have identified as very important.

Elderly people in Lithuania have identified crime prevention as one of the topical areas where there is a need to develop innovative solutions and services related to ensuring the safety of seniors. This could include smart video cameras or other technologies capable of capturing and preventing crime, innovative approaches to educating seniors in self-defence and protection, innovative community-based initiatives, and so on.

Loneliness and social isolation are major risk factors for the morbidity and mortality of seniors, so leisure is another important issue. The survey identified that senior leisure concerns are most relevant to seniors themselves, as they are less well informed about possible leisure activities.

f) Russia

Many respondents would like to receive support from the state, for example, a discount system for pensioners or specialised free trips to health resorts (“sanatoriums”), Russian seaside resorts etc. The 85+ age group wanted the state and social workers to identify specialists who would help them lead. Currently, such a function exists, but this is a paid service, and for pensioners a daunting additional expense.

What comes to the social sphere, the conclusion in the report was that **there exists a negative attitude towards state structures regardless of age and social status. The respondents mentioned that all the processes are slow, and the personnel is unprofessional. People do not trust the state and do not expect help from it. They rely more on themselves or their families.**

Many seniors noted **a lack of qualitative information about benefits; where to get the information and how to receive the benefits.** The seniors were not able to search the relevant information and their main motivation seemed to be based on the need to solve urgent issues or to find out information on a specific issue instead of receiving some general information.

Seniors had **many complaints about healthcare institution. Most often about the quality of the service in public institutions.** They thought they didn’t get consultation from the qualified specialists.

When contacting public clinics, seniors complain about the **queues**, the procedure for accepting a patient, and the quality of services provided. Also, residents complain about the **high cost of medicines.** Many respondents didn’t know how to sign up for a doctor with the help of an electronic queue, which could greatly facilitate the recording procedure.

It seems that the patients do not trust young specialists, but at the same time, they say that doctors in institutions do not try to help, because they do not care about the patient and spend a lot of time on paperwork, time which they could devote to their patients.

There was most dissatisfaction with the size of pensions in the groups aged 55–64 and 65–74. In these age groups, people are trying to be independent and live on their funds. In the 75–84 and 85+ age groups, respondents were satisfied with their income, because they received help from their relatives. Aged 55–64, respondents generally still financially help their children. The “65 – 85+” group starts bucking the trend. All respondents 85+ received help from their relatives.

Most respondents said that the living environment did not suit them. Among the shortcomings mentioned were:

- Lack of facilities for people with disabilities
- Lack of facilities for mothers with children (no ramps for wheelchairs)
- Lack of elevator
- Lack of freight elevator
- Elevator breaks down often
- There is no space and the necessary security to leave things (bicycle, stroller, etc.)
- Lack of a good road at the entrance and normal lawns
- Old house façade
- Lack of handrails and high steps

6. The Future Market, needs for smart technologies and other services, and key findings

To conclude, it seems that there are some similar and some different barriers and potentials in the countries where the market studies were carried out. One interesting observation while reading the studies is that the silver economy and the target group were mainly seen as viewpoints of the older seniors instead of people aged 50+, for example. It is obvious that this guides the respondents to vision potential future services and products to the people whose health is notably worse.

Viewpoint of the companies, experts and service providers

In terms of the silver economy-based business possibilities, there was a **lack of funding** in all the countries. In some of the countries, there was also a lack of interest in this field on the side of business. **The senior economy was not seen as “sexy” or alluring, or even very profitable**; on the other hand, it was widely believed that it will grow a lot in the coming 20 years. The expansion of companies into this market is therefore quite moderate. Hence, while the target market will grow in the near future along with the target group, this growth will probably not lead to a demand-led growth story for the region's silver economy. **The main barrier to the introduction of digital services for seniors is their low purchasing power.** In other words, the service providers must create demand despite the users' lack of skill and reluctant attitude. As such, **the investment risk of individual actors** can easily become an unhealthy one, which is why **the region needs ecosystem solutions in order to both understand and serve the target group, as well as start-ups and the universities.**

In Latvia, the following were the barriers for business: the lack of healthcare systems, lack of interoperability of devices, and low digital skills of seniors as well as legal aspects, i.e. deficiencies in policies and legislation.

It was also mentioned in some reports that it would be a good idea for the companies to expand out of their own countries and to find funding elsewhere. The companies in the studies also mentioned private investors, i.e. **“business angels,”** as a potential source of funding.

It was said in the Finnish report that **the digital services need to be rebranded towards seniors.** There should be more and clearer communication regarding digital services in the future, as well as more assistance.

