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Estonia - 45 339 km² of AOI

Plenary session 2:

New tools and functions for cities and areas of innovation

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Executive summary

From day to day the world gets smaller. On high speed. Ease of information exchange and growing amount of it destroys geographical borders rapidly and this way different countries and cities face constantly growing competition. The competition on resources, of what human is the most important, forces communities for more innovation to not only preserve but develop the living environment to offer better comfort for the citizens. The understanding of the importance of innovation gives better chance for the future and the systematic implementation of different means is helping cities, regions and even countries to get advantage in this competition. Estonia with its systematic and constant developments of innovation system shows clear understanding of its importance and positive effect on competitiveness and better life. In our case the whole country - 45 339 km² is one very good area of innovation!

Intro.

Geographical position

Estonia is a sovereign state in Northern Europe. It is bordered to the north by the Gulf of Finland with Finland on the other side, to the west by the Baltic Sea, to the south by Latvia (343 km), and to the east by Lake Peipus and Russia (338.6 km). Across the Baltic Sea lies Sweden in the west and Finland in the north. The territory of Estonia consists of a mainland and 2,222 islands in the Baltic Sea, covering a total area of 45 339 km², water 2 839 km², land area 42 500 km², and is influenced by a humid continental climate.

Digital position

With its relatively low amount of physical legacy from soviet times, Estonia has managed to move quite fast within last 25 years in its development, economic transformation and of course digitalization. Those times and geographical position in between east and west offered us a unique chance to use our knowledge synthesized from open west and so called "closed" east. By the way, in spite of this relatively closed and undemocratic east time, one very important thing - the pragmatic will to achieve more is carrying us further to better future from day to day. By now the communication between the state and the citizen is extremely comfortable and this is the thing Estonia is very proud and advanced of. Huge amount of time saved not standing in a queue in some government office because of one small paper, has given to both sides - the citizen and the state - the effectiveness we need for economic growth. This saved time can be converted into personal benefit either for family or work activities. Of course, entrepreneurs have saved and are saving time when daily routines need to be done for example with tax or customs office. Somewhat different is the thing with heavy industry and certain parts of logistics, but there we can benefit from previous digitalization processes and from high level digital knowledge amongst people.

Mental readiness for innovation

Dependent on the countries STP-s have various shareholders. Either public or private they all situate always in some kind of city environment and are always a part of social life where physical shape meets mental, including entrepreneurship. The culture in its widest meaning defines the readiness to experiment and use city environment for innovation and business testing. Legislation, traditions, education level, infrastructure, climatic conditions, standard of living and many more circumstances have their own role in innovation readiness. At the same time and actually, as innovation is a positive thing everywhere, we can talk and compare the level of experimenting readiness of different regions or countries. Taking into account previously said, Estonia can be considered one very good living lab - mentally, physically and digitally.

The cooperation between two biggest Estonian STP-s - Tallinn Science Park Tehnopol and Tartu Science Park - and other innovation agents has brought along two biggest municipalities - Tallinn and Tartu. Those cities are far more than some average innovators and taking care of their

inhabitants with either general public services or more personal ones from smart streetlights to personalized medicine. They both carry out the spirit of experimenting. Tallinn was nominated II place (Runner-Up prize) winner on 7th of November 2017 on Europe's Innovation Capital contest at Web Summit in Lisbon, Portugal. Tartu has started several large-scale *smart city* projects in housing and other areas bringing together very actively all players interested.

But next to these bigger university cities other areas of Estonia do contribute into innovation and economy with their own specific and high-level knowledge embedded and combined of course with digitalization. Either Viljandi with its cultural and industrial developments or Pärnu with wellness and spa-life. Heavy and energy industry in North-East is contributing also into energy and oil shale - our national treasure - technology sector.

In general, and even with these few examples we can say nowadays something is happening in Estonia. We are witnessing a shift - mental shift in acknowledging the importance of constant development and the profits of innovation. It seems, that we are in the beginning of this process as besides usual innovation players even politicians have started talking about innovation and added value production in different fields of life. The inner search for new and hourly growing global competition is forcing everyone - from president to simple worker - to ask, "How can I do better?".

State level is awake!

