Place-based innovation ecosystems

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1. Introduction

For regional innovation systems to enable regional transformation regions need to focus on a place-based approach locally and at the same time work together and create an inter-related vision of what a sustainable society could be.

Especially in the attempt to create sustainable policies and implementation actions, BSR cities and regions need to rely on strategies that strengthen the place-based assets. Such strategies are not limited to single issues, but powerful and relevant for issues of sustainability and wellbeing which are linked to each other. These urban challenges necessitate a unique and necessary focus on science and research which can help key players to deal with the challenges they face. A place-based approach can leverage the regional strengths in science and research.

In presenting the stories of the place-based innovation approach of the Smart-Up BSR participating regions through their regional pilots, this report highlights the double aim of place-based innovation ecosystem: regional economic transformation and the attainment of globally sustainable, cross-regional transformation.

In practice, as pointed out in the quote above by the city of Aarhus, solutions to local development issues and challenges that cities face will most often contain a significant element of digitalization and will require implementation of technology. In addition to technology, as pointed in the quote by the city of Espoo, the future of cities and regions is forged in daily work serving citizens and by citizens. Both aspects, technology and citizens, need to be taken in consideration and integrated into the core of sustainable economic transformation and Smart Specialisation strategies. An agenda for the future from a citizen's perspective has been explored as recently as 2020[1] by a High-Level expert group of DG Research and Innovation (R&I) of the European Commission and by the City Science Initiative (CSI). The guiding principle for the work of CSI is that cities have become 'communities of (complex) systems and people'.

In this view, the cross-cutting dimensions of thematic pilots of urban challenges lead to concrete activities putting strategy into practice to improve local everyday life. In our

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[1] The Human-centered city, opportunities for citizens through research and innovation. (2020) European Commission, Directorate-General for Research and Innovation.

study of the pilot activities in BSR regions we have come across the complexities of transferring knowledge and experience from strategies towards implementation and economic transformation. Coordination actions were taken to engage EU level experts to assist in the activities, thus creating cooperation channels between SDGs and Smart Specialisation actors for regions to reach the high-level goals of the EU and SDG agenda.

Four areas have been observed which particularly provide a basis for an integral and cross-sectoral approach and which BSR cities and regions need to consider as part of the urban challenges they face: Active Healthy Aging, Climate Change, Circular Economy, and Smart Cities / Smart Ports. In the following, some developments in theBSR are presented within the framework of these urban challenges.

2. BSR place-based innovation ecosystems

While as an entry point it is useful to look at the positioning of the BSR region according to European and Regional Innovation Scoreboard (EIS, RIS), we cannot simply position the regions based on their Innovation Index.

We gain knowledge on the strategic path of the regions by examining Smart Specialisation strategy work through procedural facets such as practical measures of strategy creation, governmental and administrative processes, stakeholder engagement, monitoring, revisions and roadmapping. Therefore, the proposed approach of evidence-based policy making, is to go beyond the Innovation Index ranking.

The EU has called countries and regions to develop Smart Specialisation Strategies for research and innovation to ground their research and innovation investments from European Structural and Investment Funds.

Therefore, in this chapter we present a literature analysis of academic studPlatfies on Smart Specialisation Strategy creation and a review of the Joint Research Centre information repository. This chapter systematically reviews the current understanding of how regions benefit from Smart Specialisation strategy creation to implement their place-based innovation ecosystems answering the thematic challenges presented in the previous chapter.

The main objective of the Smart Specialisation strategy, implemented in the European Union, is to enhance Europe's regional competitiveness in the world. In order to achieve this, the European Commission has mandated countries that wish to use the financial investments from the EU Structural Funds to set their own priorities for RDI. With the implementation of the Smart Specialisation strategy, it is aimed to exploit the innovative potential of the European regions, strengthening the links between education, research, experimental development and innovative activities with the economic needs.

Smart Specialisation - EU Policy Framework

Investing in research, innovation and entrepreneurship has been at the heart of Europe 2020 accompanying the goal to maximize Europe's potential to deliver smart, sustainable and inclusive growth. In its core, designing national/regional research and innovation strategies for Smart Specialisation has been a means to deliver more targeted Structural Fund support and harness regions with policies to support their economic transformation. To enhance the potential for a growing sustainable knowledge economy, regions have joined forces to pool resources on the basis of matching Smart Specialisation priorities in high value-added sectors and partnerships in specific fields have been developed. In addition, thematic Smart Specialisation platforms have also been created.

Platforms supporting place-based innovation ecosystems

According to the figures of the Smart Specialisation platform over 120 Smart Specialisation strategies have been developed, over EUR 67 billion have been made available to support these strategies under the European Structural and Investment Funds as well as through national / regional funding. The expected achievements by 2020 have been to bring 15 000 new products to market, to create 140 000 new start-ups and create 350 000 new jobs. Moreover, to support the process, the Commission has set up a Smart Specialisation Platform, which, since 2011, has advised Member States and regional authorities on how to design and implement their Smart Specialisation strategies. It facilitates mutual learning, data gathering, analysis, and networking opportunities for around 170 EU regions and 18 EU national governments (COM(2017) 376 final). By mid-2018, 18 EU Member States and 175 EU regions, as well as 5 non-EU countries and 15 non-EU regions have registered to the S3 Platform, and the community is continuously growing.

The Smart Specialisation platform has provided guidelines and tools for monitoring and assessing. The regional Smart Specialisation Strategies have been encouraged to outline their policy mix (EU funded and other) as used in implementation in order to realize political visions and strategic objectives. To turn the outlined measures into action for example regional strategies have to particularly be fit to stimulate private research and innovation investment. This includes constantly balancing the involvement of stakeholders, from public authorities, to scientific entities, to entrepreneurs, in the design of individual support tools and in the concept of the overall innovation support system. Such work should encompass not only direct financial support to specific R&I projects, but also cooperation platforms, support services, infrastructures.

As mentioned earlier the JRC Smart Specialisation Platform gathers the current information on S3 and SDGs in the section S3 Beyond Europe which deals with SDGs among other non-EU aspects. At the time of writing in March 2020, information is provided on a small number of regions that have indicated how their Smart Specialisation strategies link to the SDGs which they have chosen as their goal to achieve. Such regions are listed under 'Regional Inspirations' and they complement the information on International Partnerships formed around SDGs, and National Inspirations as well as Urban Inspirations. The International Partnerships cover areas related to Smart Specialisation Strategies in Agri-food, comprising for example, traceability and big data. Of all the five agri-food related Smart Specialisation International Partnerships there are no partnerships comprising the Baltic Sea Regions, but rather the partnerships are spread out around the European territory including relevant clusters around Europe depending on the thematic cluster. The five currently set up International partnerships are linked to funding schemes like Horizon 2020.

Two examples can be mentioned from the Baltic Sea Region currently available on the S3 platform through information on Regional Inspirations (example: The South Finland Region) and on Urban Inspiration (example: the Finnish city of Espoo). SDG implementation is also on the agenda of the city of Helsinki, as the Helsinki 2019 strategy acknowledges: "… the

significance of cities as solvers of current major global challenges will inevitably increase. Cities are solution-oriented, pragmatic and agile as they seek solutions to the challenges of social segregation, climate change, energy". (City of Helsinki, 2019)

In addition to the six cities strategy in Finland, other European cities can be presented as examples of existing effort to link Smart Specialisation strategy with SGDs such as Sofia, in Bulgaria. From the list of Regional Inspiration the following regions can be mentioned: Abruzzo, Puglia, Catalonia, Northern Netherlands, Lapland, and South Finland (see above). Among the National Inspirations the countries mentioned are Croatia, Poland, Malta, Cyprus, Norway, Serbia, Australia.

Place-based approach through Smart Specialisation

As an innovation policy approach, Smart Specialisation strategy aims at the renewal of regional economies through specialisation and diversification. It suggests a strategy and a global role for every national and regional economy, including both leader and less advanced territories. (Foray, D. et al., 2012)

European regions have been guided to analyse their regional strengths and to create their own regional R&D strategy for Smart Specialisation. This requires in addition to a local entrepreneurial knowledge also recognizing domains for future growth and participation in the global markets. Reaching to an understanding of business opportunities on the global markets entails creating strategies that combine the existing regional knowledge and industrial strength and encourage innovative solutions in R&D or market-based technology products. Smart Specialisation strategy has spread fast in policy circles (Foray, 2015; Foray, David, & Hall, 2011), although as concept it is still evolving. This is related, first, to the fact that the S3 concept has moved from its origins in research and innovation policy into regional policy, and from an aspatial and narrower sectoral perspective on innovation into a more multidimensional approach (McCann & Ortega-Argilés, 2013a, 2013b). Second, the concept is responding to the unprecedented policy experimentation taking place across Europe, as an increasing number of regions adopt the S3 approach and design S3 strategies. S3 has been an *ex ante* conditionality to access European Structural and Investment Funds in the European Union (EU) programming period 2014–20. For the knowledge base related to S3 implementation to grow, more in-depth studies of their contextualization in different regional development settings are needed.

We can base it on a dynamic theory of growth, which allows smart Specialisation strategies to coordinate the search of new business areas through an entrepreneurial discovery process. (Foray at al., 2012:2; Foray, 2015; Mäenpää and Teräs, 2018) Included in the process are regional stakeholders in a triple helix fashion. In this context stakeholders may include organisations, which may to formally carry the responsibility for the Smart Specialisation Strategy work (consultant agencies and other non-public actors).

The development of Smart Specialisation strategy may have been seen as a set of certain type of rules and procedures to fulfil the ex-ante conditionality, which has been enforced by the European Commission (EC) to access the ESIF. The development of Smart Specialisation

strategy can be seen as a game of developing a strategy without a real obligation to implement it.

Sörvik et al. (2019) emphasized that to increase the knowledge base of S3 implementation, more in-depth studies of their contextualization in different regional settings are needed.

Contextualisation should be considered as an important part of Smart Specialisation, given that it seeks to ensure that proposed actions are based upon sound evidence that properly reflects the comparative advantages of the physical and human assets of particular places in the global economy. (Soumodip Sarkar et at., 2020:4)

The European Commission has examined Smart Specialisation and come to the conclusion that it has evolved from a theoretical concept to a tool for the implementation of national and regional innovation policy in all European Union regions. It is relevant to note that Smart Specialisation strategies have significance irrespective of the regions' economic development level, innovation performance, governance structure, research capabilities or business environment.

Innovation and Public Actors

The role of public organisations in the Smart Specialisation strategy process for regional economic transformation is prominent, thus expanding the range of collaboration in innovation. Although the role of public organisations may vary (Mäenpää, 2020:6) Smart Specialisation goes beyond the passive support of public organisations as funding is allocated. Whereas universities and companies have relied on innovation to fulfil their own as well as their societal function it is through the Smart Specialisation strategy process that public organisations have gained a key role in innovation activities and in being protagonists of Specialisation choices in regional and inter-regional forums. Thus, Smart Specialisation strategy has allowed a collaborative process in triple helix fashion to formulate strategy and identify key policy objectives. Smart Specialisation strategy can through this collaboration among regional actors ensure a tailored strategy design and policy making process, followed by a monitored implementation process to be reflected upon. As Rodríguez-Pose, di Cataldo & Rainoldi (2019:9) point out regional public authorities function as equally significant pillar as companies and universities in the innovation mechanisms of a region. Therefore, the capacity of a region to deliver does not only depend on each separate pillar but on their capability to collaborate in order to deliver. There is agreement that in Smart Specialisation strategy "local and regional authorities have become key players in the promotion of the interactive collaboration between all relevant regional stakeholders for the collective identification of key innovation assets and long-terms strategic priorities." (ibid, 2019:9)

Morgan (2013) identifies three challenges for EU regions with regard to Smart Specialisation: conceptual, operational and political challenges. In order to overcome these challenges, it is important to view that the role of governments in Smart Specialisation process grows as regional governments recognize that innovation is a collective effort in which the capacity to work together and lead the strategy coordination process is a decisive factor. Accordingly, the Regional Strategy Diamond (Fig.1) presented as a framework in this

study puts leadership and context in central position to balance the other key angles of the regional strategic creation process as practice.

Smart Specialisation Strategy and Regional Innovation

Smart Specialisation can be seen as a continuation of regional innovation systems (RIS) thinking (McCann & Ortega-Argilés 2016). A historical view regarding the background theories of regional innovation systems has been conducted by Asheim, Smith and Oughton (2011: 877). They distinguish regional innovation systems from other innovation theories, such as e.g. national innovation systems (NIS) (Freeman 1984), or theories of industrial clusters (Porter 1998a, 1998b; Baptista & Swann 1998; Swann & Prevezer 1996) which have affected the evolvement of regional innovation systems. Broader innovation theories, e.g. learning regions (Asheim 2012), or innovative milieu (Crevoisier 2004; Camagni 1995), and triple and quadruple helix have broadened innovation theories focused on research and technology development towards more multi-actor cooperation.

The main features of innovation ecosystems are also decisive factors that guarantee successful Smart Specialisation strategy creation and implementation. Innovation ecosystems usually include universities and research institutions, access to sufficient financing for new companies and new research avenues. It also includes a favourable combination of large established companies and new start-ups, specialisation of expertise coupled with cooperation among firms, industry and service companies which build on the specialized needs of local companies and a sufficient local market to support the launching of new innovative products, and secure global networking. Finally, it also includes a form of secure global networking, on top of explicit features which may apply to regional innovation strategies specifically. Hautamäki (2010) states that successful ecosystems have a "community of fate", meaning that the actors and (triple helix) stakeholders of the region realize that their success is linked to the success of the region as a whole. The cooperation that the Smart Specialisation strategy principle requires internally in the region and externally across regions leads to economic transformation. The collaborative implementation of the Smart Specialisation strategy is inevitably a way to enable the community of entrepreneurial activities to take place.

To monitor and assess results regional information is used as evidence in Smart Specialisation strategy. Such monitoring may extend to knowledge of the market, focus of the changes taking place in industry, competencies relevant to the region, actions in politics, culture and even beliefs and values. These all affect the development of innovations and enhance new possibilities for technological and business development supporting the economic transformation of the region.

A description of innovation hubs and innovation systems indicates the region's ability to put the system for innovation into action. Smart Specialisation is a way to set the wheels in motion, and create a strategically led environment to support innovation and economic transformation.

EDP (Entrepreneurial Discovery Process)

Entrepreneurial knowledge is important in Smart Specialisation strategy process as it distinguishes S3 from traditional innovation policies by including private stakeholders. The entrepreneurial aspects constitute a bottom-up approach and a wide collective reflection process of the regional assets and possibilities, thus securing not only economic, but also social outcomes, while relying on policy and economic rationale. (Mäenpää, 2020:28; Ahlqvist, Valovirta & Loikanen, 2012; Mäenpää and Virkkala, 2014:4)

Towards Economic Transformation

The aim of the Smart Specialisation strategy process is to boost innovation-led growth, nurture competitiveness, and reduce gaps between regions. In order to understand the application of Smart Specialisation as a strategic approach to innovation-based regional development and later be able to tackle the complexity of regional transformation processes in the Baltic Sea Region, it is helpful to map out the applicability of S3 generally in Europe. Some points on the objective of the Smart Specialisation strategy process can be made to then evaluate the transferability of theoretical approaches to innovation and place-based regional development to the Baltic Sea Region settings.

The transformation of the existing structure of the economy to a higher value added and innovation intensive configuration in a country or region was one of the major goals introducing Smart Specialisation strategies. Smart Specialisation strategies aim at confronting structural weaknesses through progress in three mutually reinforcing priorities:

- smart growth, based on knowledge and innovation;
- sustainable growth, promoting a more resource efficient, greener and competitive economy;
- inclusive growth, fostering a high employment economy delivering economic, social and territorial cohesion.

Ultimately, strengthening the economy and the innovation systems is done by selecting a limited number of priorities for national/regional development. Having a strategic and integrated approach to innovation maximises the European, national and regional research and innovation potential. Smart Specialisation strategies have proven their effectiveness and today continue serving the initial purpose. Countries and regions that already have

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National/regional research and innovation strategies for smart specialisation (RIS3) are integrated, place-based economic transformation agendas that do five important things

- They focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development, including ICT-related measures;
- They build on each country's/region's strengths, competitive advantages and potential for excellence;
- They support technological as well as practice-based innovation and aim to stimulate private sector investment;
- They get stakeholders fully involved and encourage innovation and experimentation;
- They are evidence-based and include sound monitoring and evaluation systems.

gained experience in designing and implementing innovation strategies now support activities for revisiting and upgrading them.

The goal of Smart Specialisation has been widely described in EU publications starting with the Guidelines compiled by Foray et al. (2012). Smart Specialisation refers to the theory of economic transformation, and it is put into action as a policy model (S3) which is based on this theory and as a worked out regional strategy (RIS3) (Mäenpää, 2020). As a regional policy document Smart Specialisation aims to fulfil the Smart Specialisation policy requirements as well as putting it into action. This study emphasizes that there is impact in both directions, from the policy to the regional strategy and from the actions of the strategy in practice back to the Smart Specialisation policy. Foray (2015) demonstrates three phases of a Smart Specialisation process: entrepreneurial discovery and spill overs, entry and agglomeration (clusters of companies), and structural changes. The focus is based on a wider view of innovation, rather than on specific technologies to be proven. Mäenpää and Virkkala (2014:4) suggest that the regional actors should focus on a "limited number of high-priority economic activities and that these should be based on empirical evidence, as the strategy aims to further enhance the existing knowledge base and regional based skills". Simply put, this means concentrating knowledge resources and linked them prioritized activities". The expectation is to achieve scale, scope, and spill overs as a result of a process of knowledge creation embedded in the strategic creation process.

Place-based RDI policies and cross-sectoral regional development

All EU regions and Member States, have applied Smart Specialisation approaches to their research and innovation policies as an ex-ante conditionality to access European Structural and Investment Funds in the 2014- 2020 EU programming period. In addition, regions outside the EU have adopted S3 approaches to focus their research and innovation investments in the fields with the highest impact and potential for competitiveness.

Smart Specialisation as a concept applies a place-based approach to regional development, as advocated in the Barca Report (Barca, 2009). Smart Specialisation trategies aim at prioritising public research and innovation investments. To select the priority domains for the economic transformation of regions a bottom-up approach is used, with the objective to build on regional competitive advantages. "The identification of these strategic priority domains for R&I activities needs to recognise the country/region specific context, analysing of the strengths and potential of the economy." (Teräs et al., 2018:10) In S3, specialisation and differentiation do not exclude each other, but are seen as complementary. To reinforce positive economic developments in a region, the Smart Specialisation strategy process also helps recognizing relevant differentiation. Each region is encouraged to identify new combinations between region-specific competencies and region-specific opportunities (Foray, Morgan & Radosevic, 2018).

Smart Specialisation strategy includes the objective to build on new cross-sectoral synergies within and across regions to reinforce and diversify the regional economic portfolio based on identified competitive advantage. Smart Specialisation policy seeks to promote regional

renewal by opening new growth paths and diversifying the economy into new domains of Specialisation.

All EU Member States and regions develop Smart Specialisation strategies to better focus their research and innovation efforts. The Commission established the Smart Specialisation Platform (S3P) to assist EU countries and regions in developing, implementing and reviewing their Smart Specialisation strategies by facilitating mutual learning, data gathering, analysis, and networking opportunities. The application of the S3 concept is continuously spreading into new domains and to new regions, even outside the EU. Among a total of 219 regions and countries that are members of the S3 Platform, 22 are outside the EU17. Furthermore, S3 has found applications on several continents outside Europe, most prominently in Latin America and Australia. In the European Arctic, many regions (such as Lapland, Finnmark and Nordland) are members of the S3 Platform.

The interregional and cross-border dimension of smart specialisation, facilitating the extension of local ecosystems and the scale-up of regional and local innovation, constitutes an important pillar for future research and innovation policy. The European Commission has set thematic S3 Platforms on industrial modernisation, energy and agro-food to help regions work together on their common and complementary Smart Specialisation priorities, benefit from new cooperation opportunities with partners from other regions, and accelerate the development of joint investment projects. These platforms provide a unique opportunity for policymakers at EU, national and regional levels to pool experience, combine complementary competences, and mobilise financing for new innovation investments.

Smart Specialisation for SDGs Implementation

The European Commission is working towards strengthening the connection between Smart Specialisation strategy and SDGs in the EU Member States. To this end the JRC is starting to develop a new methodological approach specifically for Sustainable Smart Specialisation strategies, targeted for EU member states. Starting in November 2018, the European Commission's Joint Research Centre (JRC) has been working to share the EU experience on Smart Specialisation strategies as one of the global methodologies for Science, Technology and Innovation (STI) Roadmaps for the achievement of SDGs, with a distinctive localised (place-based) approach and widespread application across EU regions. Practical examples of such Sustainable S3 at urban, regional and national level are already available and are shared on the JRC platform. Several regional examples of Smart Specialisation Strategies linked to SDGs are included in the JRC platform as well as examples of international partnerships. This information can be found in the JRC Smart Specialisation Platform under S3 Beyond Europe and Sustainable Development Goals https://s3platform.jrc.ec.europa.eu/sustainable-development-goals. Events have been planned for 2020, though the global pandemic has caused delays starting from the beginning of March.

