



NEW INNOVATIONS FOR SENIOR CARE

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Abstract

The population of Europe is ageing. This phenomenon is a major challenge for the society, but it can also be a great opportunity for business and economy. The EU project called “Silver Economy” focuses on developing strategies related to population ageing, mainly by means of special technology services. These services generally aim to support well-being through health monitoring, robotic assistance, electric mobility or sport activities, including health tourism, green care and web-based home care solutions. Nowadays, innovation developers focus on solutions for elderly people. Economic sectors involved in innovation and development want immediate strategies and clear visions for the next decades. Health and social care, health services, self-health management and senior tourism all require ready models with smart innovations. Currently, there are two main dimensions existing parallel within the field of technologies supporting elderly people. One is focusing on homecare and independency, whilst the other is concentrating on nursing solutions in senior homes. Despite their different approach, the two trends have one thing in common: they are both facing a major innovative technological development.

KEY WORDS: silver economy, technological innovation, elderly care, village lab, matra medical, Parádsasvár.

Introduction

Research on the significance of silver economy is a current issue in the EU. According to the demographic indicators of the EU countries, it is clear that there is a huge market segment with a currently unexploited potential (EC 2015). In the case of elderly people, the right to well-being is just as significant as in case of other segments. The term “silver economy” refers to the economy of the 50+ age group, including all their economic activities, products, demands and expenditures. Up until about a decade ago, products and services targeting the 50+ age group were generally neglected, except for a few companies especially focusing on them. After 2008, the economic crisis made experts realise that one of the most stable consumer group is that of the pensioners, who have a predictable income. By now, it is also clear that the elderly population is not a homogenous group of pensioners (Zsarnoczky 2016a). Age is a main distinctive feature: there can be decades of difference, which means that we can talk about “younger” and “older” elderly people, and these groups can be further divided into several sub-groups. It means that even within the senior demographic group, we can talk about generation differences and special characteristics, related to the age of the elderly. Further important differences come from gender, cultural background, acquired skills, life experience or health status.

International demographic forecasts (OECD 2016) show that the human population is constantly growing. Taking into account the current indicators, it is clear that the number of elderly people and women are increasing,

and due to the improved life standards of developed countries, the ratio of old people within the age group of senior citizens is also expanding. As a result of this phenomenon, the developed world has to face a major challenge caused by the fact that the reproductive performance of the population is below the replacement level (i.e.: the number of deaths is higher than the number of new-borns).

In response to the challenges of the “greying century”, new scientific fields have emerged. In gerontology, there are important researches going on in order to have a greater understanding of the biological processes related to ageing. These examinations aim to find solutions for the expansion of quality life of the elderly and try to find innovative technological novelties to enhance the life standard of senior people. Ageing and death are unavoidable parts of all life on Earth – however, with the development of human knowledge and science, we are the point where we can re-consider the meaning of these words.

Research method

My research focused on the increasing impact of senior economy on technological innovations and services. Within my qualitative primary research, I took surveys among senior club members in North America and in the EU and I also interviewed managers of European health and social development companies. The questions focused on the best practices of elderly care and the experiences of the interviewees. During my quantitative secondary research, I used public databases to examine the relations between demography, economic

developments and elderly care services. My hypothesis is that senior people are open towards innovative and creative senior care solutions. As a result, I aim to define the role and weight of senior care sector in relation with new technologies, living lab projects and open services in the European Union.

My research provides a novel approach to the subject and offers further opportunities in the economic development; by examining how much senior people are willing to accept new and creative healthcare solutions, stakeholders of the sector can gain broader understanding of the field.

Technological revival for elderly people

There are thoroughly documented medical researches going on worldwide related to the elderly. The science of gerontology examines the chronological changes in human life processes and aims to define the characteristic principles of ageing. Within gerontology, geriatrics experts focus on the health issues of senior people; in summary, geriatrics refers to preventive, curative and rehabilitation medicine. It is of key importance to understand the chronological changes in human life processes that affect everybody equally. According to gerontologists, the ageing of the body is a normal biological process, not necessarily accompanied by pathological lesions or diseases (Czigler 2000). This means that there is a so-called “healthy ageing process”, and that elderly people not necessary get sick (Halmos 2002). However, the biological processes of natural ageing increase the vulnerability to diseases and accidents. These facts are important because it means that there is a theoretical possibility to develop a model for successful ageing (Fig. 1). The ageing process and life expectancy of a person depend on several factors like hereditary factors, environmental impacts, personal lifestyles developed in younger years, behaviour, social status, emotional and cognitive development, moral and ethical values and the accessibility to quality free time. (Imre 2007).