Following the overall trend there have been made some innovation fostering moves also on governmental sector during last two years. With reorganization of Estonian Development Fund (EDF) in 2016 three main activity lines got separated and this way focus got better for each activity. To take longer perspective and scenarios under more attention by Parliament, Foresight Center was created-transformed. Startup-Estonia got new perspective under the roof of KredEX (Credit and Export Fund). Investment funds of EDF were privatized.

The **Foresight Centre** is a think tank at the Estonian parliament; its tasks include analysing long-term developments in the society, identifying new trends and development avenues, and drafting development scenarios. The Foresight Centre bases its studies on a variety of possible developments and outlines alternative scenarios. In 2017-2018, the Foresight Centre is conducting three major studies:

- the future of public (e-)governance
- the nature of work in the future
- developments in productivity

The study teams include renowned experts from Estonia and abroad. For all the study projects, the Centre maps the current situation, systematizes the results of the existing studies, and conducts additional studies if necessary. At the last stage, the Centre develops alternative scenarios until 2030, and identifies which decisions still need to be made by policy shapers. This way the long run perspective is hopefully under the attention of those persons who are elected to take care of Estonia's well-being in the future.

Startup Estonia (SUE) was taken on 2016 closer to financial instruments and was added to KredEX. KredEX is a financing institution helping Estonian enterprises develop quicker and expand more safely to foreign markets, offering loans, venture capital, credit insurance and guarantees with state guarantee. With the combination of very early stages funds, Startup Estonia makes the new-economy policy in very close perspective and sync with the funds available. At the same time SUE is aimed to supercharge the local startup ecosystem in order to see many more startup success stories to come from Estonia. For that, we are working on making Estonia one of the world's best places for startups by focusing on these 4 building blocks:

- Strong ecosystem
- Smart people
- Smart money
- Friendly regulations

The funds managed earlier by EDF were privatized and got fund managers on the market rules as any other fund. Of course, it is important to mention, that funds created just two-three years ago will give effect in the perspective of 5-10 years. Nevertheless, today's full complexity and total

amount of funds available shows clear sign, that all good ideas might get funding with significantly higher chance and situation is better than ever. The structure of funds was created to cover all the stages of entrepreneurial development starting from early business-angels co-investment fund to Baltic Innovation Fund created by Estonia, Latvia and Lithuania and the European Investment Fund (EIF) with a purpose to increase equity investments into the enterprises of the Baltic States.

As a part of abovementioned SUE program's smart people cornerstone, a **Startup-Visa program** was launched. With the help of Estonian startup community, a non-EU startup founders who wish to come and be a part of Estonia and EU with it, can claim for Estonian startup-visa. Under the Startup-Visa program, a startup is defined as a business with the goal to develop and launch an innovative and repeatable business model with great global growth potential, which also contributes significantly to the development of the business environment in Estonia. As an Estonian startup, enriching and growing your company by employing foreign talent is made easier than ever through the Startup Visa program. Founder can benefit at the same time from very lively and open community, register and do all the paperwork using our famous and easy e-government systems, apply for several financial support possibilities and use other development services offered by incubators and accelerators.

In sync with the mental shift mentioned in the beginning and actually, as a good example of it, the program **Level11** was brought out just at the fall of 2017 to take advantage of Estonias very active startup life. It brings together Estonian open-minded corporations with desire to develop and agile startups, offering both the chance to learn from each other. Corporations can and have already found new angles to develop their "old" products in startupper way. On the other end young entrepreneurs can gather valuable experiences from elder colleagues at the same time trying to find and seal one of their first sales. Also, the process itself will give relatively unusual perspective for startupper - to contribute into real and existing economy not only designing the future. From scienceparking side, it is our hope, that completely new business on new technological and business model level will have a chance to appear in such a cooperation. Triple helix can get the whole new interpretation consisting of old school company, startup and science park. It will be most likely that Tehnopol will bid on inspiring solutions award on 2019. when the results of Level11 will be real.

E-residency program is comparing to abovementioned new initiatives already old. Nevertheless, being a e-resident offers you the same quality and convenience level in services for those who are not yet Estonian citizens. This is independent of your field of work, you can just enjoy all the benefits like Estonians do, practically borderless. This solution actually widens the understanding and perception of Estonia as an area of 45 thousand square kilometers of innovation.

Municipalities are not sleeping!