The European Commission has been committed to monitoring how European Member states' policies are addressing SDGs. As stated in 2019 in the Reflection Paper on Sustainable Europe 2030, "we need to modernise our economy to embrace sustainable consumption and production patterns, to correct the imbalances in our food system, and to put our mobility, the way we produce and use energy, and design our buildings onto a sustainable path. To do this we also need to gear all our science, our financing, taxation, and our governance towards the achievement of the SDGs." Furthermore, "It is not enough to have a vision, we also need to agree on a concrete way to get there." As the reflection paper points out Smart Specialisation offers prospects for achieving a sustainable Europe in line with SDGs through cooperation:

The thematic smart specialisation platform for industrial modernisation offers opportunities to regional managing authorities with similar Smart Specialisation priorities to cooperate based on each other's competences, share infrastructure, allow scaling up to larger impact and develop joint investment projects.

Again, in the reflection paper on Sustainable Europe 2030 Smart Specialisation is mentioned first among the opportunities and drivers of Europe 2030 with regard to achieving the goal of sustainability and SDGs. The JRC platform makes available examples of local, regional, national and international partnership applications of Smart Specialisation as a localized and transformative STI Roadmap for SDGs. Examples of the regions are annexed in this study in Annex II. The JRC also includes examples of the International Smart Specialisation Partnerships in high technology farming[2], consumer involvement in agri-food innovation[3], nutritional ingredients and smart sensors 4 agri-food.

The JRC Smart Specialisation mechanisms are linking to the works of the Global Pilot Programme of the UN Inter-Agency Task Team on STI Roadmaps for SDGs to address the wider impact of Smart Specialisation strategy. Smart Specialisation for Sustainable Development Goals focuses not only on EU policy making but also aims at showcasing to the rest of the world how Smart Specialisation supports the implementation of SDGs. In addition, there has been a growing interest in adopting Smart Specialisation strategy as a reference approach to localised innovation-led transformation agendas in a number of countries outside the European Union and across the globe, accompanying an increased focus on SDGs as key framework for setting targets and aspirations.

The EU has published a European Handbook for SDG Voluntary Local Reviews as an inspirational framework to set up Voluntary Local Reviews (VLRs) for monitoring the SDGs at local scale. VLRs are a fundamental instrument offers to policy makers, researchers and practitioners to monitor progresses and sustain the transformative and inclusive action of local actors towards the achievement of the Sustainable Development Goals (SDGs) in general, and competitive sustainability in particular. International Smart Specialisation Industrial Modernisation is constantly being emphasized in European national and regional

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[2] Link accessed on April 3, 2020 High Technology Farming.
[3] Consumer Involvement in Agri-food Innovation.

policy making based on innovation, creativity, knowledge and sustainability. This is in line with the UN goals to build on the role of traditional knowledge, potential impacts of emerging technologies, barriers for scaling-up solutions, and ways to ensure that science, technology and innovation benefits all, leaving no one behind.[4]

Originally the Addis Ababa Action Agenda[5] recognises science, technology and innovation (STI) as a means to achieve Sustainable Development Goals (SDGs). The EU and EU Member States and regions together with UN institutions, the UN global pilot programme countries, and with other international institutions as well as experts and practitioners build up local policies by sharing experiences in how strategies have been implemented in practice. Cooperation between the European Committee of the Regions and the UN – Department for Economic and Social Affairs (DESA) are initial measures to extend discussions that can bring together two perspectives: firstly, the challenges and achievements in implementing Smart Specialisation strategy as localised roadmaps for transformation and for the achievement of the SDGs; and secondly, testing the emerging global methodologies and tackling sustainability challenges in the context of rapid technological change through discussions with UN stakeholders including UN- DESA, UNIDO, UNESCO, UNCTAD, the World Bank and countries involved in the UN Global Pilot Programme on STI Roadmaps for SDGs[6].

Themes that can help regional smart Specialisation strategies and SDGs build on each other can be derived from the UN Global Sustainable Development Report (GSDR) which focuses on using science, technology and innovation for accelerating progress towards the SDGs. The GSDR entry points indicate key areas for STI action in support of the achievement of the entire range of SDGs, in particular through addressing trade-offs, realizing synergies and accelerating progress towards the overarching objective of 'leaving no one behind'. The GSDR presented four levers of change (governance, economy and finance, individual and collective action, and science and technology) which can catalyse change across multiple SDGs by working through in six entry points: strengthening human well-being and capabilities; shifting towards sustainable and just economies; building sustainable food systems and healthy nutrition patterns; achieving energy decarbonization and universal access to energy; promoting sustainable urban and peri-urban development; and securing the global environmental commons. These entry points also indicate key areas for STI action in support of the achievement of the entire range of SDGs, in particular through addressing trade-offs, realizing synergies and accelerating progress towards the overarching objective of 'leaving no one behind'.

Concluding remarks

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[4] https://sustainabledevelopment.un.org/?page=view&nr=3268&type=13&menu=1634. Workshop on Science, Technology and Innovation for the SDGs

[5] Addis Ababa Action Agenda can be accessed in: https://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf

[6] Roadmaps for SDGs can be accessed in: https://sustainabledevelopment.un.org/tfm#roadmaps

The outcomes of regional Smart Specialisation strategy present issues related to place-based innovation ecosystems from a range of perspectives, such as human well-being and capabilities, and economic transformation transitioning to sustainable and just economies.

Furthermore, regional strategies touch on GSDR entry points such as food and nutrition, energy, and cities. Global initiatives somehow related with regional and sectoral initiatives would include space technology applications for the SDGs (Space4SDGs), or GSDR entry point global environmental commons. New and emerging technology clusters are easily coupled with the SDGs either in through Financing and investing in Science, Technology and Innovation for the SDGs or through societal implications and ethical perspectives and initiatives.

Some advances have been made in the Baltic Sea Region in applying Smart Specialisation strategy as a place-based innovation methodology driving the achievement of the SDGs.

During the course of the Smart-Up BSR project the focus in the participating regions on Smart Specialisation strategy was directed on the establishment and implementation of transformative localised, place-based, innovation-driven strategies/roadmaps. This includes how regions and cities that in their Smart Specialisation strategy creation work have found ways to target their Smart Specialisation strategies towards SDGs.

3. Story report of place-based innovation ecosystems

A fundamental challenge is how regions can provide solutions to grand societal challenges, contributing to citizens' wellbeing, active healthy ageing, smart and inclusive use of technology, and confronting climate change. In addition, a goal for the Baltic Sea Region is to attract relevant businesses inclusively and to do so by applying cross-regional collaboration in policies and actions.

To achieve an economic transformation that includes becoming smart and sustainable a city or region needs competencies and instruments for active engagement and collaboration of all stakeholders. When the ambition is a future inclusive, green, and entrepreneurial Baltic Sea macro-region the appropriate strategic instruments are crucial.

In the following we present the story report of the regional pilots and their regional implementation. Our intention is to unwrap from the observed pilots what capacity gaps the regional actors are facing. The actions taken are analysed to understand what strategic instruments can set cities and regions into motion to engage and develop their local industry strategies while addressing them cross-regionallly and internationally and at the same time tackling shared societal challenges.

First, we establish what are the targets, policies and methods. By means of the processes of change management during the implementation pilots of our study, the following targets, policies, and methods have been evidenced:

- Smart Specialisation
  - as a policy for sustainable economic transformation
  - as a means for SDGs Implementation
- Entrepreneurial Mindset
- Evidence-based Policy Making

The assessment of the pilot actions was done in the following regions of Baltic Sea macro-region: iDenmark-Aarhus, Estonia-Tallinn, Finland-Helsinki-Uusimaa, Finland-Kymnelaasko, Latvia, Lithuania, Poland, and St. Petersburg, Russia. For reference a more comprehensive summary of the pilot descriptions can be found in the annex in form of a comparative overview of the regional stories.

The organisations and institutions participating in the Smart-Up BSR project pilots have assessed their experiences from the perspective of how their region benefited from the pilot and what role their organisation has played during the implementation, and how regional strategic actions towards economic transformation have been systematically implemented in their pilot activities.

This constitutes the result of several change management activities i.e.: Innovation Camp activities and co-creating processes including scenario analysis and regional forecasting

through regional SWOT analysis for Smart Specialisation strategy, and multi-stakeholder participation.

The analysis considers the importance that the region has assigned to their implementation pilot, the degree of participation, the scope of the activities and expected results. Unless stated otherwise direct quotes used in the analysis are extracted from the specific case reports provided by the local organising team in each region.

Smart Specialisation revisions have allowed each region to revisit and update their implementation plans. Smart Specialisation has allowed a broad-based approach to innovation policy combining regional scientific knowledge production and entrepreneurial mindset with experience-based regional know-how. The combination of the various types of knowledge becomes evident through the entrepreneurial actions and vivid activities of learning by interaction. By analysing regional pilots for strategy implementation we can assess the results of evidence-based strategy implementation. This exemplifies what what Asheim, Isaksen and Trippl (2019) call DUI (doing – using – interacting).

Therefore, the analysis reflects the pilot process starting from sharing knowledge, to learning from each other, to doing, to reflecting together on the results of stepping forward, and then through these interactions moving forward with revising actions.

Regional Pilots

In order to go deeper into the reality of strategic implementation at local and regional level we need to acknowledge the intense work that is being done by regions and municipalities.

Regional actors may not all be able to resort to qualities and competences necessary for an entrepreneurial approach to regional development led by innovation while the more traditional approaches apply digitization to more operational issues.

A closer look reveals how each region differs and is undergoing a process of alignment while operating within its particular administrative and territorial set up. Results can vary based on the administrative nature and the outlook outwards either regionally or internationally.

Result of shared pilots: Various events in neighbouring regions and the environment surrounding a region can significantly influence the impact of the resulting strategies.

For municipalities and policy makers the challenge is to make evidence-based choices based on place-based innovation ecosystems in competitive landscapes that integrate different modes of innovation as well as various knowledge bases in local-global interaction.

Pilots in Smart Cities and Smart Ports

Predominantly, the development of innovative technological solutions for citizens and for use by public authorities has been articulated under the concept of Smart City. Several regions chose to pilot their strategy implementation within a Smart City framework.

As an example, a recent analysis of the Danish market on behalf of Smart City Cluster Denmark, "reveals that there are currently 18,000 FTE working in Smart City related jobs in Denmark and revenue in Denmark is already estimated today to be $ 32 billion. If Denmark further embraces global growth in the Smart City area of 12-17 percent per year, it could lead to up to 53,000 jobs in 2025. That's 35,200 additional employees in the field in just six years".

From the examples of the city of Tallinn, the Kymenlaakso Region, and St. Petersburg pilots we can gain insight on specific steps of smart city implementation. Furthermore, the development of smart ports as a sub-theme is closely related to Smart City theme. Collaborating port cities (Tallinn, Aarhus, Klaipeda, Gdansk, Kotka, Stockholm and Helsinki) are interested in the smart port initiative within the Smart City theme.

Denmark – Central Denmark region (City of Aarhus)

As is pointed out by one of the project partners in Aarhus, Denmark, for many municipalities despite the many initiatives and informal collaborations, the work on understanding and implementing new technology continues to be difficult to push forward. "It takes focus, skills and time to become familiar with radically new concepts and fields such as sensor technologies, data transmission, machine learning, drones and data visualization".

As an example of the diligent step-by-step local efforts in numerous municipalities in BSR, the Central Denmark region lists the consistent work required from municipalities to "explore, test and implement IoT solutions, e.g. by installing sensors in waste bins, setting up IoT networks in municipal buildings, measuring the indoor climate in municipal buildings, or counting cyclists on the local mountain bike routes. The work is often driven forward by technology savvy individuals and supported by informal sparring with other municipalities that have tried similar solutions". Alternatively, the activities have also been initiated by local suppliers and consultants, eager to establish test solutions, representing local knowledge and entrepreneurship.

Assumingly, the following statement summarising the Aarhus assessement at local level can be shared by most municipalities in the BSR which are implementing evidence-based approaches: "Municipalities have doubts about which direction to go, what technologies to focus on, where to buy the right equipment, how data is best processed and presented, and which technology providers are the right ones to collaborate with. The experience across public authorities is such that there is still a great task - political as well as practical - in describing potentials, allocating resources and coming from pilot project to large scale solutions".

Estonia – City of Tallinn

Tallinn City has chosen smart city as the spearhead topic for its pilot to build on top of already existing competencies in ICT. To achieve this the city has used the pilot and the innovation camp orgaised by Tallin City Enterprise Department to to examine its internal processes and collaboratively find solutions to improve the smart city implementation. In order to answer the challenges of how to smarten up the region, increase citizen participation and promote co-creation to improve living environments, as well as making the city digital, the internal project selection procedure was put under scrutiny.

The city has been using an internal system is based on bottom-up logic: the individual departments or city-affiliated organisations initiate different projects. To ensure the realisation of the smart city priorities the city's strategy unit approves the initiatives that fulfil the city's development plan.

While all projects are in a project database, the awareness about new project initiatives has been low in different departments of the city government. Also, it is not always clear based on the portfolio of approved projects if there has been a careful analysis of how the project could impact the activities of another department.

Therefore, Tallinn City Government envisions that its project development processes need renewal. A restructuring in underway, however a development of competencies could support even further the objectives of the re-organisation.

- To better evaluate each project's economic impact and link with the city's priorities;
- To use financial and human resources more efficiently and effectively;
- To establish a thorough overview of projects and resources in use;
- To make sure that projects are run on the same principles.

While Tallinn focused on its traditional strengths in ICT, Kymenlaakso´s economy has traditionally relied and still relies heavily on its operating ports and port related activities (especially logistics).

Smart port related developments were therefore envisaged as the most suitable spearheads for Kymenlaakso's pilot project. In addition, smart port related activities include a sustainability aspect. As reported by the Kymenlaakso pilot: "themes of sustainability and circular economy have begun to gain prominence in the last couple of years. A strong growing trend is that port areas attract investments in bioeconomy and renewable energy. This shows that all today´s developments and investments must have an ecological aspect to consider in some way and the Kotka port areas are putting this into practice".

The aim of the smart port pilot is that the Kymenlaakso region´s innovation actors will benefit from novel synergies, have access to new networks, opportunities and cooperation which are enabled by favourable surroundings, conditions and processes created by this

innovation ecosystem. The port-related piloting benefited the local innovation ecosystem in the following ways:

- Links to new partners operators that bring added value and competence
- New expertise for the local innovation ecosystem especially relating to port area.
- Boost to the exploitation of new smart/ digital services and applications.
- Upgrade of ICT/ digital operating environment in port area.
- Increase of the role of ports in maintaining and attracting new industries and logistic activities to region.

Lithuania

By implementing the Smart-Up BSR activities Lithuanian partners agreed to "concentrate efforts on including transport as a priority of the Smart Specialization programme". In addition, the pilot ideas were guided the smart city mission of providing core infrastructure and give a decent quality of life to citizens by a clean and sustainable environment and the application of 'smart' solutions.

Thus, the pilot proceded to implement "Smart Port" within the smart city theme. "The strategic intent was to run a case to show how much potential there is in the sector, and how many goals Lithuania can achieve by investing and developing the smart transport sector".

This led to activities towards an evidence-based approach of analysing the situation in several ports and "their challenges, the technologies applied in the ports and generat[ing] ideas, prototypes, solutions for port digitization and automation processes with the help of target groups".

The active involvement of the Klaipeda Port authority in the process was promising, as this organization also is taking ownership of the challenge and seeks solutions. Companies, related to port industries, have to grow from port cargo handling companies to innovative equipment producers, while shipyards need to step into the industry of autonomous shipping technology suppliers.

Klaipeda region brought forward the regional challenges in their effort to become a competitive and sustainable port and an important part of Lithuanian national economy. The challenges identified are:

- How to flexibly transform local maritime industries to be in tune with global digitization and automation trends?
- How to find the region's own niche and competitive advantage?
- How to reach stakeholder consensus locally and lobby at a national level?

The Smart City – Smart Port Pilot was useful for Klaipeda Sea Port authority and Klaipeda region. By implementing the Pilot, all parties – science, business and municipality could exchange their vision of smart port. Klaipeda Port authority identified their advantages and

weaknesses comparing with other BSR ports. Klaipeda region accepted the main goal of the Port to become autonomous port.

St. Petersburg

According to the Smart City definition at federal level in Russia smart cities are to improve "the quality of city management and the standard of living in the cities through the introduction of advanced digital and engineering solutions". The Smart Saint-Petersburg follows six key principles.

1.   The principle of creating a comfortable urban environment for everyone.
2.   The principle of coordination and interaction of all participants in the development of the city.
3.   The principle of the additional purpose of urban infrastructure.
4.   The principle of sustainable development based on monitoring, analysis and forecasting.
5.   The principle of creating a digital environment for self-organization of residents and businesses.
6.   The principle of "Smart City" is a city where happy people live. This principle suggests a priority orientation on creating positive motivations of residents from interacting with the urban environment.

The goal of the St. Petersburg smart city concept is not only to digitally transform and automate processes and to comprehensively improve the efficiency of urban infrastructure, but to do so in order to create "safe and comfortable living conditions for citizens" . Building competitiveness on the principle of human orientation will help the widespread adoption of advanced digital solutions.

Entrepreneurial Actions in Pilots

In the regional pilot examples, we notice that strategy implementation needs to rely on an entrepreneurial mindset to be set in motion and keep momentum. Several regions (Central Denmark, City of Tallinn, Helsinki-Uusimaa, Kymenlaakso, Lithuania) exemplify regional actions from an entrepreneurial perspective which includes a collaborative triple/quadruple helix approach which does not only focus on each stakeholder benefit, but on dynamic solutions that support the region as a whole with tackling common challenges. Through an entrepreneurial approach, regional stakeholders can accomplish more with the resources available to the region if they work creatively together.

Denmark – Central Denmark region (City of Aarhus)

In the Danish pilot an entrepreneurial approach was facilitated through the innovation camps. "Visits and opportunities to discuss different approaches to collaboration, innovation and organization with other actors and regions strong in cross-function collaborations. This benefited the local organisational structures from an entrepreneurial perspective as the actions of single local actors were expanded as well as intensified.

An example is Aarhus City Lab. The City Lab acts as a single point of entry into the municipality for external partners. Facilitation and coordination are key aspects of Aarhus City Lab to ensure that the right people are matched which is key for entrepreneurial results in a municipal setting. Aarhus City Lab regularly host presentations, prototyping, and an Open Lab every Friday. It also offers a mobile office during the summer months

Furthermore, Aarhus City Lab acts as a forum for dialogue between citizens and the municipality. Aarhus City Lab is placed pier at the very heart of the city and is a very well-visited area during the summer months. Therefore, it offers great opportunities for the municipality to meet and engage with citizens.

Another example with a view of an entrepreneurial approach is GovTech Central Denmark as an attempt to get more done with the available resources towards establishing a much more vibrant innovation ecosystem. For the public authorities, GovTech Central Denmark will be a platform for cooperation, competence development and knowledge sharing. It will allow municipalities to develop and implement solutions, which would be unattainable on their own. For companies and suppliers, it creates a much larger and more cohesive market where suppliers have a single-entry point to contact and sell products to all the public authorities. For the region, GovTech Central Denmark is a way of positioning and strengthening the Region of Central Denmark as an innovation cluster nationally and internationally.

We find that the concrete actions taken in the pilot by the Innovation, Technology and Creativity Department of the Municipality of Aarhus (Aarhus ITK) showcase an entrepreneurial approach. Aarhus IKT is developing an IoT-suitcase, which contains a wide variety of sensors that can be utilized in a range of different Smart City applications. The IoT suitcase is conceived as a starter kit, which municipal departments could purchase to start experimenting with IoT solutions to suit specific needs.

Estonia – City of Tallinn

In Estonia the pilot participants identified a strong ICT sector, a lively start-up scene, competitive tradable services, and a trustworthy internet and web environment as the main strengths of Tallinn and the surrounding region.

Tallinn City defines its goal of developing a smart city hub in terms of exploiting RDI combined with the practical use of new solutions and attracting companies. This is a combination that demonstrate an entrepreneurial approach including a variety of stakeholders. Also, private companies are involved in the development of smart city solutions and real estate developers in Ülemiste.

To efficiently move the smart city actions the Baltic Innovation Agency developed a smart city project assessment tool for Tallinn City which can assess new ICT and smart city project ideas. The assessment tool focuses on risk assessment and potential benefits that each project can bring in different areas (economy, governance, environment, people, living,

energy efficiency, mobility, ICT). This new assessment tool will play an important role in renewing project development processes in the city.

