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**Co-Creating and Orchestrating
Multistakeholder Innovation**

20. Co-creation in the development of an internationally recognised digital service platform for seniors

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ON THE FUTURE OF THE HEALTHCARE AND WELLBEING SECTOR

The population is aging and people are living longer. The size of the elderly population is growing dramatically everywhere in the world. Healthcare systems have to grapple with rising costs, insufficient care staff and increasingly common chronic illnesses – for example, cases of type 2 diabetes are expected to increase by 20% in the coming ten years (Business Finland 2019). This will cause many challenges for our society, such as insufficient public services and the need for new, cost-effective service models for our graying population. How can we support the elderly to cope with their daily challenges at home?

The costs of producing health and social services for the elderly are greatly increasing. There are currently no cost-effective digital services on the market to promote comprehensive wellbeing for the elderly and help them live active and safe lives at home. As Finland ages, it is important to protect the health and wellbeing of the elderly as well as their ability to function. Independent, enjoyable life in a familiar and safe home environment promotes wellbeing. Good mental and physical health, high ability to function, varied diet and maintaining social connections are among daily challenges for the elderly. (City of Espoo; Lehto & Leskelä 2011). At the same time, ensuring the ability to function while preventing diseases and treating them early reduce the demand for services and cut associated costs. (Finnish Institute for Health and Welfare 2019)

The use of wellbeing technologies and digital services has increased significantly in the healthcare and social services sector in the 2000s (Sitra 2020). People also feel more responsible for maintaining their own health and wellbeing and increasingly want to participate in promoting and caring for their own health. This is already possible thanks to the rapid adoption of mobile phones, smart devices and social media along with digital health devices used by healthcare providers (Business Finland 2019). Digitalisation is already a reality in services and social interaction. As technology develops, we will be able to make more functions automatic

while providing human interaction remotely or in a virtual environment. This will change the way healthcare and social services are produced and how they work, while making them more cost-effective.

The production of health services has already begun to shift towards remote connections. Remote treatment, virtual treatment and e-healthcare are defined as audiovisual care services provided through information networks or other technology in which a customer living at home connects with a healthcare professional to discuss matters relating to health and wellbeing. Remote visits are planned based on the needs of the customer. It is possible to monitor the health of the customer in remote care by connecting various instruments, devices and sensors which measure the patient's vital functions and activity. Portable or wearable health and activity monitors have become common, and the increased information enables more personalised and preventative care. Many homes already have telemonitoring devices which track health and activity in real time and transmit the results to a service provider.

Automated medication dispensers connected to medical alert phones or wrist bands are one example of at-home telemonitoring. Another might be mobile apps that use sensors to track blood pressure, blood sugar, ECG and blood oxygen levels, and then send the information to a cloud service for real-time comparison with previous results and other patient information. Sensors and wearable devices measure vital functions, sleep, activity and alertness. Wearable technology has often been called one of the most significant wellbeing applications of the Internet of Things. Wearable devices can be worn on the wrist (smartwatches and activity bands), hands, feet (sensor-enabled shoes), or they may be incorporated into a shirt, pants or glasses (Vähäkainu 2018). The data gathered by these devices are then transmitted to healthcare staff through a digital system (e.g., electronic health record, EHR). During a remote visit, a healthcare professional can check that ongoing treatment is processing smoothly based on the monitoring data and talking to the patient. They can also monitor the patient's overall health, medication and daily challenges and provide additional instructions and advice if necessary (Lempiäinen 2019). In many cases, such a digital care pathway can replace doctor's visits as long as actual medical treatment is not needed. People can use digital applications and personal devices to gain real-time information on their health after which they can be directed to find more information or seek out care digitally. (Laurea 2020, Sitra 2020)

It has been predicted that by the year 2025, more public and private healthcare organisations will have adopted remote treatment devices and platforms to provide services to their customers "anytime, anywhere". Healthcare costs will be focused more on prevention, diagnosis and monitoring of illnesses and less on their treatment. (Business Finland 2019)

During this spring and the corona pandemic, practically all non-urgent care has moved to a virtual platform, particularly in the public sector. A possible silver lining to the coronavirus might be that it has enabled healthcare and wellbeing organisations to test various remote, virtual and e-healthcare solutions in care, advice and guidance services. This will speed up their wider adoption to a broader customer segment.