In Denmark and Finland in particular, it was mentioned that **the municipal bureaucracy** with its strict rules and tendering systems is a barrier for business. The processes are time-consuming, difficult to manage and the municipal decisions regarding the chosen service provider are usually based on pricing instead of quality. This means less staff and less possibilities to develop the business. The focus should be on durability and applicability, and on the welfare of employees instead of price. Also, high taxation was mentioned as a major barrier in the Finnish report.

Some reports mentioned that the shortage of human resources challenges companies and their growth. **Qualified, educated employees is the key factor** for developing the products and services.

It was also mentioned in the Danish report that a shortage of entrepreneurial competences may be the explanation for the lack of success.

The Danish market review pointed out that the **cooperation between the citizens, technology, public and private actors** will be more and more important in the future. The businesses and knowledge institutions in the study mentioned especially the need for more collaboration between different actors and institutions regarding both the development and implementation of welfare technology. Several respondents emphasise the importance of individualisation and believe that it is necessary to offer citizens technological solutions that are tailored to their specific needs. The network is particularly important for the incubators and clusters.

Use of technology by resourceful senior citizens will be a necessity in order to release resources for the weakest groups. Individualised packages for the residents, seeing the senior citizen as a whole and their caregivers understanding of the often-complex situation of the citizen is a must. Networks are often geared towards the caregivers, the companies and researchers, there is a need for network (knowledge and information) for senior residents and their next of kin. The implementation process can be improved (education, handling the changing procedures, management support, follow up, listen to objections).

Viewpoints concerning the end-users

Common to all the studies is **the lack of digital skills** or interest of seniors towards digital devices. The older seniors also lack motivation to learn more about the modern technology, they even fear the trend of digitalisation. The respondents of the different groups frequently pointed out that the development of digital services intended for the seniors is currently mostly delayed by the low purchasing power of seniors. Besides that, most of the interviewed seniors preferred face-to-face contact with service providers.

In a couple of reports, it was suggested that the implementation of digital devices and technologies in citizens' lives should happen at an earlier stage, so they have an easier time adapting to these. One of the key findings was also that **the seniors feel lonely**, and at the same time **preferred to stay home as long as possible**. The reasons for that differed in the researched countries. For example, in Russia the queues to the nursing homes were long, the care was considered as expensive and the skills of the staff inadequate. Russian seniors relied on their families instead of public or private service providers. It was also suspected in the report that **the seniors are not aware of all the potential funding and financing possibilities. This system should be automated.**

In Lithuania it was found that a significant number of retired seniors must continue working. However, the introduction of special working conditions should be considered, for example, part-time work, work at home, shift work, work organisation, etc. Innovative solutions could include the creation of flexible forms of work (job sharing, workplace learning), empowering older people and seniors to create innovative businesses, setting up senior business incubators, developing start-ups for seniors, etc.

In some countries, seniors live in remote places and that leads to the need for innovative transport solutions. There is also a need for a leisure infrastructure designed to be suitable for older people. Innovative leisure solutions can include rural-urban mobility programmes, innovative products and

services related to silver tourism, robotic peer-to-peer solutions and innovative collaborative spaces and platforms.

Unlike in other countries, the elderly people in Lithuania have identified crime prevention as one of the topical areas, where there is a need to develop innovative solutions and services related to ensuring the safety of seniors.

It is thought that because the seniors want to be independent and manage themselves, the technology can help them with this. There were a lot of suggestions for improving the quality of life of the seniors as well as suggestions regarding the future services and products in all the reports.

The list of suggestions to improve the services and products in the field of silver economy:

Need to develop services that

- Help people living in remote areas.
- Deliver home-based services.
- Help to find solutions for cleaning, etc. (practical help); this help is difficult to find today.
- Provide information and knowledge to the senior residents and gives answers to their concerns about technology.
- Give knowhow for the care givers about the available technology and how to master it.
- Find solutions to fight against loneliness and to increase level of activity.
- Share more knowledge among the municipalities.
- Provide more cognitive e-training.
- Provide more integrated care services.
- Find solutions to make the transfers/relocation of the residents gentler. (The use of partially or fully autonomous or self-driving, “driverless” taxis and public transportation.) Those services could be provided by the private and public sectors.