Finland – Helsinki-Uusimaa region

In the Helsinki-Uusimaa pilot the goal was to map the overall network moving the action in the region within the sector of health and wellness. Helsinki-Uusimaa aims for more effective coordination of local stakeholders' efforts hopefully leading to novel action, research, and innovation in the Active and Healthy Aging (AHA) sector. Here the target group are the public and private actors involved in developing AHA measures and bringing active and healthy ageing into practice. The pilot seeks to find common ground between AHA activities and the digital health care

Finland – Kymenlaakso region

Planning for the Innovation Camp including challenge formulation for the Helsinki-Espoo-Kotka Innovation Camp on Sustainable Baltic Sea Region 2030. In the process of formulating challenges for the innovation camp the city of Kotka/port of Kotka provided a real-life challenge and in collaboration with University students different real-life problems and themes of interest from the collaborating partners were examined.

The work on the real-life challenge from the city of Kotka (How to combine digitalization, sea and people into sustainable business opportunities in the developing Kotka Old Port area?) continued with joint events combining stakeholders, challenge owners/partners. The final output of this collaboration was presented to challenge owners/ the representatives of the City of Kotka and other stakeholders and provided new insights and ideas on how to develop and orchestrate innovative activities in Kotka Old Port ecosystem.

Lessons learnt from joint innovation camps held in Aarhus/ Denmark, Klaipeda/ Lithuania and Gdansk/ Poland have been useful in visualizing and picturing what kind of structures, operations and activities could be included in port area-related development processes and in Kotka-Hamina region. Visions for the development of the Kotka Old Port area include: Local entrepreneurship, Extending the green environment, Securing sustainable city planning and development.

These visions entail an entrepreneurial approach in shaping the ideas into commercial outcomes, giving local actors of all ages a chance to develop their community, allowing goods to be produced locally, supporting entrepreneurship in tourism and in sustainability.

Latvia

In Latvia the Ministry of Education and Science (MoES) proactively tried to communicate and collaborate with relevant stakeholders, especially stakeholders that were interested and had regional or sector specific knowledge, expertise or experiences helpful for Smart Specialisation national strategy implementation and monitoring. Universities, research centers, businesses, municipalities and other ministries participated in the activities.

MoES took part in several encounters and interventions, by participating in numerous meetings with national and regional stakeholders (municipalities, ministries, scientific and research institutions, universities and businesses), these actions speak for a collaborative entrepreneurial approach.

Lithuania

To implement The Pilot activities Lithuanian partners organized meetings with regional stakeholders, cluster representatives, universities and other projects partners.

To achieve the goals set for the pilot various events were organised which created the conditions for and strengthened the cooperation between public and private sectors. New solutions in digitalization, automatization, and smart transport ecosystems and safety are very important for all BSR ports. So, Lithuanian partners agreed that the pilot for Smart city – Smart Port would consist of three different events to:

1. to present and share experience about new, innovative technologies and services that are developed in BSR and provide a full overview of the LNG application and perspectives, ranging from LNG road and railway transport to the maritime and inland waterway sector. Sustainable LNG and liquefied biogas (LBG) infrastructure development.

2. to generate ideas and prototypes that could be adapted in developing smart transport ecosystems and in the logistics sector through automation and digitalization of port terminal facilities and various processes; to increase port efficiency and do impact for port environment regarding SDG.

3. to generate ideas and prototypes that could be adapted in the Navy; to encourage the development of advanced products that require the highest military requirements; to bring people from different fields for the same purpose - to strengthen the Navy and development of solutions, that might be used for civil purposes of safety and security.

The implementation of the events shows the entrepreneurial approach of the Kleipeda stakeholders. According to the development manager of the Kleipeda Science and Technology Park (KSTP), Andrius Sutnikas, these event testet and open and compelling format which "became a powerful incentive for companies, students, teachers and start-ups gathered in teams not only to fight for prizes and the attention of potential investors, but also to demonstrate the ambitions and the potential of Klaipėda". This format will be used in the upcoming 2020 event jointly with Gdnask.

St. Petersburg

Smart Saint-Petersburg Project Office was launched as a cross-sectoral working group to run the dialogue between different stakeholders on the implementation of smart city in St. Petersburg. From the beginning the Project Office has been a meeting point of different sectors - governmental bodies, business and science & education (universities). The sphere of NGO and civil society is planned to increase the number of representatives, after the first

processes and work mechanisms. Eventually a functional scheme of several working groups was organized inside of the Project Office including cross-sector working groups for:

1. Smart St. Petersburg concept design, led by ITMO university experts in smart city;
2. legal & organizational conditions, led by the Committee for informatization and communication of St.Petersburg administration;
3. methodological support, led by ITMO university experts in technology;
4. PR, led by Saint-Petersburg Diary media;
5. expert and technological council, led by Tranzas technological business company.

The work done according to the Smart Saint-Petersburg concept elaborated by the Project Office is approved by the city of St. Petersburg administration and has the potential to apply entrepreneurial principles. For example, this can be achieved in the way the relationship between the different stakeholders and their motivation for involvement is outlined. The Project Office has applied the principle to activate citizens of all age groups, urban communities, public authorities and business organizations and NGOs. The focus is on the citizens and meeting "their needs in order to establish better quality of urban life". In practice this requires an entrepreneurial approach in order to overcome some of the commitment, communication, or knowledge and expertise gaps and reach a successful smart city implementation.

Building Momentum Through Pilots

While in Latvian example the responsibility of the Smart Specialisation priorities rested not with the local authorities but with the Ministry of Education and Science, we find that an equal conclusion concerning the benefits of capacity building was reached through the Latvian pilot as was observed in smart city pilots.

The Latvian MoES resolved that the pilot managed to create momentum in capacity building: "With each innovation camp MoES experts gain new experience on how to tackle different aspects of Smart Specialisation development and implementation". The benefits MoES acknowledges are insights in the "social challenges in the regions, ways of establishing dialogue between stakeholders, coordinating the bottom-up process". This is especially relevant with reference to Latvia's "aim for higher degree of international cooperation and for improving its position among EU innovators".

Denmark / Aarhus

In the Central Denmark region keeping up a momentum through a solid network is considered vital: "The network[s] established through our participation in innovation camps and pilots, have proven of high value by allowing to extract learnings from other regions strong on cross sector, cross function collaborations".

Denmark has a strong tradition of cross-municipal knowledge sharing and collaboration on, amongst other things national IT infrastructure, digitization strategies, common municipal platforms, Open Source, Open Data and different digital and Smart City clusters. Here work

is done to ensure common progress, standards, catalogues of inspiration and low-practical templates for the benefit of the community.

The GovTech centre will complement the individual municipalities' strategic work with Smart Cities and the national and regional priorities in the new Business Development Strategy, which is considered to correspond to a Smart Specialisation Strategy.

The City of Aarhus plays a significant role in several of these existing initiatives and because of the potential rewards of further collaborating on the uptake of emerging technologies, the City of Aarhus has chosen to also spearhead the GovTech Central Denmark initiative by framing the potentials, scoping the collaboration and ensuring buy-in from the 19 municipalities in the region as well as the Region itself.

As a trans-regional initiative with the purpose of enabling municipalities to explore, test and implement emerging technologies GovTech Central Denmark engages 19 municipalities in Central Denmark, the Region of Central Denmark and Business Region Aarhus and Business Region MidtVest. In total, the public authorities represent more than 1.3 million citizens and includes some of the most vibrant innovation hubs, exiting tech clusters and forward-thinking public authorities.

Estonia – City of Tallinn

Actions were taken by the City of Tallin in cooperation with which can secure building momentum. Tallinn City and Tallinn Science Park Tehnopol have launched the Tallin innovation fund called Tallinnovation to find and implement smart city solutions in Tallinn. Also, a smart city professorship in the School of Engineering at Tallinn University of Technology was established.

AI solutions in the fields of energy and mobility are envisioned to move towards carbon neutrality and the City of Tallinn has shown interest based on the Smart-Up pilot ideas to procure an AI solution for traffic management.

Finland – Kymenlaakso region

The action of the Smart Port pilot in Kymenlaaks through workshops with SWOT analysis and scenarios were a good start which led to a boost for the region to revisit its Smart Specialisation strategy, review critically the validity of the strategy and assess the need to update it. A concrete result was to take steps on how to proceed with the process of strategy update: who to involve and how to ensure that relevant input from specific innovation actors will be received.

This exercise showed regional strengths and opportunities and most importantly weaknesses and threats which need specific attention and building of new competence and collaboration. With this exercise it was possible to analyse what kind of competences should be fostered and developed internally and externally in order to manage in the future.

Latvia

MoEs participation in the pilot activies "focused on leading a dialog on issues of implementation and capacity building to secure its success. The various meetings discussed aspects of circular economy, bio-economy, IT advancements, technology transfer and other new initiatives, programs and projects that can be used for better implementation of the national Smart Specialisation strategy".

The activities included "supporting other partners in Latvia involved in pilot projects linked to the Smart Specialisation national framework".

Lithuania

Activities of the pilot project aim at creating a network of maritime innovators as well as developing unique solutions for maritime cities/regions that can be used not only in harbours and by companies who operate in ports, but also for universities to establish new pragmas, and for both Naval Forces and civil needs.

As digitization and automation are crucial in the development of maritime technologies, they have recently become a hot topic among companies and organizations in the global maritime supply chain. While the EU is still leading the maritime development globally, the challenge for regions like Klaipeda is to find the way to benefit on being frontrunners in the application of new technologies, gaining enough knowledge and capacity to transform local maritime industries to a higher added value products and services.

The pilot's momentum is growing as the Lithuanian maritime cluster is joining "Gdansk-Gdynia-Sopot Metropolitan Area" and business incubator "Starter" for the 2020 Porthaton in order to generate new solutions applicable in the logistics sector by automating and digitalising port terminal equipment and various processes as well as developing smart transport ecosystems. http://www.kmtp.lt/en/news/will-not-be-limited-to-klaipeda-portathon-baltic-expands-its-geography-16278.html

A major result of the pilot which will have a longterm eff-ect and will also keep up momentum is the updated version of the national Programme on the Implementation of the Priority Areas of Research and (Socio-Cultural) Development and Innovation (Smart Specialization) and their Priorities (July 24, 2019 Resolution of the Government of the Republic of Lithuania No 760). This was possible thanks to the efforts of stakeholders and key players. Being able to show the potential of smart and integrated transport activities led to including the separate priority for Smart, Green and Integrated Transport in the updated version of the Programme.

Regional Achievements and Potentials

The prospects of increasing jobs opportunities within the smart city sector highlight the need for more competencies, as well as focused collaboration if we are to improve the

abilities of regions to exploit new technology to a new level and achieve their growth potentials.

From a perspective of coordination, there is a strong need to build up knowledge and skills so that the public sector can push the development in a desirable direction and achieve the anticipated benefits.

Denmark / Central Denmark region (City of Aarhus)

The two examples in the Central Denmark pilot point to two sets of actions addressing different needs Civic Tech and GovTech. Civic Tech enhances the relationships between the people and public authorities and in other words provides a tool to build bridges between the citizen and the municipalities. It is technology which enables us to include citizens to participate in the decision-making process and to make their voice heard. It also allows for the sharing of data about the city. Examples of Civic Tech include co-creation, public hearing platforms, open data, living labs and citizen science.

GovTech is the public institution's use of radically new technology to improve the delivery of public services through increased efficiency. GovTech complements the traditional technological infrastructure with emerging technologies, which allows the municipality to utilize other smart city solutions, i.e. digitalization, and welfare technology.

With these two perspectives of technology development in mind, the Aarhus pilot organisers concluded that local authorities in Denmark "need to work towards more coherence as well as community thinking and common direction". GovTech Central Denmark is the product of the realisation that regions are facing the same challenges and that they can reach further with the resources available by working together.

Estonia – City of Tallinn

Tallinn City defines its goal of developing a smart city hub in terms of exploiting RDI combined with the practical use of new solutions and attracting companies. This is a combination that demonstrate an entrepreneurial approach. A strong ICT sector, a lively start-up scene, competitive tradable services, and a trustworthy internet and web environment were identified by the pilot participants as the main strengths of Tallinn and the surrounding region.

To leverage on these strengths the city needs to overcome internal weaknesses identified. While challenges may appear to be "related to the size, scale and structure (population, economy, resources) and limited attraction in the context of growth & globalisation" the actual threat recognised may be linked with a change in domestic policy. This would be the case if the policy response to the external developments would lean to "protectionism and segregation/polarisation" and "focus on contraction and enclosure".

However, the pilot's focus on the city's internal processes "helped to build stronger ties with actors in the local ecosystem and in the BSR region through more meaningful projects. …

This focus on smart city activities has helped the city to support and start several different initiatives". Intensified collaboration both internally and cross-regionally can clarify strategic action as a reflection on the pilot concluded: it "has helped Tallinn City to establish contacts with different BSR partners. In addition, the cooperation between the city government and Tallinn University of Technology was also strengthened".

Finland – Kymenlaakso region

Finland´s largest universal export and trans-shipment port, Port of Hamina-Kotka, is situated in the region and port-related activities and business have a long tradition in the region, valuable know-how and relationships have been accumulated for decades. The joint practice is an advantage for collaboration. For example, it allows the region to easily gather all actors. A working group set up by the Regional Council of Kymenlaakso to work on updating the Smart Specialisation strategy, serves as a joint platform for intensified cooperation on selected strategic spearheads/ areas (e.g. establishment of joint innovative projects).

In Kymenlaakso one mechanism for engaging different stakeholders in the future is via Smart Specialisation expert working groups (one group dedicated to certain strategic spearhead). Through the pilot all three Smart Specialisation expert working groups were gathered together to share view and experiences. "When thinking of the regional ecosystem´s role in supporting innovations, a certain thing stands out strongly: Kymenlaakso region is geographically a relatively small area and all the relevant innovation actors know each other quite well. The communication and contacting between actors are smooth, fast and straightforward."

The lessons learned were that the pilot's port related actions could have progressed faster without overlapping schedules, that competence was missing essential for pilot planning, that projects with earmarked budgets for new pilots are easier to sell the idea to potential regional pilot partners. These are valuable insights for future collaboration.

Through the engagement of a large number of stakehoders, including e.g. the students of the University of Helsinki, the work presented several concrete ideas on how to enrich an enliven the port area with innovative sustainable entrepreneurship. As challenge owners (especially land use planning) were interested in exploiting the results suitable projects now need to be drafted.

In conclusion, form the region's point of view "the piloting exercise boosted the use of Smart Specialisation strategy in a concrete way. The interactive tools gave an excellent opportunity to train predicting future scenarios, pinpoint specific development needs, develop strategic foresight thinking and intensify co-operation and interaction with region´s different innovation actors. From Kymenlaakso´s perspective lacking regional competences could be complemented with collaborating especially with project partners from port cities".

Latvia

Capacity building was a main focus for the Ministry of Educaiton and Science. For example, expectations were directed towards better solutions for closing skills gaps, or to better management of water resources, or to improved education and links between the academic and the business communities by sharing an interdisciplinary circular economy approach.

By participating in the innovation camps, the Smart-up project manager and Smart Specialisation experts from MoES gained insights and knowledge based on societal challenges that need to be considered when performing the monitoring of Latvian Smart Specialisation strategy and implementation of related activities. As reported, "a major outcome of the pilot was to learn different practices around the Baltic Sea in Smart Specialisation planning and implementation, regional capacity building and also to establish new networks".

The pilot organisers also observe that "Sector specific information regularly needs to be updated and monitored in at least the regional context to achieve better and more accurate focus and ensure engagement with all the stakeholders (policy makers, R&D sector, entrepreneurs, students and general public), providing updates on challenges and opportunities".

Latvia aims for" higher degree of international co-operation for improvement of position among EU innovators and actual impact of the research, as well as more successful cooperation in international project openings". From the Latvia perspective "the future impacts for the Baltic Sea Region are: Cooperation for new project applications (e.g. in circular economy sector) and networking, new contacts".

Lithuania

As discussions focused around many different notions, such as autonomous ships, fully automated ports, digitized shipping information and documentation, automatic monitoring of vessels and equipment, among other sectoral issues, competencies is these areas were needed. This led to the identification of the main questions for a mini Innovation camp in Lithuania, Palanga, on: How can a smart city connect and support a smart region?' To do this work international experience and best practices were needed which could be accessed by interacting with Smart up BSR network partners.

Implementation of pilot projects, stakeholder engagement and diverse operational activities in the region were the key factors in moving the Smart Specialization approach to the centre of the regional transformation processes.

Pilot activities facilitated increase of certain knowledge among KSTP and MITA. Representatives from MITA gained very interesting knowledge and experiences how to co-organize and take active part (as mentors and experts) in hackathons, encourage building of quite unique innovation ecosystem in quite closed and specific navy sector, evaluating possibilities to adopt new solutions, proposed by the winners of Delta Navy Hackathon to Port and Smart City areas.

Another result is the increased awareness of regional representatives from private and public sectors as well as citizens, about what it means to be the part of a place-based innovation ecosystem and Smart Specialization process. This improved the understanding of the benefits of actual participation and raised the level of motivation for taking active and constructive steps in the processes.

Pilot activities provided also very practical experience and skills on how to organize events, engage different stakeholders, find various challenge angles that would motivate participants to take active role in the processes.

In addition, pilot projects enhanced commitment, helped to build new skills and competencies for organizers and co-organizers of events - KSTP and MITA. Their role as key player uniting stakeholders of maritime sector in the region was established. Both institutions gained competencies in many different areas: use of new innovative tools and ecosystem thinking, encouragement of the emerging place-based ecosystem, transnational cooperation and open innovation processes, mindset of experimentation and change management instruments to assure the transfer of best practices into activities implemented.

The Lithuanina pilot projects helped to examine the existing innovation ecosystem by testing: "the networks and cooperation between different stakeholders, the response of science and business, the legal framework as well as potential financing instruments for teams in all stages of product development".

According to the participating Lithuanian partners "the competencies acquired will guide future action". The main lessons the piloting has emphasised are:

- the need for more focus on experimental development and innovation;
- closer and consistent networking with mentors and experts;
- the improvement of financial motivation systems for RDI activities and for attracting of professional mentors/ experts to work with the teams.

St. Petersburg

In the case of St. Petersburg through the work of the smart city programme and the mechanisms of its implementation the Project Office engaged in evaluating the developments. Confirmed by international studies and discussed by the Project Office members as well as reflected upon with smart city offices of international partners possible barriers that impede the development of "smart city" in St. Petersburg were identified:

1.   Slowness of city authorities. Russia as a country and St.Petersburg as a city are conservative. In a rapidly changing world rigid structures can rarely respond quickly to challenges.

2.	Hesitation of citizens. People are not always ready for change. Citizens are very careful on any projects in the historical center, and smart technologies should carefully approach the cultural heritage.

3.	Peculiarities of Russian legislation. There is a rather complicated system for obtaining a primary permit for new infrastructure projects.

4.	Different goals among stakeholders – authorities (security systems, business is interested in profitability, and citizens are more interested in a beautiful and green city.

Several of these challenges, with the exception of the peculiarities of Russian legislation, are linked with attempting local jtransformation and are often present when cities set out to implement strategic developments. Strategic instruments for managing implementation are therefore useful to balance actions, expectations and competencies and succeed to agree upon the goals and actions of the city or regional transformation.

BSR Impact of Pilots

Denmark / Central Denmark region (City of Aarhus)

Evidently, cross-border cooperation is integral to Aarhus ITK and is an important priority. It is based on the idea that we are stronger together; that progress should be shared, and smart and innovative solutions should be made available to all. That is why open source and open data is such an important part of Aarhus ITK's work. This is also the main idea that the pilot is meant to promote further. GovTech Central Denmark is an attempt to do more together and find common solutions to common problems.

Furthermore, research networks and other successful partnerships in the Baltic sea region will continue going forward as will interpersonal relationships that shape actions of high value for the future.

Estonia - City of Tallinn

Results can also have a wider impact at the BSR macro-region level. If this new approach helps the city to prioritise human and financial resources, Tallinn City could be involved into larger and more wide-ranging projects.

For future implementation it was identified that alignment with Scandinavian countries is the biggest precondition for favourable business opportunities (Scandinavia as the home market, joint sales and promotion abroad). Pan-regional development can be facilitated through meso-level strategies, e.g Baltic Sea Region Strategy. Trade barriers can create opportunities in the context of lesser competition from Asia. Liberal migration can provide access to talent beyond the EU, mainly Ukraine and Belarus.

Finland – Helsinki-Uusimaa region

The mapping exercise will foster both local and cross border co-operation in the Baltic Sea Region. BSR regions will benefit of new visions and collaboration possibilities on the AHA theme.

Finland – Kymenlaasko region

Time could be saved if information would have been available on already ongoing development plans/ initiatives in BSR with the required expertise. These are opportunities for improvement, especially taking into consideration that "international cooperation and joint projects will play even a bigger role in the future" as the pilot report concludes.