In the future, healthcare professionals will be able to use artificial intelligence, big data and predictive analytics to help diagnose and choose the right treatment for patients. This could mean that the data collected by personal sensors and devices would let the system identify abnormalities in the customer's behaviour, enabling early detection of risk factors and possibly preventing severe health incidents and diseases (Vähäkainu 2018).

Cost-efficiency pressures along with advances in artificial intelligence will also make the use of robotics more common. Care will be provided in the home by robots, enabling the elderly to stay at home for as long as possible. Rehabilitation robots already exist to support exercises aiming to restore upper-body motor function or the ability to walk, and so far, user experiences have been promising. Rehabilitation robots help patients

exercise correctly, which usually requires the assistance of a physical therapist. With the help of rehabilitation robots, a single therapist could help several patients at once. (Vähäkainu 2018).

Technology, artificial intelligence and robotics will release care staff from routine tasks to focus on the patient connection, which will let them treat older adults as fully-fledged individuals, not just objects of care. Together with artificial intelligence algorithms, robotics increases opportunities for self-care while supporting living at home. Diagnostic applications using machine learning algorithms are rapidly becoming a reality through research institutes and universities. Artificial intelligence may provide a second opinion on a diagnosis, or it could be used as a tool for early detection and more detailed diagnoses. As a diagnostic tool it is effective and cuts costs for patients, doctors and hospitals. Artificial intelligence is already being used to detect cancer. (Vähäkainu 2018, Business Finland 2019). On the other hand, artificial intelligence and digital platforms let the client transform from a passive recipient of information to an active agent of their own treatment and its monitoring. Compliance with care instructions will be monitored interactively together with the customer through digital services and applications. The applications give feedback and personalised care advice to the customer based on the monitoring. (Sitra 2020, Laurea 2019). We should embrace robotics and various digital methods in remote care and care work training.

The emphasis on independent health and wellbeing monitoring as well as digital services require new skills and attitudes towards technology from both clients and experts. The new solutions for promoting the health and wellbeing of the elderly and supporting their life at home are integrally connected to technology and smart solutions. Technology and digital platforms can already support the wellbeing of the elderly in terms of exercise, nutrition, social connections, remote rehabilitation, promoting the ability to function, self-monitoring in the self-care of chronic illnesses, promoting mental health, reducing loneliness, supporting memory functions, ensuring a safe home environment and managing medication (Kaasalainen & Neittaanmäki 2018).

However, a lack of awareness of new services, devices and products, or hesitancy in adopting them, continues to be a problem. The lack of digital skills among the elderly hampers the adoption of new services. An additional challenge is the fact that digital services are spread around different websites and consequently difficult to find. In the future, we will need service platforms and portals which provide access to several services and products for different needs in a single visit. Digital wellbeing services and wellbeing technology, artificial intelligence and robotics are cost-effective solutions for the future. They will help the elderly and their family carers live safe, easy lives in their homes while promoting their wellbeing and supporting the work of public and third-sector organisations.

The Seniori365.fi platform, developed in 2014 during the InnoEspoo project which was funded by the European Social Fund, sought to tackle the challenges of first-wave digital services by providing access to several services, products and information on a single visit.

ONE-STOP ELDERLY SERVICES

During the InnoEspoo project, the Seniori365.fi service was developed together with Espoo-based seniors, experts and students through service design and innovation theory methods. After the project ended in 2015, Seniori365.fi continued as a service platform maintained by Laurea University of Applied Sciences. Laurea students from different study programs were in charge of the platform's content creation, maintenance and development. It was an excellent learning environment for students. In addition to creating content and developing new functions, students presented the platform at hundreds of events and places both to

prospective service providers and end users. While working on Seniori365.fi, students learned about the daily lives of the elderly in practice as well as the products and services that promote health and wellbeing.