Tallinn, Tartu, Viljandi, Narva, Haapsalu, Pärnu - these are very beautiful Estonian cities, each has its specific high-level uniqueness. These uniquenesses make Estonian towns different of course, but the desire to be the leader in innovation unites them all, each in its own strengths. Besides the desire to innovate, there is one more trend starting to appear. The will to cooperate and help each other by combining different topics and interests has showed first signs instead of dumb in-house competition on government money. Although it might seem to outside world, that Estonia is top notch e-country, then we have a long way to run to utilize the entrepreneurial potential. Yes, to run, because we would like to have convenient, nice and comfortable life just before all other countries. That for all progressive municipalities have understood that entrepreneurship and specifically smart one, is the thing that gives local people perspective to stay, realize their ambitions and gain good life. The following examples are just some of these strivings.

Estonian Smart City cluster

Tartu Smart City Lab and Tallinn Science Park Tehnopol are in charge of **Estonian Smart City Cluster (ESCC)**, keeping up the network of nearly 50 members interested and offering different Smart City solutions. IoT based hardware, IT and Big Data solutions, all kind of sensors and energy related products can be found amongst those enterprises.

The same enterprises with variety of products are systematically networked with municipalities - one of the main customers of Smart City products and services. Regular workshops and constant preaching on new solutions have started to have an influence on city officials making decisions. The awareness of the more energy efficient or time efficient solutions in combination with a new public procurement law allowing **innovation procurements**, have started to change the culture on municipal open tenders. Smart City lab in Tartu is the leader of ESCC and focuses very tightly on educating municipalities on innovation. Of course, officials are not the only decisionmakers. There must be a political will and understanding to experiment and money resources available at the same time and place. And here is the catch - only if all circumstances are falling into the same timeframe, the innovation happens, and the job of ESCC can be considered successful till some extent. Side effect is, that positive cases in Tallinn and Tartu - a little more capable of innovating - will give the courage to experiment in other cities and regions of Estonia.

Taking part in **SmartEn Cities** project is just one of good examples of experimenting and a will to use ESCC as an innovation partner by Tartu City. In SmartEnCity, Tartu seeks to demonstrate a comprehensive approach to retrofitting outdated panel buildings according to near zero energy standards. It is quite remarkable how whole district with hundreds of flat owners have accepted the initiative offered by city government. Besides retrofitting Tartu would like to boost the liveability of the town through intelligent street lighting, biogas buses, electric car and bike rentals as well as charging stations and many other ICT solutions. Engagement of the citizens in creating a high quality living environment that inspires environmentally aware decisions and new patterns of behaviour.

Of course, selling products and services to municipalities is only one outcome of this clustering. Another and maybe even more important and future-oriented result is the cooperation in-between the companies which leads to previously unknown new products and rises competitiveness. Acknowledged fostering of combining different disciplines and products will take economic and technological operations to completely another level accompanied with the strong and permanent **change in our behaviour**. Change of behaviour will become a basis of completely sustainable business models, either for countries or companies. It is just a little more focused on company and more complex on state level.

For Estonia, the very high level of e-governance as well on state and municipal ground has saved tremendous number of workhours. This is extremely important if you have every inhabitant and pair of workhands counted amongst 1,3 million people and you do not have to waste your time on standing in line waiting for some official to receive you. You can do almost everything in communication with public authorities on that moment when it is suitable for you and not for officials.

Connected health. What? Connected to whom? Why?

Connected Health is a country-wide partnership between health-related stakeholders in Estonia, who are committed to accelerating the adoption of connected health solutions, on an international scale and on commercial terms. The cluster brings together 70+ partners, including 43 companies (start-ups, health IT, medtech, biotech, and pharma), R&D partners (universities and technology competence centres), health and wellness service providers (hospitals, GPs, occupational health, spas, fitness and sports), patient organizations and user communities and public sector (ministries responsible for healthcare and entrepreneurship, national health insurance, and the national health development agency). The cluster is part of the European Connected Health Alliance and ScanBalt network.

By leading this network, Tehnopol has seen already through last year several new businesses arise based on combining the technology with new behavioral patterns appearing and patient comfort. As the health data is extremely personal and delicate the solutions have always high complexity. To find correct pace for each of the important partners personally and the timing for the whole set of players is a hard, systematic and constant training comparable with the game of basketball.