R&D

- Development and research of new and existing medicines.
- Developing technology.
- Development of molecular treatments.
- Development of diagnostic methods.
- Development of functional foods.
- Development of therapeutic cosmetic products.
- Development of biologically active natural substances.
- Developing and mobilising platforms for health monitoring, control, and prevention that provide healthcare providers with real-time information on patient behaviour.
- Developing interactive application platforms and devices like bracelets, mobile applications etc. (gives real-time information e.g. about training, physical measurement, pain reduction, and real-time analysis to users and clinicians health monitoring, patients’ social networking, patient sleep, nutrition, leisure, such as neurological, cardiac, apnoea and sleep monitors and mobile health: covering, preventing, diagnosis, monitoring and patient status to better diagnose, target medication, reduce adverse drug reactions, and meet others health needs of older people, and so on.
- Developing mobile devices for monitoring of vital signs.
- Developing cognitive learning games.
- Developing advanced connectivity solutions and applications that connect seniors with caregivers and social service providers.

- Developing a view to the room via smart devices in order to create and improve interaction situations (e.g. smart TV).
- Developing much more AI solutions.
- Utilising the possibilities of virtual reality.
- Developing solutions to help the memory.
- Researching and developing testing methods for computer systems.
- Creating infrastructure for big data and knowledge.
- Developing wearable devices.
- Creating digital cognitive training games.
- Building big data to help to prevent and predict diseases.

Other suggestions

- One should start using assisted living technology at a younger age in order to get used to assisted living technology.
- There should be innovative knowledge management.
- One should aim to guarantee the security of information and/or quantum computers.
- Target should be in the integrated technologies.
- Social and health care services should be integrated.
- There should be mobile education centres.
- There could be “One shop-stop” for information concerning silver economy and funding and financing.

The list of the companies, incubators and other organisations related to the senior economy in different Osiris countries:

Denmark:

Networks and clusters:

- The Medtech Innovation Consortium(www.mtic.dk)
- WelfareTech (www.welfaretech.dk)
- TUCV (www.tucv.dk)
- Care Ware(www.careware.dk)
- SundVækst netværket (www.startvaekst.dk)
- Danish Health Tech (www.danishhealthtech.dk)
- CareNet(www.carenet.nu)
- Danish Care (www.danishcare.dk)
- DokkX (www.dokkx.dk)
- AAL-network and conference. (www.all-europe.eu)

Knowledge research and institutions:

- Universities in Aarhus, Copenhagen, Aalborg and Odense
- VIA University College
- SoSU-schools (vocationalschools)
- GTS-institutes

Estonia

<http://www.medendi.ee/> Provides home nursing services,

The volunteer gate is managed and coordinated by the strategic partner of the Estonian Ministry of the Interior in the field of volunteering in Kodukant <https://vabatahtlikud.ee>

Residential institutions are commercial enterprises that provide nursing home services.

<https://sudamekodud.ee/>

Counselling for the elderly Counselling for Advocacy Koduteenused Ownership replacement Service
Daycare service for elderly persons with memory problems Day Service for Senior
Sotsiaalvalveteenus Catering General Nursing Home Service.

Finland (Häme and Uusimaa regions)

- Linnan Kehitys Oy, Hämeenlinna (We have active contacts with the entire property development field, including real estate investors, construction companies, designers, and other experts. We provide you with consultation and expert services to help find the most suitable operating environment for your business.)
- Forssan yrityskehitys Oy, Forssa. comparable to Linnan kehitys Oy
- YritysVoimala, Riihimäki and Hyvinkää (comparable to Linnan kehitys Oy)
- HAMK Smart Research Unit Hämeenlinna:
A dynamic environment for applied research, development and innovation services supporting business enterprises, wellbeing organisations and everyday life in their digitalisation and development of service systems
- Keuke is a local development company that helps companies in Central Uusimaa to develop and grow
- Novago Business Development Ltd locates in western Uusimaa
- ProAgria
- Spinno Enterprise Center
- Laurea the university of applied sciences, its fields of expertise in RDI activities are holistic health and well-being, coherent security, service innovations and business models, entrepreneurship as well as pedagogy.
- Hyria Education, Hyvinkää
- Tavastia Education Consortium, Hämeenlinna
- NewCo Helsinki: Business Advisory Services, Startup services
- The University of Helsinki
- Aalto University: research is concentrated around seven key areas combining four core competences in the fields of ICT, materials, arts, design and business together with three grand challenges related to energy, living environment, and health.
- Academy of Finland: The Academy of Finland produces high-quality science policy analyses and other material and enhances the use of knowledge about science in science policy decision-making.
- Business Finland supports companies in their steps to the international markets, Helsinki
- The Finnish Innovation Fund Sitra, Helsinki

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