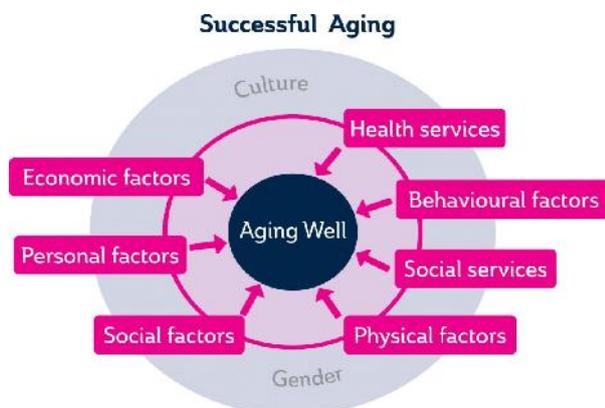


Fig. 1. Successful Aging

Source: Martin Zsarnoczky (Zsarnoczky 2016b)

The most important results of gerontology research are:

- human life expectancy can be expanded up to 150 years, of which around 30 years can be achieved by healthy lifestyle, genetic modifications and implant technologies;
- intellectual performance can be enhanced by chemical, psychological and psycho-biological methods;
- the defensive-protective operation of the immune system can be influenced and modified by targeted dietetic programmes;
- the role function of elderly age is transforming, but there is no general pattern of ageing, because diseases affect life quality.

Based on the achieved research results, elderly people are gradually starting to realise the importance of a healthy lifestyle. The willingness to live longer will motivate them to take actions, and there is a tendency among them to open up towards regular physical activity and physical-emotional-intellectual harmony, and as a result, a higher level of empathy will emerge towards them (Ángyán 1999).

For the elderly, the current economic and social processes represent a huge “smart” change of their known world. The constant changes in their environment forces senior citizens to face new challenges every day. The media is full of news about new achievements of technological innovations, the new results of the digital revolution and the speeding development of biotechnology. Thanks to the latest developments in information technology, after smart houses, the newest projects are focusing on smart cities. Of course, these developments are not only important for the elderly: they offer safe solutions that can have a positive effect on every segment of the society. For senior people, safety does not only mean personal security, but also includes the reliability of the basic necessities of life like the steady operation of utilities, food safety and reliable health services. The top priorities are social security, reliable social services and safety from helplessness and natural disasters (Zsarnoczky 2016c).

Smart solutions, Living Lab models

The improvement of social well-being is one of the top priorities of today’s world. Accordingly, companies produce their products and services based on the preferences of the consumers. Involving the customers into the innovation and development processes is of key importance because it helps to explore common demands, thus enabling the creation of competitive products. In the past times of closed innovation, companies had monitored the development processes and results; know-hows and innovation technologies were developed within a closed system until the new product was released to the market. This trend started to change in the 1980’s with the emerge of the personal computers, when developers realised the importance of direct and instant customer feedback in order to develop user friendly and easy-to-handle products (Bødker et al 2000).

Today, the principles of open innovation dominate the market of innovative developments. The concept of open innovation originates from companies that were able to successfully integrate their development activities with other external innovation ideas and technologies. At first, the initial goal was to achieve higher economic profit; today, the new solutions can also guarantee constant market presence (Chesbrough et al. 2006). The most important novelty of open innovation is the knowledge base it uses. In the case of the closed innovation model, the assessable knowledge of users was hardly accessible. For this reason, customer feedback was not a reliable source of information for the big companies, and thus taken into consideration as a possible risk. Open innovation, however, operates with an open knowledge platform, based on the widespread and high level knowledge of numerous stakeholders, and even the most successful R&D companies tend to rely on open external knowledge resources (Chesbrough 2003). One of the most common and popular forms of open innovation platforms is the so-called living lab, a term that refers to an open innovation ecosystem. Within this ecosystem, experiments and creative development take place in real life, with the involvement of end users. The new innovative ideas, products and services are developed with the joint collaboration of researchers, end users, funding companies, universities and public authorities (if necessary). Beyond the enhanced creativity, living labs are useful because the end users provide direct feedback for the marketing experts of the participating companies about the market reception of products, services and business solutions. Real life end users (Følstad 2008) are the best possible testing environment, offering the most trustworthy market survey results. Because the majority of product/service testers are volunteers, it is in their own interest to actively participate in the testing. Thus, their direct feedback is less biased than the previously used method of public polls. The most important advantage of such user-led-innovation is the inclusion of consumers in the company processes (Von Hippel 1978).