And again, we can draw several triple helix systems even inside of this cluster. The most important might probably be patient-data-hospital triple system engaging at the same time at least data production (by patient), analyzing (by computing) and interpretation-implementation (by hospital). Not looking at the number of players combined, we can clearly see the shift pushing us towards cooperation-based innovation.

Estonia - a space country. Really?

Another brilliant and naturally developed story can be told about the space. With the most serious intentions and based on very high-level knowledge of Estonian universities, European Space Agency (ESA) business incubator was just launched in October 2017. The operational model of ESA BIC Estonia shows once again the ability, will and desire to do things in cooperation. Under the guidelines of ESA, with the initiative of Tartu Science Park, with the business development competences of Tallinn Science Park Tehnopol, with the money of Tallinn and Tartu City governments and the support by parliament space committee and Enterprise Estonia, new functions for space technologies will be found on ground. The first projects are already in incubation, second patch of ideas has been accepted. This has taken only half a year and the whole process (incl. huge amount of paperwork) not more than two years from the first talks. And as you can already feel, this is another case where Estonia's innovation reaches new horizons. Might this be already a sign of some systematic and more sustainable mental shift? Yes, I believe so.

Tallinn Science park Tehnopol - 10ha of testground.

In sync with our actions in ESCC there is a **real life testground in Tehnopol**. Two types of smart streetlight systems, the densest network of electric car loading docks, mobile controlled bike stands, Starship package robots test ground and of course different office building controlling systems of Estonian companies have been already set up in Tehnopol. Yes, Tehnopol has and is paying for most of those offering this way a support to tech companies. And the main support is not the money paid. The biggest value lies rather in possibility of testing in very real life and quite hard Nordic climate conditions. Yes, sometimes in the beginning the products might work not quite as wanted. Another benefit gained by the companies is the reference what can be used and even must be utilized for the next possible tender, only then the money follows.

Pessimists might probably ask: "How you can live with almost working products? This is no good!" Actually, in those cases everything is good, and we can see only upside by being patient and fulfilling this way our most important task of supporting tech entrepreneurs. The efficiency, comfort, saved time and other practical values are just coming along, and not in so far future.

About the rest of Estonia?

Besides two biggest cities several towns are infected by innovation, each one in its own way. To be reminded, new business can happen everywhere. The circumstances must only be favorable. The place or the timing only will not give the result. These two at least must fall together followed-supported by initiative, knowledge, money and a bit of luck won't hurt.

Viljandi, a town in the center of Estonia, has extremely strong cultural background having Cultural College of University of Tartu there at the same time with high level of metal industry enterprises. The combined side-effect is for example metal handicraft and jewelry, but the culture-based design is helping several local industries with modern yet national look. The good lessons from previous business in combination with wish to save time have given world fully automated package robots by Cleveron, known also very well on the other shores of the Atlantic used by Walmart. Only with this momentum and success Viljandi has written itself into history of Estonia's ICT, electronics, mechatronics and business by being one of the fastest growing companies.

North-East of Estonia has another story. Former heavy industry district - mainly oil-shale and energy production based - with 4 big towns struggles with modern values of lowering CO₂. Yet, modern transit business, reasonable priced ICT competences and well-disciplined quality labor help this region to new life. Digital media incubator in Narva, oil-shale competence center in Kohtla-Järve or several industrial parks near Jõhvi and Kiviõli have been supported by state in very clear knowledge of need of transforming the economy into more CO₂ friendly one.

Different signs are showing the spreading of entrepreneurial spirit across Estonia. The trend of open offices and co-working spaces for startuppering has reached Pärnu. Robotics can be noticed in many towns, Innokas is a good example from Haapsalu. And there are more stories to tell.

Conclusion

The list of Estonia's innovations is long and as long is the list of lessons learned which we are most happy to share. Startups, scaleups, MNE-s, universities, accelerators, funds and most important - bright people with excellent ideas and entrepreneurial spirit - is all together our innovation

foundation. In addition, timing of joint developments and synchronizing interests, raise of awareness on all layers of innovation agents, constant and systematic attention on future behaviors and the smartness of using new technologies are the topics we consider us rather advanced. Even so advanced that we dare to share the knowledge not only in e-governance but also in innovation management.

Nevertheless, the incredibly beautiful area of 45 339 km² and 1,3 million inhabitants will continue to be the most digitized community in search for even better life and being one big area of innovation for each person on the planet with the good ideas and enthusiastic will.

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