The methodology of pilot planning as discussed with partners (stakeholder mapping and scanning for relevant projects and initiatives) addressed the development of Kotka port area and/or "e-Kotka" (development of digital services/ solutions for people). While these two areas were chosen because they were already existing regional initiatives they also can be connected to cross-regional/EU level projects for building up synergies and increasing impact.

Latvia

The Latvian pilot confirms that "cross-regional cooperation was very relevant to learn practices in other countries and regions, as well as to discuss further cooperation and new project opportunities.

For the MoES cross-regional cooperation is important because investment as well as policy focusing on R&D aims towards international collaboration to ensure competitiveness and excellence through technology and knowledge transfer.

International collaboration is also needed for sufficient human capital in R&D to foster economic transformation. Therefore R&D capacity development in academic, science and business sectors is aligned with Smart Specialisation priorities".

Lithuania

In order to reach the targeted audience a wide network of BSR cross-regional partners were engaged. The invitations to the events were spread through BSR Port authorities and other interested parties. The wide interest in the pilot gathered a wide network of associated partners such as: JSC Klaipėdos Nafta (KN), Embassy of the Kingdom of the Netherlands in Lithuania, Lithuanian LNG cluster, Klaipeda State Seaport Authority, Lithuanian Naval Force, Ministry of National Defence, Enterprise Lithuania, Kaunas University of Technology, Klaipeda University, Vilnius Gediminas Technical University, Baltic Tech Park.

Smart Port pilot events were open for all who were interested in generating new ideas, have a solution on how to solve challenges, looking for new contacts and networks. We received registrations from various countries, not only from the BSR – this showed us that our set challenges are important also internationally.

The pilot events attracted participants from Poland, Sweden, Germany, Belgium, Norway, Denmark, Netherlands. There were representatives from Port authorities, Clusters, International companies, start-ups, new technology providers, students and scientists. Representatives of international companies were attracted to participate in this pilot as experts and as mentors as well.

The Lithuanian pilot indicates a clear impact for the Baltic Sea Region. Knowledge was shared between ports from other BSR countries and collaboration generated insights about "possible solution to existing challenges, ways to encourage the emergence of innovative ecosystems in the ports".

Active cooperation between Smart-Up BSR project partners, openness and sharing of knowledge about innovative solutions, elaborated in the pilot actions, might be implemented internationally and could lead to the development of Smart ports network in whole Baltic See region.

Thematic challenges in place-based innovation eco-systems

Active Healthy Aging

Healthy ageing is about "optimizing opportunities for good health, so that older people can take an active part in society and enjoy an independent and high quality of life" (Swedish Institute for Public Health). This approach emphasizes how older people can contribute in valuable ways to the functioning of the society, building on their skills and experience. Yet this requires system-wide support to introduce necessary health promotion interventions on societal level, and construct opportunities for more active involvement of older people to solving societal challenges & tasks.

Preventive and pro-active health care and Active Healthy Ageing in the BSR are an important part of Smart Specialisation entrepreneurial delivery as well as new knowledge creation by sharing findings on how to empower innovation and growth. The Nordic welfare system 2.0 could function as a steppingstone for a BSR health and wellness approach benefitting the whole BSR population.

In order to optimize the AHA approach as a societal solution and boost its economic advantage we can benefit from mapping the health start-up industry. The health eco-system is exceptionally diverse when considering the supporting, regulatory, and funding entities that it includes. Several BSR cities have collaborated in mapping the most important players in the industry, as they provide support start-ups specifically focusing on the health and wellness sector. Helsinki as a hotbed for innovations and the region of Helsinki-Uusimaa values the aim of a well-connected start-up ecosystem. This is particularly true for health

and life sciences start-ups as the fastest-growing industries in the region are health and neurotechnology. The University of Helsinki, Aalto University in Espoo and the Cities of Helsinki and Espoo set a common goal in 2016 to develop the region into the best Northern European hub for life science, health-related innovations and business development. This decision was based on the numbers of organisations, hubs and accelerators dedicated to the health sector. Players such as Health Capital Helsinki, Terkko Health Hub and Upgraded contribute to strengthen the connection within the ecosystem, accelerate innovations and attract foreign investments and companies to partner. Helsinki's trust-based atmosphere allows collaboration between the public and the private sector to run smoothly.

While Finland is one of the few countries in the world that has developed a nationwide network of biobanks the capital region has a lot to offer in terms of research and development and taking advantage of funding opportunities and a great experimentation infrastructure. Key research sectors in the area include oncology, ageing, neurotechnology, food chain and microbiome. Health Capital Helsinki follows the ambition to build the greatest health capital by boosting collaboration in its health ecosystem and by enabling start-ups to emerge and innovation driven companies to grow. The alliance supporting Health Capital Helsinki consists of major cities, hospitals and educational institutions in Finland as part of the regional eco-system depicted below in the form of a metro map.[7]

The Health Capital Helsinki operates to develop and promote its unique ecosystem the Health Capital Helsinki attracts collaborators and investors within health and life sciences. By catalysing the formation of new start-ups, growth companies and investments its aim is to accelerate the development and maturing of life science and health tech start-ups. This however is only possible when integrating other regions and fostering larger cross-regional collaboration which helps increase the number of relevant collaboration projects and funding schemes. This is why Health Capital Helsinki is a major driver in mapping the ecosystems of other cities and regions which are major hubs in health and life science.

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[7] The Helsinki Health Ecosystem mapping commissioned by the Helsinki-Uusimaa Regional Council, 2020, distinguishes nine lines: Growth Line (Accelerators, projects and hubs which offer services for start-ups on their journey of accelerating their businesses); Hub & Community Line (Multiple organizations, associations, and networking hubs whose aim is to provide for start-ups office and co-working spaces as well as labs, event spaces, networking events, training); Health Hub Line (Multiple organizations, associations, and networking hubs whose aim is to provide help for start-ups specifically providing their solutions on the fields of health and wellbeing); Corporate Line (The corporates which offer challenges, cooperation, funding or even physical hubs for start-ups and small size companies); Support & Expertise Line (Accelerators, projects and hubs which offer services for start-ups on their journey of accelerating their businesses); Funding Line (gathers options on private funding and collects public institutions and entities that can offer funding for development, internationalisation, expansion or projects); Hospitals & Test Labs (The players with whom start-ups can test and verify their solutions on the clinical level and that can serve start-ups as the entry points to public healthcare institutions); Education Line (The educational institutions which offer study options supporting or specifically focusing on fields that are related to healthcare); Event Line (Accelerators, projects and hubs which offer services for start-ups on their journey of accelerating their businesses).

Currently the Nordic capitals Stockholm[8], Copenhagen[9] and Oslo[10] have been mapped in addition to Helsinki, and the work will be expanded into BSR regions.

The Nordic research environment encourages teamwork, collaboration and innovation. It is important to extend intra-regional and cross-regional cooperation in the BSR and leverage from the well-connected eco-systems already in place between research institutions, university hospitals, pharmaceutical companies, biotech start-ups, technology companies, service providers and other health organizations. An advantage in the Nordics is that laws and regulation are transparent, and the actors as well as citizens can rely on a well-functioning system for ethical approval. While the Nordic regions are home to some of the best life science and medicine universities there is a strong connection between academia, industry and the healthcare sector.

In addition, the Nordics include easy access to accurate and comprehensive medical data, and strong involvement of the population in clinical trials and medical research participation. However, it is important to remember that the macro area counts as favourable for a drug pipeline, research and development investment and quality infrastructure, such as IT devices, MedTech devices and clinical equipment, this is done on the basis of a strong principle of making health and well-being accessible to everyone. Therefore, successfully encouraging innovation in diverse sectors such as biotechnology and pharmaceuticals, MedTech,or cleantech goes hand in hand with Smart City solutions with the aim to ensure citizens' wellbeing of all ages. Active Healthy Aging is foremost a human-centered effort to create prosperity in cities and regions that results in healthy communities propagating a good life.

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[8] Stockholm with its reputation of being a unicorn factory is the second-best producer per capita in the world after Silicon Valley. Besides banking, financing and IT, life-science is one of today´s strongest industries in the Stockholm region. Investments have been made in hospitals and ground-breaking research infrastructures, such as the renowned Karolinska Institute, as well as in providing access to large medical databases, registries, biobanks and patient population. The culture of creation and innovation starts in the city´s education system, which highly promotes entrepreneurship. Stockholm's key expertise includes diverse areas in healthtech, biotech, MedTech and pharmaceutical. Some of the city's strongholds include neuroscience, stem cell, metabolic diseases, cancer, molecular bioscience, ageing and diabetes.

[9] Greater Copenhagen is part of the transnational Oresund Region, which includes the Skane Region in Sweden. The ecosystem of the two countries is well connected forming the life-science cluster Medicon Valley Alliance (MVA), the largest life-science cluster in the Nordics. It gathers Universities, hospitals, and some of the largest pharmaceutical, MedTech and biotech companies in the world. Copenhagen is a world-leader in clinical testing and drug development. The region's strongholds are cancer, diabetes and metabolic diseases, neurological disorders, inflammation, allergy and autoimmune diseases. Within MedTech, the strongholds are disposables, diagnostics, hearing devices and assistive technology. Copenhagen is home to TechBBQ, the biggest startup and innovation summit in Scandinavia.

[10] Oslo has a long tradition of research and development in health and has during the last two decades seen an upswing in the number of biotech start-ups. Oslo's science parks, incubators and research facilities are part of a well-developed health startup and life-science eco-system. The health industry's key sectors in the region include oncology, immunotherapy, diagnostic and MedTech. The Oslo Cancer Cluster, Innovation Park and Incubator are the key organisations that gather the entire oncology value chain. Global pharmaceutical companies support start-ups through different collaboration opportunities.

Figure 1 Active and Healthy Aging Network Mapping for Helsinki-Uusimaa

Climate Change and Plastic-free Baltic Sea Region

The Baltic Sea regions are putting sustainability at the top of their agenda. There are several regions in the BSR which operate according to a green mindset and which host a world-class research environment. Finland, Sweden, Denmark, Germany, Estonia, Latvia are already generating sustainable solutions for various industries and administrative areas. Poland, Lithuania and Russia are steadily working towards creating opportunities for innovations with sustainability as a development focus. BSR cities are preparing and implementing action plans to adapt and mitigate climate change based. This means linking and upgrading infrastructures, technologies and services in key urban sectors (transport, buildings, energy, ICT) in a smart way which will improve the quality of life, competitiveness and sustainability of our cities. We can find this is an aim in several high-level cross-regional initiatives, i.e. in the Cities Science Initiative (CIS), or the Global Covenant of Mayors for Climate and Energy.

Today 78% of European citizens live in cities and 85% of the EU's GDP is generated in cities. Already today cities generate 80% carbon dioxide emissions. Many European cities are forerunners in the much-needed transition towards a low carbon, resource-efficient and competitive economy. Sustainability is so much more than a buzzword in most BSR regions. Finland, for example, aims to transform the country into a "socially, economically and ecologically sustainable society by 2030". It has been a long-term commitment to sustainable development, and it is starting to bear fruit.

According to a recently published UN voluntary agenda review from the Finnish Prime Minister's Office[11], the country is close to achieving many of the United Nations' 17 Sustainable Development Goals (SDGs) and is increasing its efforts with its goal of becoming carbon neutral by 2035. On a global scale, five of the top ten countries in the Energy Transition Index 2020 are from the Nordics. All Scandinavian countries and Finland are represented with Sweden in the lead. The 2020 Forum[12] compared the energy sectors of 115 countries in terms of their readiness to adopt clean energy to meet climate targets. As Finland is one of the leaders in the transition from fossil fuels to more sustainable energy sources being ranked third after Sweden and Switzerland, we can briefly look into what this means.

Finnish regions work intensively together with businesses in order to enhance the opportunities for industry to do its part in tackling the climate crisis. This is done by adopting sustainable resource management   practices driven by climate awareness. 2020 marks six large Finnish corporations among the Corporate Knights' Global 100 list of the world's most sustainable companies, together with five Danish corporations and three Swedish corporations. Two Danish corporations and a Finnish one are among the top three, while nine Nordic firms are among the top 40.[13]

While renewable diesel produced by Neste produces up to 90 % less greenhouse gas emissions than fossil diesel, inspiring planet-friendly solutions are emerging. Along established businesses also Finnish cities put sustainability into practice. The City of Lahti, 90 km north of Helsinki, for example received the European Green Capital Award 2021[14], and is among the many Finnish cities at the forefront of urban sustainability. What positions Lahti among the five most forward-thinking European cities, is the city's app-based trading scheme for personal traffic emissions, as well as its innovative solutions for waste management and water conservation efforts.

Nordic universities are also key actors in contributing with solutions to global challenges and contribute to social, environmental and economic wellbeing. The Impact Ranking by Times Higher Education which assesses 768 universities against the United Nations' Sustainable Development Goals (SDGs) has taken note of actions taken by several Nordic universities ranked among the top[15] of those committed to realise the UN's SDGs. The contributions of

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[11] https://sustainabledevelopment.un.org/content/documents/26261VNR_Report_Finland_2020.pdf

[12] https://www.weforum.org/reports/fostering-effective-energy-transition-2020

[13] 17 https://www.corporateknights.com/reports/2020-global-100/2020-global-100-ranking-15795648/
Danish companies, Orsted (1st rank), Chr. Hansen Holding (2nd rank), Novozymes, Vestas Wind Systems, and Novo Nordisk; Finnish companies, Neste (3r rank), Outotec, UPM-Kymmene, KONE, Metso, and Kesko; Swedish companies, Ericsson, H&M Hennes & Mauritz, and Skandinaviska Enskilda Banken.

[14] https://ec.europa.eu/environment/europeangreencapital/winning-cities/2021-lahti/

[15] https://www.timeshighereducation.com/rankings/impact/2020/overall#!/page/0/length/25/locations/SE/sort_by/rank/sort_order/asc/cols/undefined

scientific research to sustainability solutions plays a crucial role in the regional ecosystem producing for commercially viable solutions provided by industry and universities of the BSR can build on the eco-system which is already in motion. Universities in the Baltic Countries and in St. Petersburg are increasingly engaging in multi-stakeholder collaboration.

Also, the involvement of the national research institutes needs to be noted in the field of sustainability and climate change, as synergies are created regionally as well as cross-regionally. As an example, innovative material which can be used similarly to plastic but is 100 percent environmentally friendly and recyclable is
developed by VTT in Finland. This research is focussing on finding solutions to the global plastic waste crisis. Hence, the development of viable sustainable alternatives to traditional plastics, especially those used in packaging, is one of the priorities, in collaboration with local, regional, and inter-regional industry, such as Arla Foods, Paulig and Wipak.

The best practices in the Baltic Sea Region can be the basis for other regions to develop actions for upgrading their Smart Specialisation integration of climate related priorities. Similarly, the constant developments through Smart City innovations across all BSR countries and Smart Ports in coastal maritime areas and harbour cities indirectly contribute to climate related improvement and circular economy solutions, thus they are part of the realisation of SGDs in the regions.

Implementation of innovations is enhanced when regions and actors in the Baltic Sea develop partnerships among each other as well as at EU levels. The actions developed in collaboration can lead to local and inter-regional action plans that serve as a relevant resource for diverse BSR partners to develop their own plans more efficiently when adapting the focus to their regional needs. This can be done by addressing different areas of the urban settings, e.g. the building stock, energy systems, mobility, climate change, water or air quality as activities in these areas are expected to have profound economic, social and environmental impacts, resulting in a better quality of life, competitiveness, jobs and growth.

Circular Economy

Circular economy has been identified as one of the important pathways to reducing the effects of climate change yet at the same time maintaining economic activities and increasing economic, social and environmental capitals. The major approach offered by circular economy is being restorative and regenerative. This builds on rethinking waste and finding synergies between economic actors and regions. It also requires system-wide innovation, since such approaches cannot be embraced by actors in isolation.

The European Commission has established an ambitious agenda to transform the EU economy into a circular one. Circular economy offers significant advantages in addition to the environmental benefits of reduced carbon emissions, or cleaner production. It includes larger economic profits and social advantages, such as healthier living and the creation of new jobs. Transition to a circular economy requires an entirely new way of thinking, as well as a new approach to process and product design.

A transformation from a linear to a circular economy does not only enhance resource efficiency, but offsets losses in the labour market e.g. due to automation and secures gains in employment through new jobs. Therefore, several initiatives in the BSR have been directed to promoting circular economy through cooperation in the region. These include the European Union Strategy for the BSR (EUSBSR) and the Council of the Baltic States (CBSS). Together they have established that challenges are best solved when working together. Most importantly, through cross-regional cooperation a more balanced development among BSR territories is also achievable. Circular economy covers all aspects of human behaviour and operations. The need for circular solutions in all aspects of society has risen in awareness in the BSR. Such solutions are recognised to affect several urban challenges beyond waste management. They encompass consumption, production, industry, and urban planning to mention a few areas. As only a few percentages of the original product value are recovered after use and the Baltic Sea carries the consequences of the environmental burden, a change of course from linear to circular is urgent in the BSR.

In concrete terms circular economy affects the cycle from production to consumption, and tackles waste management by creating a new market for secondary raw materials. Circular economy maximizes the use of materials and retains their value for as long as possible. A circular economy is based on the use of services and intelligent digital solutions, and the design and pro-duction of more durable, repairable, reusable and recyclable products. Waste is regarded as a valuable resource. Products are shared, leased or rented, rather than owned by an end user. Smart City solutions can put this into effect.

As a societal framework and economic approach, a circular economy assimilates theopportunity to integrate the 2030 Agenda SDGs in all aspects of urban daily life. As demonstrated in the Circular Baltic 2030 report the BSR can showcase regions that promote circular economy solutions not only for realising resource efficiency, but also for attaining social benefits in several aspects. The report also suggests that "a shift towards a more circular economy will be crucial for the region's possibility to meet the United Nations 2030 Agenda and its SDGs".

As circular economy has the potential to solve the world's mounting waste problem, it can minimize negative effects on the environment, and increase system efficiency. These

aspects are included in the Agenda 2030 and its SDGs but achieving these goals will be the result of including the SDGs as a framework affecting everyday behaviour and attitudes. Achieving SDGs will be the result of cities designed with circularity at their core, which this goes hand-in-hand with social goals and business opportunities.

While some countries in the BSR are recognised as frontrunners, collaboration is especially relevant for balancing the level of pollution in the Baltic Sea. Transition requires a determination to collaborate. Challenges include making the internal, regional and cross-regional business case for circular economy, updating antiquated public policies to promote circular strategies and educating consumers about the merits.

The Baltic Sea Region includes a number of countries which have included measures towards sustainability in their strategies and are considered to be amongst the best positioned to deliver on the 2030 Agenda and to reach the SDGs, including the global Paris Agreement on climate change and the New Urban Agenda. Therefore, pilots in circular economy solution in the BSR can continue to offer good examples and introduce best practices to support a circular transformation.

Some examples of innovative circular practices are incorporated in Smart City innovations that transform management of waste and resources and reshape attitudes of consumers and citizens. These examples can be found in the pilots of several of the BSR regions represented in this study. While regions like Helsinki-Uusimaa, with cities expediating the carbon neutral agenda stand out as internationally renowned examples of how the circular transformation already is advancing, regions are at different stages in acquiring circular economy competencies in the BSR and therefore may need to increase concrete pilots on circular economy.

The need for more knowledge and inspiration is still necessary for a circular approach to be integrated across sectors, at different levels, and as the core of sustainable development in the BSR.

Pilot activities that inform this study were targeted to increase awareness of the partners and to get the BSR regions and cities to accelerate the desired change towards circular economy. Change can be accelerated by getting the latest knowledge and providing access to best applications through cross-regional collaboration. In addition, regions can benefit by participating in the European Circular Economy Stakeholder Platform jointly launched by the Commission and the EESC. The Platform is a hub gathering knowledge on circular economy and a place for dialogue among stakeholders.

The need is evident to work in co-operation with many actor groups across society to develop a circular economy. However, circular economy is an excellent example of a theme on which BSR inter-regional region alliances or, on a wider scale, European partnerships, can

accelerate implementation of strategic priorities. Businesses, public administrations, research organisations, start-ups and the media are among the stakeholders that by working in collaboration can fast-track circular economy in society. An estimate of what this change may mean in Finland is that by 2030, the added value provided by a circular economy for Finland's national economy could be at least 3 billion euros per year.

Urban Challenges Through Smart Cities and Smart Ports

In a similar way to circular economy the Smart City is a cross-cutting issue. Therefore, it is crucial to develop a good understanding of the relation and linkages of all the different urban dimensions and actors. The main target of Smart City and Smart Port as a group of activities is to act as a cross-sector framework, identifying and disseminating best practices helping regions to tap into the growth opportunities offered by the Smart City concepts.