Several international surveys (ENOLL) have proven that the living lab concept is applicable not only in the case of large companies but also in the case of SMEs (Vanhaverbeke 2012). As of today, it has become a “fashionable” trend that beyond product development, small companies also include their end users into the process of branding, marketing strategy development and production. Experience gained through “learning by doing” has massive benefits for both sides (Voss et al 2011).

Micro-and small businesses usually operate in local communities, where the collaboration between similar companies generally has more benefits than threats to their success. Within the frameworks of an open innovation chain, local businesses can jointly develop new products and services for the global market, whilst sharing the costs and risk factors. By doing so, the first stakeholders to receive the profits will be the local communities involved in the development process.

Among the European living lab models, a Finnish example is considered to be the best practice. Prizztech Ltd is an association of non-profit organisations in Satakunta region, Finland. Their living lab project, focusing on elderly care is implemented with the participation of three Finnish regions: Satakunta, Tampere and South-Ostrobothnia. Further project partners are Pori Regional Development Agency Ltd (POSEK), South-Ostrobothnia Health Technology Development Centre (EPTEK) and Tampere University of Applied Sciences (TAMK).

The jointly established organisation aims to support the economy of the region by providing counselling and help to regional businesses, with special priority given to developments and investments in the fields of energetics and industrial technologies. Beyond the management of regional start-ups, their business model also includes a mentoring programme that provides unique opportunities for small development companies.

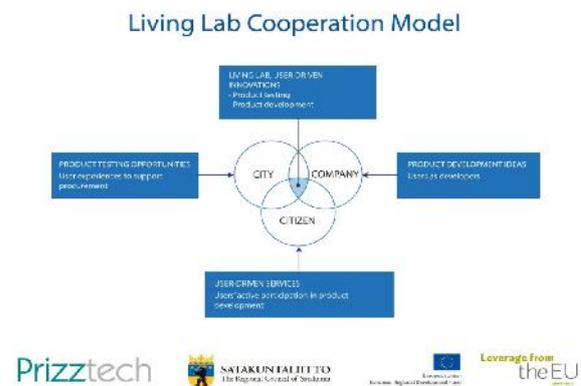


Fig. 2. Living Lab Cooperation Model
Source: Niina Holappa, Prizztech Ltd.

In Finland, special priority is given to the sector of elderly care. With the number of senior citizens increasing, the workload related to the elderly is also rapidly growing, resulting in the expansion of the workforce employed in the sector. With the number of available workforce unable to follow the increased demand, it is a reasonable choice to reach out for technological solutions. In Pori and its surrounding cities, the state-of-the-art elderly care technological novelties are tested at institutional scale. The products - distributed free of charge for testing purposes – are tested for 2-6 months; after the testing period, the product is further improved based on the feedback of the elderly and the nursing staff. After the thorough analysis of the testing period, tailor-made solutions can be developed for the homecare sector and elderly care institutions. Another important advantage of the system is that the aforementioned testing method not only allows the better exploitation of human resources and enhances the quality and effectiveness of services, but also assures a higher standard of end user satisfaction by offering tested and examined products and services to the customers. Currently, the following projects are being tested within the frameworks of the Living Lab system: Stella Kotipalvelut Ltd - locating bracelet, Sportevo Ltd - Seniors service, First Link Ltd -

NetSpot Smart Hub for iPads, VideoVisit Ltd - video call service, Viasec Ltd - safety system.



Fig. 3. Living lab testing process
Source: Niina Holappa, Prizztech Ltd.

The key to the success of the Finnish example – which received the European Union Regio Starts Award in 2013 – lies in the growing demand and state-of-the-art innovation research. Of course, the successful process requires an open minded approach from business and private sector stakeholders equally, so that they can recognize the advantages of the developments. This development model is also cost-effective: there is basically no “waiting time” for a product to enter the market: thanks to the testing period, prototypes are available for the end users instantly. Prizztech Ltd has a key role in the model: they manage the administrative background of the whole process, i.e.: organisation and analysis of testing, preparation of contracts and assisting in the communication between the partners.