In spring 2018, Seniori365.fi became a part of the European Social Fund (ESF)funded TEKNO project and focused increasingly on building awareness of health and wellbeing technologies as well as companies and expertise in the field. Seniori365.fi was also connected to another Laurea innovation, the Teknologialainaamo, an initiative to lend wellbeing technology products primarily to elderly. In the end of 2018, Teknologialainaamo joined the Seniori365.fi platform as an independent component. This improved awareness of health and wellbeing technology among the users and network of Seniori365.fi while promoting cooperation with companies in the field. (Karlsson 2019).

The development of Seniori365.fi was based on the idea that as much help for promoting health and wellbeing of the elderly as possible would be available from a single visit. Therefore, the Seniori365.fi website featured providers of wellbeing and home assistance products and services, such as cleaning, repair, meal, IT and health services, assistive technologies as well as wellbeing technology products and services. In addition, the service featured articles on wellbeing as well as instructions for exercise, nutrition and promoting wellbeing and health. It compiled local events intended for the elderly and had easy links to access the service websites of various institutions. The activity section featured links to newspapers, online players of television channels and games. The service published digital stories by seniors, cooking recipes, a discussion forum and a nutrition blog as well as exercise and relaxation videos guided by physiotherapy students. There were sub-pages dedicated to family carers and volunteers. Safety issues for the elderly had their own page which was easy to access. Seniori365.fi was a specialised search engine for seniors (Karlsson 2019).

AN ACCLAIMED AND APPRECIATED SOCIAL INNOVATION

Seniori365.fi won the Design for All Foundation's Best Practise 2014 competition in Paris in March 2015. In October 2015, it won the social innovation category of the European Women's Invention, Innovation & Enterprise Network competition in London, and the gold medal in the co-design category of the Japanese International Association for Universal Design. In May 2018, it was voted into the top three Living Lab workshops in an open social poll organised by the European Network of Living Labs, and won the bronze medal in the category of most popular development environment. In autumn 2018, Seniori365.fi was among the top finalists for the Quality Innovation Award organised by Laatukskus Excellence Finland.

SENIORI365.FI, A DIGITAL SERVICE CREATED AND DEVELOPED BY STUDENTS IN COOPERATION WITH SENIORS AND EXPERTS

The Seniori365.fi service was developed together with Espoo-based seniors, experts and students through co-creation methods. The three cornerstones of the development were the service design process and tools created by Stefan Moritz (Moritz, S. 2005), Laurea's Learning by Developing (LbD) model along with the method of Gijs Van Wulfen (Wulfen 2011, 2013). Figure 1 describes the innovation process model which was created by combining these two models and applying the LbD model for students.

At Laurea, students primarily learn through development projects organised in cooperation with working life organizations which employ the LbD model. In the LbD model, participants learn in interaction which aims at creating new expertise in cooperation from planning to assessment. The model is based on five concepts: creativity, authenticity, partnership, experiencing and research orientation.

STAGES OF DEVELOPING SENIORI365.FI

The figure 1 maps the stages of the development process. The development process and map template were designed based on van Wulffen's model. Moritz's toolkit and methods were used at various stages of the process. The van Wulffen model answers the question "what should we do?" and the Moritz model, "how should we do it?" In addition, the LbD model for students was employed at several stages of the process.