About two thirds of the population in the Baltic Sea Region lives in urban areas and the number is expected to rise. The high use of resources in cities calls for sustainable development of urban areas. This requires new, efficient, and user-friendly technologies and services, in particular in the areas of energy, transport and ICT.

The European Commission reacted to the international Smart City movement in 2012 by setting up the European Innovation Partnership on Smart Cities and Communities (also known as the Smart Cities Initiative) as a cross-cutting activity.

Though best practices created, collected and analysed with Smart City projects function as a basis, as useful for regions to develop actions towards upgrading Smart Specialisation implementation and development of opportunities for innovations shared among the partner regions and actors in the Baltic Sea and EU levels. The actions developed can serve as a relevant resource for project partners to develop their own plans adapted to their regional needs. With the help of these activities some partnering regions can develop their roles to become strong, not just in the BSR but also on a European scale.

Baltic Sea Regions conducted cross-regional pilots in Smart City development, including innovative digitalisation to empower life in the city and services development for citizens and businesses, i.e. including traffic, transport, and logistics.

The European Capital of Innovation Award iCapital criteria and challenge provide an easily adoptable Smart City principle. It is interesting to note that in 2017 six out of the ten finalists were BSR region cities.

Therefore, the Smart City pilots can be recognised with the following elements and activities that aim at:

- Experimenting innovative concepts, processes, tools, and governance models,
- Functioning as a testbed for innovation,

- Engaging citizens in the innovation process,
- Ensuring the uptake of the ideas provided of citizens,
- Expanding the city's attractiveness to become a role model for other cities, and
- Empowering the local ecosystem through the implementation of innovative practices.

Smart Cities as a term and concept has been a valuable for many years, allowing for a shared frame of understanding and a powerful international agenda for developing and testing technological solutions and new partnerships for urban development. However, the Smart Cities concept is also ambiguous, and it can be argued that it is so broad that it covers everything and therefore nothing, which makes it difficult to operationalize.

As an example of the diligent step-by-step local efforts in numerous municipalities in the BSR we can the work required from the municipalities: to constantly explore, test and implement (IoT, AI) solutions, e.g. by installing sensors in waste bins, setting up IoT networks in municipal buildings, measuring the indoor climate in multiple buildings, or counting cyclists on the local mountain bike routes. The work is often driven forward by citizens and start-ups as much as by public authorities Sparring with other municipalities that have tried similar solutions is done formally and informally. [16] Alternatively, the activities can also be initiated by local suppliers and consultants, eager to establish test solutions, representing local knowledge and entrepreneurship. This describes how change and innovation has been emerging in several cities and port areas around the BSR.

In Annex II concrete example of cities that are using the Smart City and Smart Port theme to innovatively transform the approach to regional development are showcased. The pilot activities related to the Smart City vision of the city of Aarhus, Tallinn and St. Petersburg for Smart City, and Riga, Klaipeda and Kymenlaakso for Smart Port, are a good example of how cities and regions are engaged in collaborative activities to reach an inclusive and sustainable transformation.

4. Innnovation camps Smart-Up BSR participants' learnings

The methodology quick guide that was produced in this project summarized the actions taken before, during and after the Innovation Camp through an illustration. The illustration below has the key components involved in creating and implementing an Innovation Camp structured in four domains of Why, What, Who, and How.

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[16] Some Smart City activities in the Baltic Sea Region: (Tallinn) https://www.tallinn.ee/ee/eng/tallinovations/Open-the-City-Application, https://www.facebook.com/mitte.tallinn/ and dashboard.tallinn.ee; (Riga) https://www.vefresh.com/home; (Aarhus) https://www.smartaarhus.eu/node/196 and https://www.smartaarhus.eu/node/196; (Denmark) www.opendata.dk; (Helsinki) https://hri.fi/en_gb/ and https://forumvirium.fi/en/air-quality-matters-join-the-air-quality-troops/; (St. Petersburg) http://bertholdcentre.com/ and https://www.artplay.ru/; (Sweden) https://en.viablecities.se/

Participants in the several cross-regional Innovation Camps that took place in each region were asked to describe their experience based on the illustration. This was done we the intent to trigger comments that would be helpful for the practice of Innovation Camps for regional development and place-based innovation systems. The power of the Smart-Up BSR Innovation Camps comes from the work that was done with cross-regional participants. This was an example of how fruitful multi-stakeholder participation can be and presents a case-in-point for the Innovation Camp as an instrument for place-base innovation systems that build on inclusive practices.

Figure 2 The four action domains of Innovation Camps

In responding to this picture following the Innovation Camp participants were asked to what extent this illustration captures their experiences.

What recommendations you would give to others who are planning to use the method?

What are your lessons learned or recommendations regarding the **WHAT / WHY / WHO / HOW** aspects pictured above?

WHAT

Figure 3 - What is required to enable local action?

♀ We didn't have a challenge case of our own in the innovation camps, but I learned a lot about the cases of other regions. It also showed that we have similar practical challenges in the BSR regions.

♀ The camps provided a possibility to discuss with peers in general. In the challenges we could get deeper into details and discuss the real-life practices, processes, and possibilities within the subject area of the case. Sometimes it is about the learnings and how they can be put into practice right away, sometimes it is was more about building capacities for the future.

♀ The Innovation Camp is a great tool for exploring and finding new ways to solve challenges. The Innovation Camp brings together business, science and societal actors with different backgrounds, competences and experiences. Each representative has the opportunity to present their idea regarding the challenge to be solved. Innovation camps needs experts who can put together teams and who can evaluate the new ideas that are provided. The insights of the experts are important to reach an effective outcome of the innovation camp and channel the ideas into the right direction for the region.

♀ Our pilot considers the following actions important:

- Clearly identify challenges that are relevant to the region / all regions (if the camp is cross-regional);
- Gather the widest possible audience involving representatives from science, business and government;
- Mobilize experts of the highest possible qualification.

♀ A group, of as diverse as possible, have to find innovative ideas. There is lots of strength in collective knowledge, especially if you work in an international environment.

It has been interesting to see that the challenges of the different regions are very similar to each other. Different political focus seems to have steered each region towards different solutions.

The exchange of local culture during the camps was interesting. This primarily happens within the 'gaps' of the innovation camps e.g. during social activities, dinners, or travel time.

The most significant from my perspective in innovation camps is exchanging of expertise and practices which leads to look out of the box. I think the collective knowledge reflects my thoughts more fully.

Innovation camps address and tackle both local and global societal challenges; enhance regional, inter-regional and international collaboration; strengthen and boost innovation capacity.

To put it simply – a very heterogenic group of people of all backgrounds, ages, sexes, colors, educations, walks of life and nationalities get together to have a blast on innovation! The end results tend to be very interesting, thought provoking and unexpected thanks to the use of design thinking methods.

For me personally the best phrase to answer the "what" question was the one which said that camps are entrepreneurial discovery processes.

WHY

Figure 4 - Why do stakeholders act and push action forward?

In general cross-regional innovation camps are a good way to get to know with colleagues from different regions and discuss multiple possibilities to work towards solutions and different ways to reach results.

Concerning the challenges which are tackled in the innovation camp it is relevant to get together a group of people with wide experience and give them the space to concentrate on

finding the solutions for your challenge. A project like Smart-up brings together the kind of expertise you might not have reached otherwise.

💡 When having the innovation camp in your region there is the possibility for all participants and experts to experience the real environment and therefore become aware of different aspects relevant to the case and the challenge to be solved. To get the best out of this opportunity local challenge owners need to be present. (KHP)

💡 Every country in the Baltic Sea Region has challenges related to Smart Specialization and its implementation. The Innovation Camp is an event that provides concrete answers to the posed challenges. Our experience shows that even a mini-innovation camp as it organized in Lithuania can bring results, and the results were excellent. We, the authors of the challenge, got ideas on how to effectively use innovative tools to solve the challenge. Together with the participants of the innovation camp, we managed to put together an action plan to solve the challenge.

💡 Our experience clarifies why innovation camps should take place, the results observed were:

- A positive influence on the process of solving the local challenge;
- An action plan to the concrete challenge easily reached;
- An insightful sharing of practical experience between regions.

💡 One of the most important WHY aspects that I discovered was related to creating a network. Not only network of participants of the camp (which is very important), but also a network of ideas, ways of doing, challenges. Knowing that other partners in BSR have similar (or then again quite different) experiences regarding the 3S, helps putting one's own experience in perspective.

💡 Innovation Camp is held to develop new solutions, it is also a great method to involve new people, e.g. from other industries. When the group is diverse, the value of new solutions increases. The international formula of the Innovation Camp is also a great opportunity to learn from each other, use the already developed practices, as well as inspire and give each other the driving force to introduce new products or changes.

💡 To network and bring in new perspectives on shared challenges, we did not see challenge obstacles being eliminated during the camps, however they were reflected upon. The camp also seemed to work well as a format to bring in international discussions to the local level. International awareness was possible about local challenges (but also opportunities, form the tours around region).

💡 I think that innovation camps give possibility to find innovative solutions for local problems taking into account the regional context and to come to the decision towards a challenge by concrete steps.

💡 Innovation camps are held when all relevant key stakeholders are committed to participate and contribute; when challenges / problems which need to be solved are

complex; when you need fresh ways of thinking and doing things (novel ideas and new insights).

♀ Because it's just not possible to come up with anything truly great in a vacuum by oneself – but through interaction and pro-action – and action!

WHO

Figure 5 - Who do the actions serve, who has the competence to act?

♀ It is good to have a wide range of participants in each innovation camp, all of them provide a relevant contribution. Having participants from different organisations and backgrounds gives a wider perspective to understand the cases and a broader range of innovative solutions can be considered.

♀ From the participants point of view, it is good to know the program, process, and timetables beforehand. It is also good to bear in mind that there will be both extroverts and introverts participating. To get most out of the diverse group of people this is taken into consideration when planning the methods used.

♀ The picture sums it up really well! I'd also add experienced people and enthusiasm to it as well.

♀ In order to achieve the most effective result and not only meet expectations but achieve the optimal solution for the challenges it is very important that the people gathered will not act as an audience, but they will actually participate in the innovation camp. The organizer of the Innovation Camp should understand that the aim is not the largest possible number of participants, but the participants should be representatives of different fields with different experience and competencies. Our experience showed that the innovation camp achieved the great success due to two factors: first, the specialists chosen according to the expertise in their fields and second, the moderator who was able to facilitate looking at the

challenge from different angles, to mediate when finding the best solutions, and to guide the process of putting them together into an action plan.

💡 By participating in other innovation camps, we have seen that solutions of challenges are seen differently not only by representatives of different competences and fields, but also by participants of different age groups. Today, the involvement of young people in such events is very important, as the new generation contributes with different views to the decisions/solutions.

💡 It is not only diversity in a socio-economic aspect, but it is diversity in terms of background experience and approach. On the other hand, people who have been in camps several times, seem to be quite aligned – they know what to expect from a camp and what is expected from them and act accordingly. Perhaps it is inevitable that the freshness of diversity goes away if the same kind of people get used to each other.

💡 When inviting participants of the Innovation Camp, it is worth considering who will be involved at which stage of implementation of the developed idea, and who has an impact on the planned change. It is also valuable to invite different groups of beneficiaries, e.g. when we want to check immediately whether the solution will be suitable for them or not.

💡 It gives a different dynamic to innovation processes when there are all levels of stakeholders represented. Some of the lessons learned might be that the more senior or VIP profiles tend to leave the camp after the first half day, which often leaves students or other partners. It was good to have a global thought leader present to bring up challenges to a more global level and also to present international opportunities to continue the work with overcoming them.

The young age group (from the Youth network) was inspiring to have on board and experience their motivation to change the world for the better. It gave good energy to the rest of the participants.

It is important to have facilitators on boards that know how to manage the groups and the internal power structures. Otherwise the experience was the more senior or alpha would steer the discussions.

There is a need to have more end-users on board of the camps, so we could have asked them more about the challenges. Often it was a representative from the city or region that presented the challenges experienced the companies of the citizens in the region.

💡 It is important that participants are divers in many ways – it improves chances to create really new ideas, relationships, and collaboration. It is also crucial that IC facilitators are professional and experiences in their job. If not, concrete results and benefits might be hard to reach.

💡 I consider that to engage representatives based on Quadro Helix principle brings advantages to look at a challenge from different angles. Combining experience of various

experts, decision-makers and citizens allows to look at a challenge completely and avoid distortions.

HOW

Figure 6 - How do instruments lead to results?

💡 In the original idea of innovation camps the challenges were tackled by a self-organising group of experts. In my experience it is more useful to have a facilitator and someone with deep knowledge of the case in the group. This helps reaching results easier to use for the case owner, yet the results can still be quite out-of-the-box.

💡 "I liked the way we used different methods of facilitating in different camps. It gave the possibility to learn and use new methods in practice. These skills are useful in the future as well".

💡 The most important aspects of the innovation camp are the participants, internationality, challenges, experts, the result achieved. To achieve this, it is necessary to combine all available human and financial resources, as well as to invite to join the partners and all our networks.

💡 Disseminate information about the event as early as possible and the program of the event should be laid out for a period of 2-3 days. The best result is achieved when the holder of the challenge makes a presentation at the innovation camp or organizes a visit for the participants, where challenge owners can visually present the relevance of the challenge. It is important to explain to innovation camp participants what is the purpose for which they are gathered, and what the organizers and challenge owners expect from them.

💡 When inviting the moderator/main expert to the event, the organizers must explain what is expected from the innovation camp moderation: the moderator has to provoke teams by asking triggering questions, and by applying various methodologies of analysis in the brainstorming.

💡 Our experience shows that intermediate presentations of team results to other teams and experts are significant and give a vital boost. During these interim presentations, the

teams receive insights on other solutions by other participants that give a significant towards a feasible solution.

💡 It is important to emphasize that there are no bad ideas or thoughts – what is important is to discuss, analyse and create an action plan that is acceptable to everyone.

💡 Good to have the elements of the methodology (length of camp, active engagement, disrupt, play, provoke etc.). Prototyping I understand is one of the most prominent outputs of the camp, it should not be marginal but central, surrounded by some other concept. This has been my experience in camps.

💡 The formula of working on solutions, preceded by an inspirational visit related to a specific challenge, proved to be very successful. It is extremely important that each participant has a good understanding of what the challenge is about and understand it by seeing a specific place. The role of the challenge-owner is also important to present the challenge well, and also inspire and motivate participants to continue working on it.

💡 Challenges should be followed up on. There should be continuation between the camps, so same ideas are further developed. It is good to have the groups close to each other in break out rooms or in a big enough room, where they do not interfere with each others' focus, but keeps their presence close so you can follow the other groups progress and share informal knowledge in the coffee breaks.

Short camps provided less value than the 3-4 day programs. Especially when there was left room for doing activities outside the group work e.g. see historical sites or visit local companies. It was interesting to see new methods being applied for the camps in each region. This gave us some new tools that we have incorporated into our existing "tool kit".

💡 The winning aspects is that the Innovation Camp methodology was complemented each time by creative tools. This allowed to "wake up" the participants and invent new solutions for the proposed challenges.

💡 • When you are committed to work and contribute during Innovation Camps it is really hard work.
• Well defined and formulated challenges are essential for Innovation Camp work.
• Facilitators must be professional and experienced in their job to reach concrete results.

💡 Don't rush! Use more time, and enjoy before letting the process move to the next stage. Every stage is an exciting journey - and when journeying the road is the purpose. Don't think about getting there, or you never will!

5. Analysis

As described in previous chapters a fundamental challenge is how regions in the Baltic Sea Region can provide solutions to grand societal challenges. This includes contributing to citizens' wellbeing, promoting youth networks and active healthy ageing, exploring smart and inclusive use of technology, and confronting climate change. A strategic goal for the entrepreneurial cities and regions in BSR is to attract relevant businesses inclusively and to do so by applying cross-regional collaboration in policies and actions.

This report analyses the actions taken by the BSR regions participating in the Smart-Up BSR project. Our intention is to unwrap from the observed pilots what capacity gaps the regional actors are facing.

Strategic capacities can set cities and regions into motion to engage and develop their local industry strategies while addressing them cross-regionally and internationally and at the same time tackling shared societal challenges.

We begin by establishing what are the targets, policies and methods that lay the ground for regional and local pilots to be launched. Targets are guided by a focus that aims at economic development policies through specific methods. By means of the effectuating processes of change management and capacity building in the thematic analysis, targets, policies, and methods have been evidenced as outlined in the following framework:

TARGETS/POLICY/METHODS	Goals towards	Focus on	Methods for	Policies for
1. Smart Specialisation (policy for economic transformation)	shared and complementing expertise that ensures growth	local priorities and constantly creating new strengths	triple and quadruple helix	supporting exchanges, revisions, updates
2. Smart Specialisation (as a means for SDGs implementation)	- build up for future global and local challenges - ensure stability	aligning SDGs and into a coherent local and regional strategy	regional integration by research, industry, civil society	societal change readiness for unknown yet promising future
3. Entrepreneurial Mindset	improvement driven by experimentation	- organisational change management - competencies for enabling and monitoring action	support of wide range of mission-driven local actors and international partners	-enabling action -monitoring results -supporting creation of new solutions
4. Evidence-based Policy Making	- provide better results that can be followed-up - allow easier adjustments - give a tangible framework to build on	transparency communication data support	public actors and industry collaboration based on data	-enabling multi-level and multi-methodology data use

Table 1 - Targets/Policies/Methods framework for regional change management

This set of strategic undertakings have served policy makers in their challenge to manage change towards achieving results locally. The reference framework represents competitive

landscapes that integrate different modes of innovation as well as various knowledge bases in local-global interaction.

In the represented BSR regions a review process was launched in which the responsible organisations prepared, conducted, and then reflected and evaluated their pilot actions. This included a reflection on the how to concretely adopt in their region innovation activities within the Smart Specialisation strategic themes.

Innovation camps were used to take part in cross-regional group activities around Circular Economy and Boosting Entrepreneurship, Smart City innovative solutions development, Active and Healthy Aging eco-system mapping as well as to develop an integrated innovation support infrastructure by engaging SMEs in the open innovation process. Collaborating around boosting innovative entrepreneurship ecosystems in regions means can add the bonus of creating opportunities for young entrepreneurs and youth start-up.

The joint intra- and inter-regional activities which have proven to be beneficial in boosting pilot related actions include shared experiences in the process of

- mapping thematic ecosystems and the achieved results in order to revise planned actions,
- conducting peer-to-peer reviews and raising awareness, and
- training in order to build competencies.

The assessment of the pilot actions was done in eight regions of Baltic Sea macro-region: in Denmark-Aarhus, Estonia-Tallinn, Finland-Helsinki-Uusimaa, Finland-Kymenlaasko, Latvia, Lithuania, Poland, and St. Petersburg. Results and key reflections by individual regions are summarized in Annex I. The organisations and institutions participating in the Smart-Up BSR project pilots have assessed their work from the perspective of the importance of the pilot for their region, what role their organisation has played during the implementation, and how regional strategic actions towards economic transformation have been systematically implemented in their pilot activities.

Results of the Analysis

In order to go deeper into the reality of strategic implementation at local and regional level we need to acknowledge the intense work that is being done by regions and cities.

Regional actors may not all be able to resort to qualities and competences necessary for an entrepreneurial approach to regional development led by innovation. Instead, when lacking the tools to for an entrepreneurial approach, regions follow traditional paths which tend to apply digitization to governmental operational issues but are less equipped to push through an entrepreneurial approach.

The following assessment can assumingly be shared by most municipalities in the BSR. When implementing evidence-based approaches "...municipalities have doubts about which direction to go, what technologies to focus on, where to buy the right equipment, how data is best processed and presented, and which technology providers are the right ones to collaborate with. The experience across public authorities is such that there is still a great task - political as well as practical - in describing potentials, allocating resources and coming from pilot project to large scale solutions". To realise this and understand how to face this challenge cities need actions. However, it is through actions that impact is created, and consequently new elements of governance are introduced, of urban challenge dialogues are conducted, technology solutions are tested. Also, through actions stakeholder engagement is leveraged, of business collaboration is orchestrated, and impact on citizens inclusion is created, as well as capacity is being built.

Strategic Diversity and Strategic Alignment

A closer look at pilot implementation has revealed how each region differs while the goals being implemented are common. Regions seem to undergo a process of strategic alignment, i.e. aiming at fulfilling selected SDGs, while operating within their particular administrative and territorial set up. Results can vary based on the region's administrative nature. However, with reference to cross-regions collaboration each region has explicitly stated that they have learned from others. The result of the shared pilots was that events in neighbouring regions and the environment surrounding a region can significantly influence the impact of the resulting strategies.

Nonetheless, despite a favourable outlook towards cross-regional and international alignment the local implementations can diverge. There are differences between a higher-level strategic orientation and its realisation in ground-level project activities. Vice-versa, with their pilots some regions could be moving in the other direction from practical action to high-level policy making. Interestingly, in the pilot executions we could observe how some locally designed solutions could be highly innovative in fulfilling high level transformative goals. Similarly, national pilots were able to contribute to local economic and inclusive transformation. Therefore, we can say that the landscape is varied, and transformation happens through multiple attempts to engage actors in actions that increase the opportunities to learn and build capacity.