In the European Union, another state-of-the art senior care project is being implemented in Hungary that also exploits the international migration of the elderly (Illés 2013). The unique investment uses the benefits of the living lab methodology. The project is located in Parádsasvár, a settlement in the nature reserve of the Mátra mountains, 100 km from the Budapest, the capital city of Hungary. The MATRALAB program of MATRA Medical Ltd. started in 2011; within the frameworks of the project that aims to earn worldwide recognition, there is a great emphasis on the continuous dialogue between community leaders, local people, investors and local authorities. Between 1708 and 2008, the mountain settlement of Parádsasvár used to live off artisan glasswork production, but due to the global economic crisis, its main income resource was shut down after 300 years. Whilst searching for a new livelihood, the local people had started a bottom-up incentive that aims to transform the village into a complex healthcare, nursing and rehabilitation health tourism destination for senior people.

Aiming to achieve a world-class level, the spatial configuration of the settlement had been re-designed, including a new settlement centre, connected settlement sections, a new recreational park and tourism developments. It is important to note that although the village’s main livelihood previously had been industrial scale glassware production, tourists were also attracted to the area by the scenic location and the vicinity of tourism routes. This tradition of tourism in the settlement played an important role in when policy makers decided to develop health tourism and medical services instead of reviving the glassware industry in the area.

At the beginning of the project, the investor group had a vision of a village lab development similar to the existing city lab projects (e.g.: the Maastricht citylab). The first step of the planning was the creation of an asset inventory, using settlement marketing tools and mind maps. As many settlements were in competition for the project, the exact location was chosen only after the analysis of the settlement asset inventories. Being a development specialising in senior health tourism, the natural surroundings of the project area was of key importance for the ROYAL PARK RESORTS project, which aims to integrate a resort-type health tourism destination into the everyday life of a village. Furthermore, great emphasis was put on the development of the local and newly settled community; another key factor was the implementation of a local food chain system. Parádsasvár and its surrounding settlements are considered as a curative medical and mineral water destination, thanks to the high quality thermal waters and more than 10 mountain springs in the area. The use of locally produced food and local water not only supports the local communities, but also contribute to the protection of the habitat by minimising environmental stress caused by transportation. The ROYAL PARK RESORTS project is planning to implement 5 separate development phases in different areas of the settlement. In total, a maximum of 250-300 apartments will be built for health tourism, elderly rehabilitation, sport rehabilitation, senior apartment home and senior home purposes. During the planning process, special emphasis was put on the factor that the new buildings would visually fit into the existing settlement structure. It was a significant challenge to bridge 10-15 m height differences on the mountainous terrain; however, state-of-the art solutions guarantee that even the mountains and creek banks can be reached easily by the guests of the resort.

The development project, based on two unique ideas is a great example of innovative and creative thinking, desperately needed in the healthcare and senior care sector. Senior care is a sector that – despite many individual differences - eventually everyone gets involved with. It is not clearly predictable whether the individual and tailor-made solutions will prevail within the homes of senior people or in special care facilities; but these novel ideas indeed are great incentives towards the improvement of the well-being and dignity of senior people.

Results

My research is based on a group breakdown of my own idea. Of course, segmentation by life stages is only one option among many grouping possibilities. Due to the fact that we spend at least one-third of our lives being senior people, there are numerous further in-depth research opportunities in the field.

Age group	Life stage	Main characteristics (statistical majority)
51-64	Mature	Married Very active social actor Large household Large income (one or multiple resources) Medium disposable income
65-74	Young-old	Married Active social actor Medium household Multiple income resources Medium disposable income
75-84	Middle-old	Married / Single Follows social processes Small household One resource of income Large disposable income
85-94	Old-old	Single* Follows social processes Independent household Large disposable income <small>*usually female</small>
95+	Very old	Single* Passive social actor Outsourced household One resource of income Medium disposable income <small>*usually female</small>

Fig. 4. Age groups of senior people by life phase
Source: Martin Zsarnoczky (Zsarnoczky 2016d)