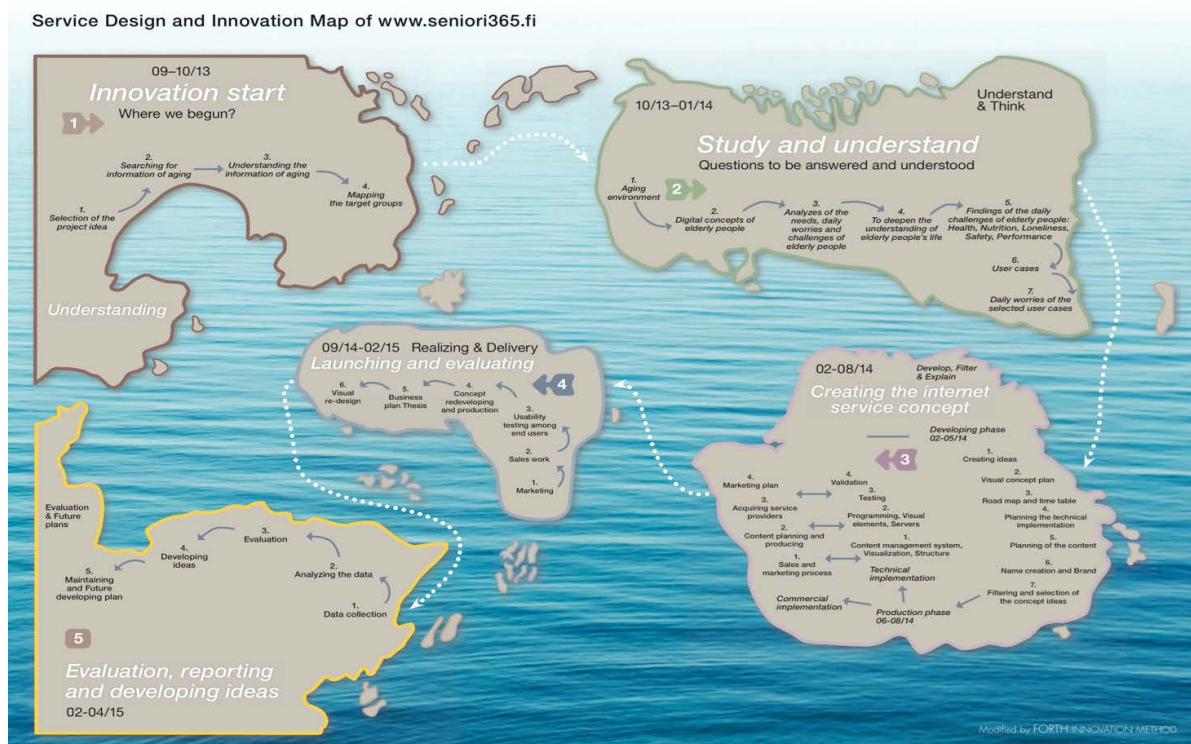


Figure 1. Stages of the Seniori365.fi development process.

In the first stage, "Innovation start", the starting point of the development process was set as the City of Espoo's *Elinvoimaa ikääntyville* programme and the kinds of services and products the elderly in Espoo might need. This led participants to explore ageing as a phenomenon along with existing digital services aimed at the elderly. One of the core ideas was using digitalisation in service development.

In the second stage, "Study and understand", events and workshops were organised to compile daily challenges and needs – both conscious and unconscious – among the elderly using co-creation processes. The methods included group and in-depth interviews, storytelling and observation. User profiles were created based on the collected information. Participants then thought about daily challenges that would be specific to each profile to create a visual concept of the service being developed. The service idea was tested among seniors and experts, after which the technical and commercial development of the service could begin.

The third stage, "Creating the internet service concept", was divided into three major sections: developing the visual and technical concept, implementing the website and performing user testing, and setting a schedule

for the project. During concept development, service paths complete with contact points were designed for several user profiles. Their goal was to help the developers understand how seniors would use the service and what type of content was needed. In the implementation stage, a technical student team created the service platform and its functions, while a commercial student team recruited service providers, created content, planned presentation events for the autumn and designed marketing materials.

The fourth stage began with the launch of the service on 29 August 2014. After that, the service was show-cased at more than 160 events. New service providers, partners and stakeholder institutions were linked to the service. New interesting content was created and the several usability tests conducted among seniors. The developers continued to hone the service based on the testing.