Two examples in the Central Denmark pilot point to two sets of actions addressing different needs and requiring different sets of competencies: *Civic Tech* and *GovTech*. *Civic Tech* enhances the relationships between the people and public authorities and in other words provides a tool to build bridges between the citizen and the municipalities. On the other hand, *GovTech* is the public institution's use of radically new technology to improve the delivery of public services through increased efficiency.

While *Civic Tech* technology enables to include citizens in the decision-making process, to make their voice heard, and it allows the sharing of data about the city, *GovTech*

complements the traditional technological infrastructure with emerging technologies. Both allow the municipality to utilize smart city solutions, i.e. digitalization, and welfare technology as well as to include co-creation, public hearing platforms, open data, living labs and citizen science. As different Smart City pilots they rely of different disciplinary knowledge and orchestration capabilities.

With these two perspectives of technology development in mind and based on intense cooperation the pilot organisers concluded that further improvement is still needed to "work towards more coherence as well as community thinking and common direction". Capacity building is in constant process and given the complexity of urban challenges regions need to be constantly testing the actual implications of community thinking and acting. This stands for the realisation that regions are facing the same challenges and that by working together they can make the resources available go further.

Entrepreneurial Communities

Community thinking is a catalyst for action following an entrepreneurial mindset and fostering collaboration between universities and municipalities, businesses and citizens. When observing the city of Tallinn, we find a combination that demonstrates an entrepreneurial approach. Tallinn City defines its goal of developing a Smart City hub in terms of exploiting RDI combined with the practical use of new solutions and attracting companies. This is proven by a strong ICT sector, a lively start-up scene, competitive tradable services, and a trustworthy internet and web environment as identified by the pilot participants as the main strengths of Tallinn and the surrounding region.

Yet, to leverage on these strengths the pilot builds on the efforts of Tallinn City to overcome internal weaknesses. Urban challenges that may appear to be "related to the size, scale and structure (population, economy, resources) or limited attraction in the context of growth & globalisation", can be transformed into successful entrepreneurial action-taking by a push for change in domestic policy. Activities were launched to examine how to expand a community identity that changed awareness. It was noticed that an overlooked tendency to build policy on contraction and enclosure should be reverse and replace by strong collaborative ties in the BSR, to enable a transition and to intensify collaboration both internally and cross-regionally.

The result of clarifying strategic action by intensifying domestic processes in the City of Tallinn towards a more entrepreneurial community and participative identity is expressed in a reflection by the pilot organisers. They recognized strategic action in the pilot as an opportunity to establish contacts with different BSR partners, and in addition, surprisingly, establish closer contacts between the City government and University of Technology.

In regions where port-related activities and business have a long tradition, - such as Finland´s Port of Hamina-Kotka, or Lithuania's Klaipeda Port, or Gdynia Port in Gdansk -, valuable know-how and relationships have been accumulated for decades. When thinking of

the regional ecosystem´s role in supporting innovations in this type regions, what stands out is that "all the relevant innovation actors know each other quite well. The communication and contacting between actors are smooth, fast and straightforward."

This joint practice is an advantage for increasing collaboration. For example, this year, the Lithuanian maritime cluster and the Polish organisation "Gdansk-Gdynia-Sopot Metropolitan Area" as well as several business partners and incubators are partnering for a joint Baltic See Region Hackathon the "Portathon Baltic 2020".

The lessons learned in the port pilots point to competence needs to be filled essential for pilot planning and organising collaborative and open innovation activities. Successful multi-stakeholder actions resulting in innovative sustainable entrepreneurship including circular economy solutions for new port related businesses, have a community building impact.

These planning and orchestration needs are not limited to smaller and specified regions. Even with successful pilot actions in larger hubs like e.g. Helsinki-Uusimaa, Berlin-Brandenburg, or St. Petersburg capabilities are continuously evaluated. In general, all participating pilots confirm that the engagement of a large number of stakeholders when done successfully presented several concrete ideas on how to enrich and enliven their area adding the bonus of a double sense of belonging: on one hand the prospect of a prosperous local future, and on the other hand, the shared build-up of expertise of cross-sector, or cross-regional action.

Cross-regional balance capacity

The piloting exercises boosted the use of Smart Specialisation strategy in concrete ways. The interactive tools gave an excellent opportunity to train competences for predicting future scenarios, pinpoint specific development needs, develop strategic foresight thinking and intensify co-operation and interaction with region´s different innovation actors. From the perspective of smaller regions and port areas lacking regional competences could be complemented with collaborating especially with project partners from port cities.

In addition, capacity building was also a main focus from the perspective of pilots facilitated by national entities. In Latvia for example, the Ministry of Education and Science (MoES) participated with expectations directed towards better solutions for closing skills gaps. Capacity building needs stretched from better management of water resources, to improved education and links between the academic and the business communities, to sharing interdisciplinary urban challenges approaches such as circular economy.

By participating in the innovation camps Smart Specialisation ministerial experts gained insights and knowledge based on concrete societal challenges and their impact on the outcomes to consider. MoES pilot organisers also observe that in the regional context "Sector specific information regularly needs to be updated and monitored." This means "…providing updates on challenges and opportunities to achieve better and more accurate focus and ensure engagement with all the stakeholders (policy makers, R&D sector,

entrepreneurs, students and general public).” Similar to the Latvia MoES perspective there is a clear understanding among actors in several BSR regions that “the future impacts for the Baltic Sea Region are: Cooperation for new project applications (e.g. in circular economy sector) and networking, new contacts”.

Evidently, in some instances cross-border cooperation is already integral to the activities of several BSR regions and is an important priority. Such collaboration is essentially based on the idea that we are stronger together. Research networks and other partnerships in the Baltic sea region can continue going forward and benefit from interpersonal, cross-organisational and cross-regional relationships that shape actions of high value for the future. Nonetheless, each pilot showed there is a need to increase competencies in using tools to share progress, make smart and innovative solutions widely available, and create a community of mutual capacity building.

These elements ensure that results achieved in one region can have a wider impact at the BSR macro-region level. For example, new approaches help to prioritise competences in human, social, and financial resources, and therefore regions could be involved in larger and more wide-ranging projects. Alignment within the BSR macro-region is to be considered the biggest precondition for favourable business opportunities in each individual region.

Through the pilots, regions could observe how pan-regional development can be facilitated through meso-level strategies, e.g. Baltic Sea Region Strategy. A joint community of BSR regions can device policies that provide access to talent within the region, through the EU, and beyond the EU and as the Tallinn pilot concluded, trade barriers can create opportunities in the context of balancing increasing competition from Asia.

The cross-regional advantage was also felt in the AHA-network mapping exercise led by the city of Helsinki. The mapping of networks in different BSR cities fosters both local and cross border co-operation in the Baltic Sea Region. BSR regions will benefit of new visions and collaboration possibilities on the AHA theme.

Concluding remarks

Commenting on Smart Specialisation place-based visions and leadership Sotarauta (2018) raises the point that Smart Specialisation changes the discussion in the agenda of regional development. Smart Specialisation is about “not only policy formulation, implementation and evaluation but also pooling scattered resources, competencies and powers to serve both shared and individual ambitions” (p.191). These two powers, the shared power and the individual power, are equally crucial for achieving results and invite us to see Smart Specialisation formulation and implementation in a double light. In order to realize each region’s selected Smart Specialisation priorities, it is of benefit to scale Smart Specialisation collaboration to the Baltic Sea Region as a whole, which leads to creating a promising pan-BSR process.

Recommendations

The Baltic Sea Region countries progressively cooperate on shared agendas and lead a lively dialogue on joint solutions to challenges in several different constellations and formats. This is partly because multi-disciplinary and cross-sectorial approaches are believed to deliver the most innovative results. Essentially regions in the BSR strive for cooperation towards a sustainable Baltic Sea environment. In this they rely on actions that are guided by Smart Specialisation priorities and the UN SDGs for sustainable cities and regions.

BSR policies and horizontal actions related to shared global challenges are constantly being translated into regional implementation to solve evolving urban challenges. The joint BSR concern for the common sea and for the wellbeing of its citizens shapes the key principles for emerging areas of cooperation.

To this end, while working on multi-level governance BSR cities, regions, and citizens can benefit from a cross issue approach such as city science. A place-based innovation ecosystem approach using city science would provide knowledge of available practices, resources and tools through a 'just-in-time' research approach. Such outcomes would help city and regional development officials to arrive at key urban solutions principles.

Once established through multi-level governance, solutions need to be applied across different stakeholders, across industrial areas, and across territories. Therefore, for implementing a place-based innovation eco-system approach, regions need to employ helpful tools to tackle cross-issue perspectives.

Some of the tools that have been applied in the Smart-Up BSR project such as Innovation Camps, or other suggested instruments guiding regional analysis and strategy implementation or organisational capacity building (incl. the Regional Strategy Diamond tool) are supportive of place-based innovation ecosystems implementation

6. Conclusion

In chapter one and two this report has advocated for cross-regional capacity building as the strategic and actionable impetus that is needed for the Baltic Sea Region to solve its urban challenges and transition to a sustainable entrepreneurial macro-region with the best quality of life. We have analysed Smart-up BSR project pilots that have followed the principle of the multi-level governance by bringing together experts, city practitioners,

regional and national representatives in charge of Smart Specialisation. They have participated in innovation camps and workshops that created interactions and alignment between all scales regional, municipal, and other stakeholders. Furthermore, representatives of pan BSR institutions, EU level organisation, JRC and CoR have been involved in the capacity building process.

Therefore, as a result, the BSR partner regions have reached aspects of collaboration with multi-level actors from cities, regions, BSR and EU level which provided new insights. Some elements of the local appropriation of learnings with regard to multi-level governance collaboration has been achieved within the frame of specific thematic pilots within the four themes of Active Healthy Aging, Climate Change, Circular Economy and Smart City. The result is a holistic understanding of the need of strategic capabilities to develop an integrated implementation of specialisation strategies and roadmaps.

This report has analysed the actions taken by the BSR regions participating in the Smart-Up BSR project, the pilots' paths to experimentation, prototyping and implementation. What we found led us to understand the need for instruments fostering capacity building.

To achieve an economic transformation that includes becoming smart and sustainable a city or region needs competencies and instruments for active engagement and collaboration of all stakeholders. When the ambition is a future inclusive, green, and entrepreneurial Baltic Sea macro-region the appropriate strategic instruments are crucial. After a brief analysis of the regional pilots we present a set of strategic capacity building tools that help regions and cities to focus on implementing the changes leading to smart sustainable and entrepreneurial actions.

The prospects of increasing jobs opportunities within the Smart City and circular economy sectors also highlight the need for more competencies, as well as focused collaboration if we are to improve the abilities of regions to exploit new technology to a new level and achieve their growth potentials.

From a perspective of coordination, there is a strong need to build up knowledge and skills so that the public sector can facilitate collaboration and orchestrate the development in a desirable direction to achieve the anticipated benefits.

If we conclude that macro-region cross-regional collaboration has a key role in successful implementation this prompts us to look for the appropriate instruments that make a transformation possible and lead to a sustainable and entrepreneurial Baltic Sea Region.

Based on the analysis of the regional reflections the following tools for capacity building were identified as significant: the Regional Strategy Diamond, the Organisational Innovation Competency Set, and the Innovation Camps. These tools may be used individually, in combination, or accompany other sets of tools, depending on the regional needs. As we will present in the next chapter, the practical implementation of these collaborative and

capacity building instruments has a strong impact on Smart Specialisation and City Science as frontrunners for action at a BSR macro-regional level.

As our report analysed the actions taken by the BSR regions participating in the Smart-Up BSR project, the pilots' paths to experimentation, prototyping and implementing lead us to propose the use of change management instruments for specifically ensure capacity building in place-based regional development. The learnings from this report and the description of the benefits in actively utilizing capacity building instruments for sustainable and entrepreneurial transformation are compiled in the publication: Baltic Sea Region, Strategic Instruments for Sustainable and Entrepreneurial Capacity Building (Tukiainen and Hongisto, 2020) published on the Smart-Up BSR project website.

ANNEX I – Template for reports on pilots & ecosystem orchestration

A. IMPORTANCE OF THE PILOT IN THE ECOSYSTEM (based on 6 phases of systematically integrating IC in pilots)

1. Needs and Potentials Identified
- explain why your region selected a certain spearhead in the Smart Up project,
- what potential does it have for your region and who will benefit

Consider the RIE and RIS3 specific needs that you have worked on from different viewpoints in order to identify regional, national and EU/global potential.

2. Strategic Intent Formulated
- i.e. describe the use of SWOT exercise in your region
- analysis of the context in which the actors operate
- understanding of how the context will likely evolve in the future
- list of the chosen competences to be developed internally and externally, i.e. with the help of different networks

Understanding the shared vision and a strategic intent helps the analysis of needed competences.

3. Stakeholders, Users, and Customers Identified
- describe the process of formulating challenges for the innovation camp
- analysis of the main stakeholders and customers
- list other stakeholders that might have some sort of influence
- innovative ways in which different stakeholders can be engaged in the future

Share your understanding of who might support or hinder the realization of the strategic intent.
(closely linked to phase 1 - changes in context may affect behaviours and needs of stakeholders)

4. Designed Activities and Offerings
- describe the innovation camp process and what ideas resulted from it,
- ways to develop the products/services to realize the strategic intent
- ways to modify existing products/services to reach the desired position in the market

Examine how the ideas in the IC and the chosen pilot are/were related.
Evaluate which part of the current offerings can be kept and be relevant for the future
Resulting ideas as to what kinds of new offerings should be developed.

5. Value Network Engaged
- What are the lacking competencies of the actors to be complemented?
- List located partners with these competences. New partners/contacts made in the IC?
- How are these new partners instrumental for the pilots and the strategic intent?
- List which key networks have been established

Specifically, what partnerships can be built with stakeholders that fit these networks.

6. Ecosystem Orchestration Arranged
- Describe how the existing ecosystem has been widened through Smart UP
- How was the widened ecosystem a supporting factor for the pilot?

Consider the mechanisms for a) managing the established network within which the actors operate, b) recognizing critical relationships to be managed, c) sharing benefits as motivation of each partner for the agreed relationship, while single partners may also be part of other networks.

B. INVOLVEMENT AND PARTICIPATION PROCESSES

- Methods that were used to promote, advertise, recruit, create awareness
- Who was targeted specifically, how many were reached (SMEs, citizens in an area, …)
- Did participants/participating organizations apply to join the pilot? Selection procedure?
- Aspects considered for involvement, commitment required and commitment shown,
- Time frame (short/long term?)
- Who participated in the activities (eg. professional roles, type of business, experience)

C. DETAILED PILOT ACTIVITIES

- Encounters and interventions
- Type of activities (participatory, training, testing, transforming, supporting, other)
- Feedback loop (feedback received and possible changes and updated activities)
- Was cross-regional cooperation relevant, was such collaboration achieved
-

D. RESULTS

- Impact for home region
- Impact for BSR region
- Impact beyond the BSR macro region if relevant
-

E. PERSPECTIVES OF OUTCOMES

- Learnings from perspectives of organizers, those who worked for the implementation
- Learnings from perspectives of participants (desired outcomes as expressed by participant/participating organization in the pilot)
- How did cross-regional activities take place? (eg. planned or emerging)
- Surprises
- Disappointments
- Lessons for follow-up implementations

F. SUMMARY AND FUTURE OUTLOOK

- Summary of knowledge gained
- Beneficiaries of the new knowledge
- Follow-up decisions

ANNEX II – Comparative overview

1.   IMPORTANCE OF THE PILOT FOR THE REGION

1.1. Regional Potentials

- explain why your region strategically selected a certain spearhead
- what potential does it have for your region and who will benefit
- consider the Regional Innovation Ecosystem and the Smart Specialisation specific needs which you have worked on in order to identify regional, national and EU/global potential

DENMARK – CITY OF AARHUS/CENTRAL DENMARK REGION: In recent years, several municipalities have worked diligently to explore, test and implement IoT solutions, e.g. by installing sensors in waste bins, setting up IoT networks in municipal buildings, measuring the indoor climate in municipal buildings, or counting cyclists on the local mountain bike routes. The work is often driven forward by technology savvy individuals and supported by informal sparring with other municipalities that have tried similar solutions. The activities can also be initiated at the initiative of local suppliers and consultants, who are very happy to establish test solutions as part of their strategic sales work.

Despite the many initiatives and informal collaborations, work on understanding and implementing new technology for many municipalities continues to be difficult to push, in a busy everyday life. It takes focus, skills and time to become familiar with radically new concepts and fields such as sensor technologies, data transmission, machine learning, drones and data visualization. This can be difficult to find to the desired or necessary extent and in a daily life characterized by a focus on more traditional digitization and operational issues – even despite the great potential that radical innovation holds down the road. Even larger municipalities have doubts about which direction to go, what technologies to focus on, where to buy the right equipment, how data is best processed and presented, and which technology providers are the right ones to collaborate with. The experience across public authorities is such that there is still a great task - political as well as practical - in describing potentials, allocating resources and coming from pilot project to large scale solutions.

For several years, the use of technology by public authorities has been articulated under the concept of Smart City. A recent analysis of the Danish market for Smart City by Damvad Analytics on behalf of Smart City Cluster Denmark, reveals that there are currently 18,000 FTE working in Smart City related jobs in Denmark and revenue in Denmark is already estimated today to be $ 32 billion. If Denmark further embraces global growth in the Smart City area of 12-17 percent per year, it could lead to up to 53,000 jobs in 2025. That's 35,200 additional employees in the field in just six years.

The analysis also highlights the need for more competencies, standards and focused collaboration if we are to lift the public authorities' ability to exploit new technology to a new level where these growth potentials can be met. Investing in and developing new smart solutions is crucial for the public sector to meet the citizens' expectation of ever smarter and better public services within the given economic framework.

In other words, there is a strong need to build up knowledge and skills internally in the public sector, so that the public sector can push the development in a desirable direction and achieve the desired benefits. Much is already underway, and many initiatives are supported by existing collaborations, as well as by Smart City and Open Data initiatives in national digitization strategies - but, as the Damvad analysis points out, even more coherence is needed as well as community thinking and common direction.

ESTONIA – CITY OF TALLINN: For the Smart-up BSR project Tallinn City has chosen smart city as the spearhead topic for its pilot. The reason for this was to build on top of already existing competencies in ICT. Also, Tallinn City is interested to be a smart city hub in terms of RDI, practical use of new solutions and attracting companies in this field. As part of its pilot, Tallinn City together with the Baltic Innovation Agency (BIA) has developed a smart city project assessment tool which the city plans to use starting from this summer.

Tallinn City is currently involved in a large number of different projects either as a regular project partner or less so as the lead partner. The system is based on bottom-up logic. Usually it is the individual departments or other city-affiliated organisations that start or get involved in different projects by getting an invitation from a lead partner. After that the department has to show to the city's strategy unit that the project helps to fulfil the city's development plan. If strategy unit gives it accept, the department has to defend the project before the City Council. Usually most of the project ideas get the accept from both the strategy unit and the City Council.

There are several reasons why Tallinn Enterprise Department wanted to change project development processes in the city. The awareness about new project initiatives has been low in different departments of the city government. Although all

projects are in a project database, this does not ensure that different departments and decisionmakers know what is happening. This led to a situation with two problems. First, different departments were sometimes involved in similar but separate projects. Second, when entering and developing new projects, the departments did not analyse how the project could impact the activities of another department.

In addition, as most of the project ideas manage to get through the strategy unit and get accepted in the City Council, there is a question of how thorough the strategy unit is as a filter. If projects are only loosely related to the actual goals of the city's development plan, then we can expect inefficient use of human and financial resources which would be needed for more important activities. Tallinn City Government envisions that by renewing its project development processes the city can:

- better evaluate each project's economic impact and link with the city's priorities;
- use financial and human resources more efficiently and effectively;
- establish a thorough overview of projects and resources in use;
- and make sure that projects are run on the same principles.

FINLAND – HELSINKI-UUSIMAA REGION: The Helsinki-Uusimaa region chose to run to map overall network action. The pilot of Helsinki-Uusimaa aims for more effective coordination of local stakeholders´ efforts hopefully leading to novel and new AHA actions, research, and innovation. Here the target group are the public and private actors involved in developing AHA measures and bringing healthy ageing into practice. The pilot seeks to find common ground on AHA and the digital in health care

With this piloting we aim to find best ways for different stakeholders to strengthen the AHA networks, to learn from each other and to form combinations of skills. The mapping exercise will foster both local and cross border co-operation in the BSR. Regions will benefit of new visions and collaboration possibilities on the AHA.