Their health condition highly affects the life quality of senior people. Scientific fields focusing on the elderly have many different definitions of the human age. Chronological age refers to the number of calendar years lived by someone, while the biological age of a person is defined by the measure and status of their biological processes. Another aspect can be the psychological age, which is measured by one's own subjective age perception (Hidyné 1989). Taking into account all different aspects, a person's age can be defined in many ways from different perspectives. According to studies, elderly people generally feel 10-15 years younger than their actual chronological age. When comparing themselves to other people of the same age, they generally think they look better and have a more "youthful" mind-set (Rutishauser 2005). Within the senior age group, "new" pensioners are usually more careful, more responsible and more forward-thinking. They give particular attention to healthy eating, regular physical activity, preventive healthcare, and thus they tend to be healthier and less susceptible to diseases.

Data facts:

- Number of fully completed surveys: 79; 53% of the total of 150 filled questionnaires
- Gender ratio of respondents: female:67%, male: 33%
- Ranking of respondents' countries of origin (1-5): Hungary, Austria, Germany, Canada, USA. Ratio of EU countries among respondents: 76%.
- Age of respondents: the majority fell within the age group 51-64 (51%), followed by the 65-74 age group (37%). The 85-94 age group was represented by 1%, and no respondent fell into the age group of 95+. The eldest respondent was a 93 years old Canadian female of Hungarian origin.

- Level of education of respondents: 1% had a PhD, 34% of them had graduated from higher education (university or college), 41% had finished secondary education, 19% had graduated from VET education, while 3% had finished primary education, and 2% had not finished any school at all.

- Marital status of respondents: married and lives with kin:44%; divorced and single: 19%, widow(er), single: 16%, single female: 9%, unmarried and lives with partner: 5%, single male: 3% , divorced and lives with another partner: 2% separated and single: 1%, widow(er), lives with partner:1%.

- Latest job of respondents: miscellaneous intellectual activity (without higher education degree): 35%; employment related to higher education degree: 27%; skilled worker (non-agriculture): 10%; service provider: 9%, intellectual freelancer: 5%; high level management (above head of department): 3%; lower level management (below head of department): 3%; farmer (agriculture): 2%; trader:2%; mid-level management (head of department):2%, trained worker:1%; craftsman (manufacturer): 1%

- The survey also examined how many times the respondents' discretionary income would allow them to travel abroad at 100EUR daily subsistence rate, based on their own preferences (A: longer than 1 week, B: minimum 1 week, C: minimum 3 days, D: less than 3 days). The answers were as follows: 51-64 age group: A: 9 B: 10 C: 4 D: 13; 65-74 age group: A: 8 B: 9 C: 12 D: 11; 75-84 age group: A: 7 B: 5 C: 7 D: 3; 85-94 age group: A: 1 B: 1 C: 0 D: 0.

Analysis of results:

According to the results of the survey, the following factors are of key importance for the elderly (listed by level of importance):

1. avoiding helplessness;
2. fear of solitude and loneliness,
3. environmental awareness,
4. conscious food consumption,
5. food safety,
6. avoiding dementia and other diseases,
7. safety, living in a protective closed system,
8. sufficient medication and healthcare,
9. digital society inclusion,
10. seeking other forms of enjoyment due to decreased sexual activity.

According to demographic forecasts, by 2050, the world population will reach 9 billion, its estimated sustainability limit. This not only calls for the need to make vegetarianism fashionable; people need to understand that there will not be enough meat for everyone. For senior people, the quality of food is of key importance: they prefer food that had been produced with higher production cost but with better resource-effectiveness. They prefer local products over imported food; eat less meat, drink less bottled beverages and water and tend to choose organic/bio food over mass production meals. Their absolute favourite is locally produced food.

According to the survey, people with higher level of education tend to worry more about environmental problems and climate change. The elderly are not willing to participate in the competition for resources. They see

today's world as a new age in which wars and economic crises follow each other. In this new era, the work of their lifetime seems to be wasted, making the elderly often feel frustrated. Clean water, healthy food, fresh air, easily accessible places and services, a reliable daily routine, pleasant natural surroundings and the vicinity of nature reserves are of key importance for almost every senior people. When asked about poverty, almost all respondents were curious about how the younger generations will share the available natural resources.

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RECEIVED: 16 October 2016

ACCEPTED: 10 May 2017

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