At the last stage of the development process, the service was evaluated and decisions regarding its future were made. Many stakeholder groups, including users and experts from the public, private and third sector institutions found the service very necessary. As had been planned, the service supported the elderly in their daily lives while offering useful information and activities to enrich their lives. As a result, the maintenance and further development stage of Seniori365.fi began at Laurea in the form of student projects.

FURTHER DEVELOPMENT AND MAINTENANCE OF SENIORI365.FI IN STUDENT PROJECTS

For students, Seniori365.fi was an excellent multidisciplinary learning environment where they could apply their skills to the production of new service ideas and content. Studying the environments and daily lives of seniors at the start of each project gave students new insight into the future opportunities and challenges that institutions in the wellbeing sector are likely to face. Through hundreds of different service development and content creation projects, the students used various service design and innovation tools, such as the storyboard method, mind mapping, the 365 method, brainwriting, creation of customer profiles, storytelling and customer experience paths, fishbone diagrams and the Business Model Canvas (BMC). Student teams tested their proposals and concepts by visiting peer support groups for family carers, senior events as well as meetings of volunteers over the age of 65. These encounters were a positive experience for both the students and the elderly customers. The students got encouraging immediate feedback while finding new insights for further development work. Correspondingly, the customers praised the students' skills and attitude and were pleased by the attention. Improving students' understanding of digital services was a significant aspect of the Living Lab environment of Seniori365.fi. In total, Seniori365.fi has yielded more than 4,800 credits and 15 theses.

Here are some student comments about working on Seniori365.fi:

Laura Virkki and Mirja Lundgren, student project managers, hospitality management and service design
Juha Majuri, Markku Pohjanheimo, Juho-Pekka Myllynen and Oskar Grob, project team members, business management students

"Creating a digital service for seniors has been interesting and motivating. The first impression of an online service is based on its appearance, function and fitness for purpose. Working on the website for seniors generated a huge amount of competence in marketing, sales and content creation for a digital service. We could take nothing for granted. Everything we made for the service had to be created with seniors in mind. The project has been very educational. Seeing Seniori365.fi specifically from a service production standpoint gave me valuable information to develop my future skills."

"Seniori365.fi was an incredibly interesting and productive experience. I learned many new things in practice, and I got to be creative with my own development areas, which taught me to take responsibility. My team and project work skills grew tremendously, for example I learned to be sensitive to the feelings and thoughts of the other team members and to brainstorm together. The best part of the project was meeting the seniors and getting feedback directly from them. They were really excited about the website and gave us encouraging feedback."

Markus Suomalainen, Veikko Laiho and Henri Hänninen, business information technology students

"During our work in the Seniori365.fi team, we learned a great deal about the technologies in our field, such as the Drupal content management system as well as the work to maintain and develop a web site. Nearly everything we did for the service supported our studies, since we are specialising in web application development. Teamwork was the most useful part of the project, and my team and project work skills improved significantly thanks to the multidisciplinary student team. All in all, Seniori365.fi was a wonderful experience. Working on the project was great, and I believe the experience will benefit us on the labour market in the future."

Niki Sahramaa, thesis student, business management

"The project was very educational and interesting. It gave us students a chance to work for an important cause. I think the most educational part was learning to understand the challenges that the elderly face in their daily lives, and developing the service based on the needs of the customers. It was great to work on a project that was intended to really help people, and not just make a profit out of wellbeing and health."

Katja Tikkanen, Laurea supervisor for the students

Seniori365.fi gave students a versatile learning environment for socially topical themes, such as the aging population, family carers and digital communications. Increasing customer insight on the needs of the target group as well as using service design methods helped students create good new content for the website. At the same time, they gained the kind of expertise that is valued on the job market. The many different themes of Seniori365.fi gave students the freedom make more flexible choices, allowing them to find their own strengths. It's rewarding to work on a service that everyone believes in: students, users and professionals. Co-creation makes the best services, and Seniori365.fi's international awards and growing numbers of partners, users and students are testament to this.