FINLAND-KYMENLAAKSO REGION: The geographical location and history have been of great importance to the region when selecting a certain spearhead in the Smart-up BSR project. Kymenlaakso is a region located in the South-East of Finland on the coast of the Baltic Sea and on the Gulf of Finland.

Kymenlaakso is one of the most significant forest industry clusters in Europe and an international hub of logistics and logistics related business and knowhow in the Baltic Sea Region. Finland´s largest universal export and trans-shipment port, Port of Hamina-Kotka, is situated in the region as well. Kymenlaakso´s economy has relied and still relies heavily on its operating ports and port related activities (especially logistics). This is essential for the region.

Port-related activities and business have a long tradition in the region, valuable know-how and relationships have been accumulated for decades. Currently, the Kotka-Hamina port areas are being developed very strongly and new substantial investments have been brought out to the public during last few years. Lots of projects are presently going on in the Kotka old port area which further emphasizes and increases the importance of region´s port areas and related development activities to the economic well-being of Kymenlaakso (particularly for the Southern part of the region i.e. Kotka-Hamina region).

Kymenlaakso region implemented its Smart Specialisation strategy process during 2015-2017. At the end of the process three spearheads were chosen for region´s research and innovation strategy for Smart Specialisation (RIS3) for 2016-2020:

- logistics (safety and intelligent logistics)
- bioeconomy (new products and business from resource-efficient and low-carbon bio- and circular economy)
- digitalization (cyber security and gamification and digital applications in logistics and bioeconomy as well as in tourism and health and well-being).

city and smart port were envisaged as the most suitable spearheads for Kymenlaakso's pilot project. Themes of sustainability and circular economy have begun to gain prominence in the last couple of years. A strong growing trend is that port areas attract investments in bioeconomy and renewable energy. This shows that all today´s developments and investments must have an ecological aspect to consider in some way and the Kotka port areas are putting this into practice.

LATVIA – MINISTRY OF EDUCATION AND SCIENCE (MOES): As the MoES role is to foster innovative, wealthy and integrated society in which everyone has equal opportunities for development, our goal with this pilot was to make sure that RIS3 Strategy was implemented successfully, support partners, and establish necessary amendments to existing RIS3 strategy and implementation plan by doing accurate monitoring. We were committed to facilitating dialogue with the stakeholders by sharing information and providing extensive explanation of the relevant policies, participating in all stages of decision making.

The Smart-up BSR pilot allowed us to expand the existing network with regional level stakeholders, but also to engage and support other Smart-up BSR partners from Latvia, for example we helped the University of Latvia and the University of Liepaja in linking their pilot projects to the RIS3 national framework. Thus we paid more attention to directions like Smart Cities (advanced IT) and circular economy (knowledge intensive bioeconomy).

LITHUANIA – KLAIPEDA SCIENCE AND TECHNOLOGY PARK & AGENCY FOR SCIENCE, INNOVATION AND TECHNOLOGY (MITA): In 2014 Government of the Republic of Lithuania approved Smart Specialization strategic programme in which Lithuania, like other European Union countries, has set its R&D&I priorities, considering existing or potential competitive advantage. Priority directions for R&D&I were determined by analysing the potential of business and research in Lithuania, including the human capital.

Klaipeda region has no separate RIS3 and it is a part of Lithuanian national RIS3, thus the region needs to ensure that its interests are reflected in the national strategy, which provides a framework document for governmental investments. It was important to find the way how the engagement of maritime value chain (policy makers scientists and investors of the region), could help to shape Lithuanian' RIS 3 to reach the consensus on the industry transformation priorities, channel the resources for strategy implementation. In addition, the maritime industry is diversified, so in order to lobby regional priorities the local policy makers must reach a consensus about the regional priorities as well.

In the Initial S3 strategy transport sector and marine sector were not included as separate priority and, taking into consideration the importance and potential of the sector to Lithuania and Klaipeda in particular, Smart up BSR project partners (Klaipeda Science and technology park (KSTP) and Agency for Science, Innovation and Technology (MITA), decided to proceed with development of initiatives that might contribute to the development and visibility of this sector with the help of Smart up BSR project pilot activities.

Smart Up BSR partners in Lithuania – KSTP and MITA, compiled a list of stakeholders that could be relevant in the process of RIS3 planning and implementation. There were organized meetings with politicians, business and academy representatives and prepared SWOT analysis of Lithuania and Klaipėda region. It was agreed that the main strengths of the region concentrate on strategic location of Lithuania, well developed transport and logistic networks as well as Klaipeda Sea Port. Nevertheless, these strengths and potential that might be brought to the region, were not prioritized in the strategic documents. During the meetings stakeholders agreed to propose an additional priority, that in the updated version of the Programme on the Implementation of the Priority Areas of Research and (Socio-Cultural) Development and Innovation (Smart Specialization) and their Priorities would concentrate on "Smart, Green and Integrated Transport".

1.2. Strategic Intent

- the use of SWOT exercise in your region
- an analysis of the context in which the actors operate
- the understanding of how the context will likely evolve in your region in the future
- the chosen competences to be developed internally and externally, i.e. with the help of different networks
- the understanding of the shared vision and the strategic intent for the analysis of needed competences.

DENMARK – CITY OF AARHUS/CENTRAL DENMARK REGION: The Danish Business Promotion Board has identified a number of driving forces to further strengthen the region – entrepreneurship, green growth and circular economy, innovation, digitization and internationalization – along with a number of key specialization areas/industries that will play a key role in the Central Denmark Region going forward. These include areas such as foods, energy and environmental technologies, digital technologies, business tourism and innovation within health, IT and creative professions.

The purpose of GovTech Central Denmark will be to create a strong link between the public authorities in the region and the businesses by:

- Supporting the public authorities in the region to further push forward the area of public digitalization that is about understanding and leveraging radically new technology
- Serving as a working community and platform for upskilling employees in understanding and working with development, procurement, implementation and use of e.g. IoT technology, drones, robots, artificial intelligence and similar technologies through on-site and virtual project participation
- Stimulating the local business community and seize the opportunity for growth in the area
- Creating a position of strength in the Central Denmark region in the Smart City and GovTech areas, based on both the municipalities' and the Region's needs
- Developing concrete solutions for use in the municipalities and in Central Denmark Region
- Establishing and coordinate the collection and sharing of knowledge, know-how and best practices in the field across actors in the region
- Establish new forms of collaboration with the education sector and in this way support as well as utilize the innovation capacity of the educational institutions in the region, e.g. by having ongoing collaborations with various fields of study, where the municipal challenges and the Central Denmark Region's challenges are brought to the attention of students who through projects create innovative concepts or solutions based on the latest research and knowledge of technology etc.
- Creating a joint organization that can both absorb and influence the national and European agendas in the field, including forming a strong and competent interface against Danish government agencies such as KL, DIGST, ERST, EU, OASC and others. on e.g. data standardization and fair AI
- Developing and driving a shared strategy in this area

ESTONIA – CITY OF TALLINN: Tallinn Enterprise Department organised the SWOT workshop in November 20, 2018. The facilitator of the workshop was consultant Mart Repnau who previously has also worked in Tallinn Enterprise Department. The SWOT workshop was based on scenarios developed by Helsinki-Uusimaa Regional Council.

Strong ICT sector, lively start-up scene, competitive tradable services, and trustworthy internet and web environment were identified by the participants as the main strengths of Tallinn and the surrounding region. In the context of climate change, it was found that the location of Tallinn can alleviate the negative effects of climate change and undesired migration problems. It was also noted that the region can be self-sufficient during the crisis.

Weaknesses related to the size, scale and structure (population, economy, resources), and limited attraction of talent were identified in the context of growth & globalisation. Protectionism and segregation/polarisation can harm Tallinn in two ways. First, the city functions as the country's international gateway. Second, Tallinn is smaller in comparison to other cities in the region.

It was identified that alignment with Scandinavian countries is the biggest precondition for favourable business opportunities (Scandinavia as the home market, joint sales and promotion abroad). Pan-regional development can be facilitated through meso-level strategies, e.g Baltic Sea Region Strategy. Trade barriers can create opportunities in the context of lesser competition from Asia. Liberal migration can provide access to talent beyond the EU, mainly Ukraine and Belarus.

The biggest threats to the region and Estonia as a whole were seen in the context of disintegration & fragmentation scenario (EU, NATO, eurozone) as the resulting risks of currency vulnerability or national security (Russia). Another aspect identified in the context of polarisation and segregation is the small size of the country and region together with two separated language groups in Tallinn City Region. Another threat identified was change in domestic policy as a response to the external developments if the new policy will focus on contraction and enclosure.

The SWOT analysis supported to include some of the topics and issues into the new Tallinn Development plan for 2021+ such as the issues with segregation in Tallinn City and attracting international talent.

FINLAND – HELSINKI-UUSIMAA REGION: A SWOT-analysis of the Region´s capabilities was drawn in the early stages of the Smart-up BSR project. The aim of the analysis was to find strengths and opportunities as well as weaknesses and threats

for Helsinki-Uusimaa in the future. The analysis was made to give background for preparation of our new smart specialisation strategy. One of the findings was that we have the elements for strong RDI ecosystem, but we still need to boost the cooperation between actors and enhance the sharing of information. This piloting of mapping the information of actors on a specific field and sharing the information to be used by the actors in the ecosystem is one answer to this need.

FINLAND – KYMENLAAKSO REGION: the Kymenlaakso region´s Smart Specialisation strategy related SWOT synthesis exercise was started in January 2018. All relevant innovation actors/ stakeholders were invited to take part in a workshop. The goal was to deploy the Smart Specialisation strategy process to forecast and better understand the region´s future development via scenarios and SWOT analysis. The scenarios were essential tools in mapping the possibilities and risks of regions´s alternative futures. Cursor Oy gathered relevant innovation actors from Kymenlaakso region (Regional Council of Kymenlaakso, Kouvola Innovation Ltd., South-Eastern Finland University of Applied Sciences and leaders of thematic Smart Specialisation working groups (logistics, bioeconomy and digitalization) to contribute and participate in a SWOT workshop which took place on 4th June 2019. In the workshop participants analysed in an open and interactive co-operation the region´s strengths and weaknesses as well as opportunities for further development and threats to positive development in Kymenlaakso region in relation to 5 different predetermined scenarios[17].

The results were processed further and compiled into one SWOT synthesis by collecting strengths, weaknesses, opportunities and threaths into one template. Characteristic for Kymenlaakso region were e.g. forests and bioeconomy-based products (=S), structural change region and unfavourable population structure (=W), expertise in utilizing digitalisation and tourism (=O), weak/low competence base and outmigration to growth centers (=T).

KYMENLAAKSO REGION´S SWOT SYNTHESIS
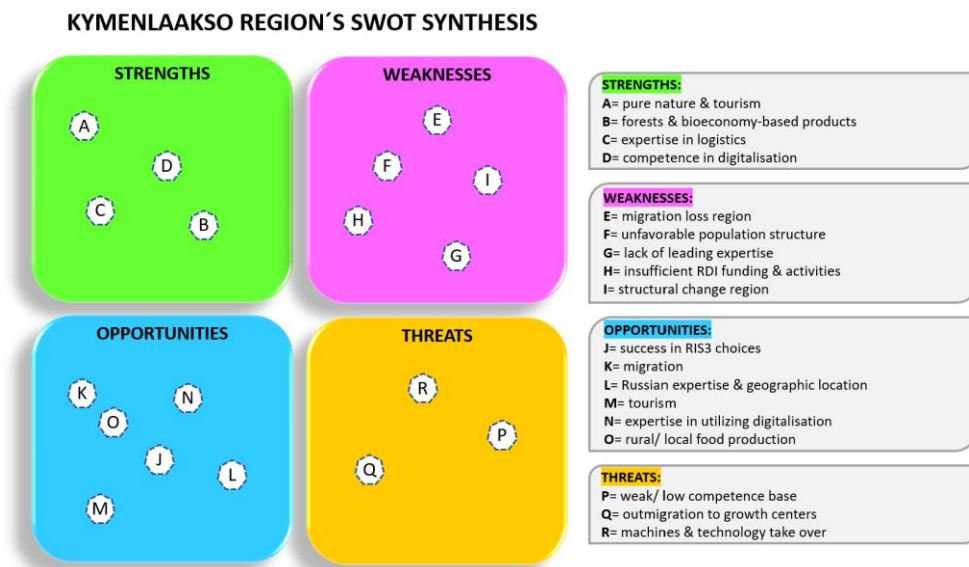
From Cursor Oy´s and region´s point of view this exercise boosted the use of RIS3 strategy in a concrete way. The workshop gave an excellent opportunity to train predicting future scenarios, pinpoint specific development needs, develop strategic foresight thinking and intensify co-operation and interaction with region´s different innovation actors. This exercise showed regional strengths and opportunities and most importantly weaknesses and threats which need specific attention and building of new competence and collaboration. With this exercise it was possible to analyse what kind of competences should be fostered and developed internally and externally in order to manage in the future.

The SWOT workshop and its findings was a good starting point and a boost for Kymenlaakso region to revisit its RIS3 strategy, review critically the validity of the strategy and assess the need of updating the RIS3 strategy (possible strategical change demands; needs to develop region´s innovation ecosystem) since Kymenlaakso region´s RIS3 strategy was compiled and documented already in early 2016. A concrete result was a meeting betwee Cursor Oy and the Regional Council of

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[17] The 5 different scenarios (1: Protectionism and traditional government power, 2: Polarized individualism and expert power, 3: Reliance on local communities, 4: Global and networked tech-imperialism and 5: Growth and EU-driven international co-operation) were based on the SWOT synthesis work done by all Smart-Up BSR project partners at the Aarhus Innovation camp on 18th-21st March. These different scenarios describe alternative future developments in the operation environments by 2050.

Kymenlaakso where preliminary steps were discussed and planned on how to proceed with the process of updating region´s RIS3 strategy: who to involve and how to ensure that relevant input from specific innovation actors will be received. It was decided that during spring 2019 all three RIS3 expert working groups will be gathered together to a joint meeting to e.g. share views and experiences from past operations and activities. The meeting took place in November 6th 2019 and the 19 invitees consisted of a varied group of representatives from Cursor Oy (six), South-Eastern Finland University of Applied Sciences (six), Kouvola Innovation Ltd. (=region´s other development company in the north; two), Kotka Maritime Research Center (one) and company representatives (two) plus representatives from Regional Council of Kymenlaakso (two). It was envisioned that this would also be a starting meeting for the updating process of Kymenlaakso region´s RIS3 which was expected to start in November and last approximately six months until summer 2020. This updating process was planned to be a joint effort engaging region´s all relevant innovation actors including Cursor Oy as well. The process coordinator and orchestrator is the Regional Council of Kymenlaakso.

LATVIA – MINISTRY OF EDUCATION AND SCIENCE (MOES): Latvia is progressing towards globally connected R&I system. Comparing to other EU countries, Latvia still have weak excellence track, with exceptions of some excellence islands. Still relatively weak links with industry. R&D systems are still passive and re-active in steering socio-economic impact. Therefore, the decision to engage with this pilot was to learn from others and work on new approaches where possible.

Latvia envisioned economical but also social impact and outcomes from the project that would support implementation of the RIS3 national framework, for instance, better solutions for skills gap or better management of water resources or improved education and link between the university and the business community by sharing and interdisciplinary circular economy approach.

LITHUANIA – KLAIPEDA SCIENCE AND TECHNOLOGY PARK & AGENCY FOR SCIENCE, INNOVATION AND TECHNOLOGY (MITA): By implementing project Smart Up BSR activities partners from Lithuania agreed to concentrate efforts to include the priority of transport to the Smart Specialization Programme and implement a Pilot in Smart City theme "Smart Port" as a case to show how much potential there is in this sector, how many goals can Lithuania achieve by investing and developing smart transport sector. Regional stakeholders have a potential to become "challenge owners", they have deep knowledge about the context and complexity of the challenge and take a lead towards finding the solutions. This is why it was very useful to have a discussion together with Klaipėda sea Port authority, representatives from Klaipėda municipality and Klaipėda region municipalities about Klaipėda region and Lithuania's strengths, possibilities, weaknesses and threats. This analysis let Klaipeda region to gain better understanding on how the region positions itself among other BSR countries and to prepare certain challenges, case studies, that needed international experience and best practices that could be provided by using Smart up BSR project network.

Discussions, organized during 2018 - 2019 were focusing around many different notions, such as autonomous ships, fully automated ports, digitized shipping information and documentation, automatic monitoring of vessels and equipment, etc., led to identification of the main questions for Smart up BSR mini Innovation camp in Lithuania, Palanga: How can a smart city connect and support a smart region?

1.3. Supporting value network
- the process of formulating challenges for the innovation camp
- an analysis of the main stakeholders, other stakeholders with influence, and customers
- innovative ways in which different stakeholders can be engaged in the future
- an understanding of who might support or hinder the realization of the strategic intent (eg. changes in context may affect behaviours and needs of stakeholders)
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DENMARK – CITY OF AARHUS/CENTRAL DENMARK REGION: Aarhus is the second largest city in Denmark and is one of the most advanced cities in innovation, technology and smart city solutions. As the largest city and municipality in the Region of Central Denmark, Aarhus spearheads the development of smart cities in the Region. However, the many of the remaining municipalities in Central Denmark are not as advanced in terms of innovation and technology and the smart city-agenda is difficult for many of the smaller municipalities and cities. It requires resources, knowledge and expertise, which many of the smaller municipalities simply do not have. Even for a large city like Aarhus, it can be difficult to work with new technologies on a scale that really matter. Therefore, the municipalities have decided to band together and find common solutions to common problems.

Aarhus Municipality has taken the lead in the initiative and GovTech Central Denmark will physically be placed in Aarhus, more specifically, in Aarhus ITK – a division in Aarhus Municipality working with innovation and technology. Aarhus ITK has extensive experience in developing and managing innovation projects and spearheads Aarhus Municipality's exploration of emerging technologies. Examples of this include using virtual reality to counter social anxiety when taking the bus or going to the dentist; using crowd sensing and citizen science to map and combat air quality issues; utilizing drones to detect oil spills and robots to clean up the oil; setting up thermal cameras to quickly and accurately detect if someone falls into the river in the city centre; and much more. Aarhus ITK participates in several European projects and already leads several

cross-municipal initiatives and networks, such as Open Data Denmark, which coordinates public institution's promotion of open data, and OS2, an open source and digitalization network consisting of 69 Danish municipalities.

Evidently, cross-border cooperation is integral to Aarhus ITK and is an important priority. It is based on the idea that we are stronger together; that progress should be shared, and smart and innovative solutions should be made available to all. That is why open source and open data is such an important part of Aarhus ITK's work. This is also the main idea that the pilot is meant to promote further. GovTech Central Denmark is an attempt to do more together and find common solutions to common problems.

The main stakeholders in our pilot are municipalities. GovTech Central Denmark will provide a platform and organisation where public institutions can pool resources, knowledge and experience to explore technologies that would be unattainable for the individual municipalities. It also allows us to test scalable solutions, which can more easily be implemented across municipalities and across borders. Furthermore, GovTech Central Denmark will give the municipalities a more cohesive and much stronger purchasing power, which allows the municipalities to make more specific demands to suppliers instead of solely relying on "stock solutions". Finally, GovTech Central Denmark will position the Region of Central Denmark nationally as well as internationally as a Smart City powerhouse and frontrunner.

The GovTech Central Denmark consortium currently consist of 19 municipalities, the Central Denmark Region and the two business organizations Business Region Aarhus and Business Region MidtVest. As we get further in the development of the GovTech centre, we will increasingly include a wider range of stakeholders, i.e. SMVs, suppliers, larger tech companies, business organizations, universities and knowledge institutions, etc.

FINLAND – HELSINKI-UUSIMAA: The pilot of active healthy ageing was jointly discussed in the Tallinn camp. There was some interest towards it, but the partners had more urgent needs in other piloting themes. The exercise of mapping AHA-actors was still important for Helsinki-Uusimaa and we decided to pilot the work and share both the learnings and information among all the partners. Active and healthy ageing was not a topic nor a challenge in the innovation camps.

FINLAND – KYMENLAAKSO REGION: the main stakeholders/ local actors of the local place-based innovation ecosystem are:

- Universities & research institutes: South-Eastern Finland University of Applied Sciences (Xamk), Kotka Maritime Research Centre
- Relevant companies (spearhead): Port of HaminaKotka, Empower Oy (regional forerunner in smart factory development), Finnhub Association (a national logistics company network).
- Public organizations, Regional Council of Kymenlaakso, the city of Kotka, Cursor Oy, Kouvola Innovation Ltd, Kymenlaakso Chamber of Commerce, entrepreneur organizations
- Civil society organizations (representing citizens/consumers): Kotka Youth Council.

South Kymenlaakso Vocational College and Kouvola Region Vocational College are also actively developing regional ecosystem especially via regional, national and international collaboration projects.