WELLBEING PROFESSIONALS APPRECIATED SENIORI365.FI

Maria Rysti, specialist in elderly care, Social and Health Services, City of Espoo

It's good that the people in the municipalities as well as their family and friends and any others interested in elderly care could find solutions and answers to everyday questions through a "digital service market". Seniori365.fi is a good innovation for this. If you need a massage or want someone to shovel snow from your driveway, Seniori365.fi could help you find an Espoo-based service provider. The service also has digital games to give your brain a workout. It would be good if people could find information on different kinds of services in the municipality from a single website. Comparing services helps people choose the company or third-sector provider that is best for them.

Kristiina Erkkilä, development director of Cultural and Education Services, City of Espoo

Developed as part of the InnoEspoo project, the digital meeting place Seniori365.fi has proven to be a necessary service enriching the lives of many. Seniori365.fi is a wonderful complement to the services of the City of Espoo, which reduces the pressure on the City to increase its services. The design and implementation of Seniori365.fi is a perfect example of true service design and co-creation. This is exactly the kind of real-world network innovation that Espoo's innovation garden can produce at its best.

SERVICE DEVELOPMENT FOR THE ELDERLY CONTINUES

As the TEKNO project drew to a close, the maintenance and development of Seniori365.fi was also ceased due to lack of funding. The technical and functional development and maintenance of a digital service, as well as its coordination as a learning environment for students, requires resources consistently, meaning fixed costs every year.

Over the course of its five years of operation, Seniori365.fi proved to be a fantastic Living Lab experiment, which benefitted many stakeholder groups. It was an excellent multidisciplinary real-world learning environment for digital services for students, a marketing channel for companies, and for the seniors and their families who used the site, it showcased wellbeing services and products, useful information and activities to ensure a safe and healthy life for elderly living at home. It also supported public and third-sector activities for the elderly. Seniori365.fi connected seniors, their families, service providers, public and third-sector operators as well as students.

Experiences from Seniori365.fi have encouraged Laurea to continue developing digital services for seniors. While the service of Seniori365.fi is no longer being developed actively, it is however stored at Laurea. The platform can be used, for example, by developing interactive services, such as remote services for social interaction or automatised wellbeing services based on remote monitoring. One thing is certain: in the future, an increasing number of wellbeing services will be on online digital platforms.



Picture 1. The site-banner. (Source: Seniori365.fi-site.)



Pictures 2 and 3. Presenting the project. (Pictures: Seniori365.fi team)

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- Seniori365.fi
- Digital service concept for senior citizens
- Digital multidisciplinary learning environment

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WE ARE LIVING in a world that is changing at a rapid pace. Globalization and technological development are bringing about many benefits. However, the challenges we meet are often complex, inter-connected and systemic, so-called *wicked problems*. The challenges are no longer local or one-dimensional.

Addressing wicked problems requires new rules and new ways of thinking that are determined by collaboration, inclusiveness and openness. These global challenges call for updated models that both help to enhance involvement of multiple stakeholders in *co-innovation* and *value co-creation*, and help stakeholders to benefit from them.

The set of articles within this book demonstrate how such concepts as *multi-stakeholder partnership*, *co-production of research* and *participatory Research, Development and Innovation* take place in practice. The articles epitomise how new collaborations, dialogues and partnerships are being formed among academic, public and private partners, and civic society. As the described collaboration is characterised by impactful interdisciplinary and creative methodological experimentation, this publication seeks to engage a wide audience of researchers, educators, policy-makers, practitioners and others with an interest in combining collaborative academic, business and public expertise.

These articles introduce research results, methodological considerations and practitioners' experiences on multi-stakeholder collaboration allowing for and benefiting from open research, innovation and educational processes. They make apparent the wide range of practices, tools and benefits of co-creation in the context of *Open innovation*, *Open science* and *higher education*. The articles shed light on the prerequisites of purposeful multi-stakeholder partnership and collaboration in different thematic and regional contexts.