Planning of Finnish Innovation Camp including challenge formulation started in early 2019. Helsinki-Espoo-Kotka Innovation Camp on Sustainable Baltic Sea Region 2030 took place on 2nd-4th May 2019 in Otaniemi (Espoo) and in the City of Kotka. The camp was organized by Aalto University in cooperation with Cursor Oy.

The process of formulating challenge for the Kotka leg of the innovation camp was a special case which initially began because of Smart-up BSR project and Aalto University´s collaboration with University of Helsinki. One goal of the collaboration was to better include the topic of sustainable smart port to the project. In connection to Smart-up BSR piloting and Finnish Innovation Camp, the Kymenlaakso region´s associated partner the city of Kotka/port of Kotka was given the opportunity to provide a real-life challenge for this collaboration where University of Helsinki´s students worked on different real-life problems/ themes of interest from the collaborator partners.

At first Cursor Oy had internal talks about possible camp challenge. After that external talks were held with the representatives of the city of Kotka. Finally, the real-life challenge from the city of Kotka representatives called "How to combine digitalization, sea and people into sustainable business opportunities in the developing Kotka Old Port area?" was delivered forward to student group to be worked on. The work continued during March 2019 with joint events with student groups and challenge owners/ partners. The final output of this collaboration was connected to Finnish Innovation Camp during Kotka leg of the innovation camp when the results of port related challenge was presented in Kotka to challenge owners/ the representatives of the City of Kotka and other camp participants. It was then envisaged that in the best case output of this work could provide our region´s innovation stakeholders new insights and ideas how to develop and orchestrate innovative activities in Kotka Old Port ecosystem.

When thinking of the regional ecosystem´s role in supporting innovations, a certain thing stands out strongly. Kymenlaakso region is geographically a relatively small area and all the relevant innovation actors know each other quite well. The communication and contacting between actors are smooth, fast and straightforward.

A joint working group of all actors has been set up in the region by Regional Council of Kymenlaakso to work on updating the RIS3 strategy. In the context of this, all the existing innovation services and resources as well as possibly lacking ones will be identified and described. This working group serves also as a joint platform for intensified cooperation on selected strategic spearheads/ areas (e.g. establishment of joint innovative projects).

In Kymenlaakso region one mechanism for engaging different stakeholders in the future is via RIS3 expert working groups work (one group dedicated to certain strategic RIS3 spearhead). These groups were set up in late 2016 simultaneously with the finalisation of RIS3 strategy process. The chairmanship and composition of the groups have changed several times after the initiation. This can be seen as a reflection of changes in the surrounding environment and a way to adapt to ecosystem´s changing needs.

LATVIA – MINISTRY OF EDUCATION AND SCIENCE (MOES): The Triple Helix approach was tested and the main target groups were R&D institutions, higher education institutions, entrepreneurs, municipalities and other ministries.

LITHUANIA – KLAIPEDA SCIENCE AND TECHNOLOGY PARK & AGENCY FOR SCIENCE, INNOVATION AND TECHNOLOGY (MITA): In the approach to the Smart Cities mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions. The challenge in the digitalization and automation of the Maritime industry is hidden in the scale. At the time EU is still leading the Maritime development globally, the challenge for regions like Klaipeda is to find the way to benefit on being frontrunners in the application of the technologies, gaining enough knowledge and capacity to transform local Maritime industries to a higher added value products and services. Knowing that digitization and automation, that is crucial part in the development of maritime technologies, have recently become a hot topic among companies and organizations in the global maritime supply chain, it was also important to have support/legacy from different stakeholders who were involved in discussions. Active involvement of Klaipeda Port authority in the process was very important and promising, as this organization also is taking ownership of the challenge and seeks for the solutions. Companies, related to Port industries, have to grow from port cargo handling companies to innovative equipment producer, shipyards stepping into the autonomous shipping technology suppliers, etc.

Klaipeda region brought forward the regional challenge to become a competitive and sustainable port – an important part of Lithuanian national economy:

- •How to flexibly transform local maritime industries in tune with global digitization and automation trends?
- •How to find its own niche and competitive advantage?
- •How to reach stakeholder consensus locally and lobby on a national level?

1.4. Designed Activities and Offerings
- the innovation camp process and what ideas resulted from it,
- ways to develop the products/services to realize the strategic intent
- ways to modify existing products/services to reach the desired position in the market
- ways how the ideas in the IC and the chosen pilot were related
- ways to keep current offerings relevant for the future
- resulting ideas as to what kinds of new offerings should be developed

DENMARK – CITY OF AARHUS/CENTRAL DENMARK REGION: GovTech Central Denmark is an attempt to get more done with the same resources, but it is also about establishing a much more vibrant innovation ecosystem. For the public authorities, GovTech Central Denmark will be a platform for cooperation, competence development and knowledge sharing. It will allow municipalities to develop and implement solutions, which would be unattainable on their own. For companies and suppliers, it creates a much larger and more cohesive market where suppliers have a single-entry point to contact and sell products to all the public authorities. For the region, GovTech Central Denmark is a way of positioning and strengthening the Region of Central Denmark as an innovation cluster nationally and internationally.

Alongside the establishment of GovTech Central Denmark, Aarhus is developing several complementary projects, which have significant overlaps. One of these projects is Aarhus City Lab, which is Aarhus Municipality's digital playground for innovative smart city solutions and a platform for having dialogues with citizens about the role of technology in our society. Aarhus City Lab is a place where the municipality can cooperate with local actors who are interested in developing and testing new technologies, i.e. Aarhus University, SMVs, tech companies and suppliers, entrepreneurs, students and citizens. Aarhus City Lab is a living lab, which means that it provides a venue where experiments can be setup in a realistic use-context and that the end-user is an active participant throughout the process.

Aarhus City Lab acts as a single point of entry into the municipality for external partners: facilitation and coordination are key aspects of Aarhus City Lab to ensure that the right people are matched. Furthermore, Aarhus City Lab acts as a forum for dialogue between citizens and the municipality. Aarhus City Lab is placed pier at the very heart of the city and is a very well-visited area during the summer months. Therefore, it offers great opportunities for the municipality to meet and engage with citizens. Aarhus City Lab will regularly host presentations, prototyping, host Open Lab every Friday and have a mobile office during the summer months.

ESTONIA – CITY OF TALLINN: Tallinn City Enterprise Department organized Tallinn Innovation Camp which was held in September 17-19. The venue of the camp was Innovation and Business Centre Mektory. The first day of the camp began with several presentations:

Kristjan Lepik (product manager, Topia) - "Where will people go?";
Hannu Tuomisaari (Senior Adviser, the City of Espoo) - "Espoo - the city of sustainable growth";
Dr. Anne Stenros (CEO, Senior Consultant, GrowthPro; former Chief Design Officer for the City of Helsinki and KONE Corporation) - "Future City - Open City - Towards people-oriented urbanism";
Toomas Haidak (Head of Strategy Unit, Tallinn City) - "Tallinn - the city where the future is now".

The idea behind the presentations was to provide an introduction into the challenges. The camp had ca 100 participants who were divided between 7 teams that solved 3 different challenges:

1) Challenge 1: How to smarten up the region?
2) Challenge 2: How to increase citizen participation and promote co-creation to improve living environment and quality of life?
3) Challenge 3: How to make the city digital with the help of artificial intelligence and co-creation?

Amongst the participants were representatives and experts from other partner organisations of the project, city officials and master's students. During the camp the 1st Vice-President of Committee of the Regions, Mr. Markku Markkula also delivered a speech titled "Digitalisation Progress and Challenges in Europe. During the last day of the camp, Professor Marianne Huang from Aarhus University delivered a presentation about co-creation and what has been done in the City of Aarhus.

The challenges were very strongly focussed on how to improve urban space and utilize digital solutions in the city. Several interesting solutions were pitched by the participants. One of the ideas under Challenge 1 was an app which by using gamification features would provide users a possibility to map out areas that need improvements (e.g large piles of trash, infrastructure that needs repairs etc). The second idea under Challenge 1 was a collaboration platform targeted towards apartment unions. Two ideas were pitched under Challenge 2 which focussed on revitalizing old ABC centres and closing the gap between the city government and local communities by hiring community managers in large apartment block areas. Challenge 3 focussed on AI under which two ideas were pitched. First, an AI solution which would manage the traffic flow. Second, an AI-based reporting tool for citizens.

Although the idea of the Tallinn pilot did not emerge from the innovation camp as the need for changes in the project development surfaced later, several ideas developed during the camp have moved forward. For example, the use of AI in traffic management was an idea under discussion in Tallinn City already before the innovation camp, the event and the pitched idea gave an additional push to move forward with it. At the moment, Tallinn City is one of the six partner cities (other cities include Amsterdam, Helsinki, Paris Region, Copenhagen and Stavanger) in AI4Cities project where the idea is to use pre-commercial procurement process to procure AI solutions in the fields of energy and mobility to move towards carbon neutrality. Although the exact procurement projects are not yet decided, the City of Tallinn has shown interest to use the project to procure an AI solution for traffic management.

Tallinn City is also a partner in the project CENTRINNO. One of the initial reasons why Tallinn joined the project was the potential to test out the idea of having community managers. However, as the project is only starting, the exact activities have not been decided in detail yet.

FINLAND – KYMENLAAKSO REGION: As first steps relating to pilot action planning Aalto University gave guidelines on how to map the key stakeholders and projects in regions relating to four spearheads. Cursor Oy did this exercise of mapping regional stakeholders and scanning for relevant existing regional initiatives and projects which could be taken up as best practices or to be linked to piloting and experimentation for Smart-up BSR three times. The latter mapping exercise was done as a homework for Tallinn Innovation Camp which was held on 16th-19th September 2019. From Kymenlaakso´s perspective the most promising priority topic for the pilots was Smart City.

The Tallinn Innovation camp focused on the methodology of pilot planning and planning of pilots. During the camp Aalto team organized a discussion with partners concerning the methodology for pilot planning.Partners, including Cursor Oy, presented their first steps for pilot planning (stakeholder mapping and scanning for relevant projects and initiatives). Discussions also addressed i.a. the style of the guidelines for designing the methodology. As a result, it was agreed to compile a concise guideline for pilot planning methodology.

Aalto team compiled a 2-page document with methodological guidelines for pilot planning and all partners were given the opportunity to comment it. Planning of pilots continued after Tallinn camp and each partner was requested to deliver a preliminary Pilot Action Plan and main outputs. For Cursor and Kymenlaakso region possible pilots could address the development of Kotka port area and/or "e-Kotka" (development of digital services/ solutions for people). These two were chosen because they were already existing regional initiatives which can be connected to cross-regional/EU level projects for building up synergies and increasing impact.

Finally, from Kymenlaakso´s perspective a broader theme of Smart City/ smart port was seen as the most promising priority topic for piloting

Lessons learnt from previous innovation camps especially held in Aarhus/ Denmark, Klaipeda/ Lithuania and Gdansk/ Poland have been inspiring and useful in visualizing and picturing what kind of structures, operations and activities could be included in port area-related development processes in Kotka-Hamina region and what could be exploited for Kotka leg of Finnish innovation camp challenge creation as well.

In Kymenlaakso, in the city of Kotka, a Kotka Old Port area regeneration project is a huge ongoing effort which takes a lot of time, resources and substantial investments. The overarching vision is to transform a brownfield area situated on the seaside and in the city centre to a mixed-use area in a sustainable manner. The whole area will be built and converted into a modern centre where business, university of applied sciences, development company, citizens, authorities etc. EDP actors are brought together to interact with each other. The aim is to create a vibrant innovation ecosystem which engages different stakeholder groups to cooperate, boosts start-up culture and creates competitive edge based on region´s strengths and opportunities that are available regionally and inter-regionally (especially in the Baltic Sea Region).

The aim is that region´s innovation actors will benefit from novel synergies, have access to new networks, opportunities and cooperation which are enabled by favourable surroundings, conditions and processes created by this innovation ecosystem.

The whole regeneration project consists of many different elements and projects. During winter in 2019 one activity relating to this bigger process and to Finnish Innovation Camp challenge formulation and implementation was executed together with Cursor Oy, project´s associated partner the city of Kotka, Aalto University and students of University of Helsinki. Smart-up BSR project was partnering with University of Helsinki to better include the topic of sustainable smart port to the project.

As a part of the Finnish Innovation Camp planning, challenge formulation and work with the challenge for the Kotka leg of the Finnish innovation camp was arranged aberrantly before the actual camp. The city of Kotka/port of Kotka was given the opportunity to provide a real-life challenge for above-mentioned collaboration where University of Helsinki´s students worked on different real-life problems/ themes of interest from the collaborator partners. This work of students was connected to Finnish Innovation Camp when work results for port related challenge was presented in Kotka to challenge owners/ the representatives of the city of Kotka and other camp participants during Kotka leg of the camp.

First Cursor Oy had internal talks about possible challenge and then external talks with the representative of the city of Kotka. Finally, the real-life challenge from the city of Kotka called "How to combine digitalization, sea and people into sustainable business opportunities in the developing Kotka Old Port area?" was formulated and delivered forwards to student group to be worked on. The work continued during March 2019 with joint events with student groups and challenge owners/ partners. The final output of the work was presented during the Kotka leg of the Finnish Innovation Camp on Friday 3rd May 2019.

University of Helsinki´s students´ work Kotka Old Port Project- A Sustainable Hub by the Sea ephasized the improved accessibility of all the good parts in Kotka, the urban national park and the unique features of a city by the sea. The work presented several concrete ideas with which to enrich and enliven the port area with innovative sustainable entrepreneurship. The role of local entrepreneurship was emphasized because it can really shape the port area into a commercial form while giving the locals a chance to support their community and get goods produced nearby. This also supports the tourism business aspect. Sustainability was highlighted in all city planning and development. This could be realized e.g. via adaptive reuse of buildings/ warehouses which could give new purpose/ life to old buildings and provide space for new activities and business. From cultural and excitement point of view new events that get the attention of people and create good memories could be organized (pop-up events such as restaurant days, start-up activities, circular conomy and collaborative consumption related functions).

As far as challenge owners (especially land use planning) were concerned, they were very interested in exploiting the work results in their future work. Unfortunately, there is currently no suitable ongoing project or plan through which to implement the Kotka Old Port Project idea presented by the students. The idea is though well remembered, and it has strong potential to be utilized via temporary use of the Port area. The development of the area is a multi-year process and e.g. the vacant warehouse buildings in the area offer opportunities for many activities.

The agenda of Kotka leg of the innovation camp tackled especially topics relating to port area and its development. In addition to the presentation of students from Helsinki University, Port of HaminaKotka presented their novel Gisgro Port Digital Twin Project demonstrating 3D model of the port areas for maintenance of the underwater and surface structures.

Port of HaminaKotka´s presentation of innovative 3D model was perceived as a possible case that could be utilised for cross-regional pilot planning i.e. introduced and piloted also in other partner regions. Initiatives were made during the rest of the Finnish innovation camp to matchmake interested parties from e.g. Poland and Lithuania with Port of HaminaKotka representatives.

LITHUANIA – KLAIPEDA SCIENCE AND TECHNOLOGY PARK & AGENCY FOR SCIENCE, INNOVATION AND TECHNOLOGY (MITA): The Mini-Camp was held on 13-14 June 2018 started with a visit to Western Baltija Shipyard to get insights on maritime industry development at Klaipeda region.The working group on Klaipeda regional challenge outlined the importance of joining different key actors to promote and work with the maritime industry. This should help to have a critical mass to get the maritime industry on the national smart specialization strategy. The working group developed a roadmap for linking maritime industry to RIS3 priority areas:

1. Finding key players;
2. Preparing pitches for industries connected with maritime;
3. Business cases;
4. Clustering;
5. Changing mindsets: e.g. by shock therapy – what if Lithuania had NO maritime industry?

This developed roadmap, as well as huge experience of participants and experts, who attended in this Innovation camp provided to Lithuanian partners a start to implement pilot activities. After scanning of existing initiatives and ideas, elaborated during Mini Innovation Camp in Palanga, projects that might bring synergy and larger impact as well as identify the steps for achieving bigger impact in the region, it was decided to initiate Smart City – Smart Port pilot project, that would:

- generate ideas and prototypes that could be adapted in developing smart transport ecosystems and in the logistics sector through automation and digitalization of port terminal facilities, safety and various processes;
- increase port efficiency and do impact for port environment regarding SDG;
- promote autonomous port vision by increasing digitalization and automation processes in Klaipeda port and among all port terminals, stakeholders and companies in BSR;
- encourage the creation of teams of innovators, who are interested in the newest technologies, that could be used to ensure the safety of the Ports and might be applied in Naval Forces.

1.5. Ecosystem Orchestration

- Describe how the existing ecosystem has been widened through Smart UP
- How was the widened ecosystem a supporting factor for the pilot?
- This includes considering the mechanisms a) for managing the established network within which the actors operate, b) for recognizing critical relationships to be managed, c) for sharing benefits as motivation of each partner for the agreed relationship, while single partners may also be part of   other networks.
- What are the lacking competencies of the actors to be complemented?
- Are any partners located with these competences? New partners/contacts made in the IC?
- How are these new partners instrumental for the pilots and the strategic intent?
- Which key networks have been established?
- What partnerships can be built with stakeholders that fit these networks?

DENMARK – CITY OF AARHUS/CENTRAL DENMARK REGION: Denmark has a strong tradition of cross-municipal knowledge sharing and collaboration on, amongst other things national IT infrastructure, digitization strategies, common municipal platforms, Open Source, Open Data and different digital and Smart City clusters. Here work is done to ensure common progress, standards, catalogues of inspiration and low-practical templates for the benefit of the community.

The City of Aarhus plays a significant role in several of these existing initiatives and because of the potential rewards of further collaborating on the uptake of emerging technologies, the City of Aarhus has chosen to also spearhead the GovTech Central Denmark initiative by framing the potentials, scoping the collaboration and ensuring buy-in from the 19 municipalities in the region as well as the Region itself.

GovTech Central Denmark is a trans-regional initiative with the purpose of enabling municipalities to explore, test and implement emerging technologies. The centre is an initiative by the 19 municipalities in Central Denmark, the Region of Central Denmark and Business Region Aarhus and Business Region MidtVest. In total, the public authorities represent more than 1.3 million citizens and includes some of the most vibrant innovation hubs, exiting tech clusters and forward-thinking public authorities.

GovTech Central Denmark is the product of the realisation that we are facing the same challenges and that we can get further for the same resources by working together. GovTech Central Denmark is a platform and an organization where public authorities can come together and form more structured partnerships than what has traditionally been done. The centre will have a permanent staff of 6 employees who will manage the day-to-day operation, examine funding opportunities and consult municipalities in the projects. The individual projects, which are developed in GovTech Central Denmark can either be managed in a decentralized manner by the one of the municipalities or directly by one of the permanent staff in the centre. Furthermore, the municipalities have the option to have one of their employees stationed in the GovTech centre for an extended period (a minimum of 6 months). This will allow municipalities to improve the qualifications and experience level of their employees and will allow GovTech Central Denmark to draw on the competencies and expertise of all municipalities in the region.

Projects do not exist in a vacuum, but rather build on other complementary projects in a larger context. There are overlaps between the pilot projects, especially with Aarhus City Lab being a test facility for innovative smart city solutions. Some of the solutions developed in GovTech Central Denmark could easily be tested on a small scale in Aarhus City Lab before scaling the solutions and implementing them at a much larger scale across the region. Aarhus City Lab also has the potential to be scaled further and developed as a regional living lab to complement GovTech Central Denmark. Furthermore, and significantly, the pilot projects' innovation ecosystems are complementary meaning that GovTech Central Denmark draws on the partnerships that has already been established in Aarhus City Lab and vice versa.

ESTONIA – CITY OF TALLINN: Smart-up BSR has definitely helped Tallinn City to establish contacts with different project partners. In addition, the cooperation between the city government and Tallinn University of Technology has also strengthened. The Innovation Camp format has been adopted by the Tallinn Science Park Technopol. It has developed its own innovation programme called Momentum which is offered as a service for companies and public sector organisations to develop new products and services.

More information about Momentum can be found through the following link: https://www.tehnopol.ee/en/momentum/momentum-case/

The implementation of Tallinn pilot is not so much dependent on the wider ecosystem as the focus is on changing the internal processes in the city. However, implementing the pilot can help to build stronger ties with actors in the local ecosystem and in the BSR region through more meaningful projects.

FINLAND – HELSINKI-UUSIMAA REGION: The Smart-up BSR -project has linked us more closely to the partnering regions. Most important has been the knowledge and personal contacts in the field of Smart Specialisation strategies that we have gained. The project has given us a wider understanding of the different ways to prepare and implement a strategy for Smart Specialisation.The local stakeholders who have participated the innovation camps have got important new contacts. Especially the representatives from the Urban Mill could share their experiences of running a local innovation ecosystem and get access to new partnerhips in the BSR-region. There is a great potential for future connections on the active healthy ageing -sector once the piloted mapping of actors will be further developed to be a digital tool. This will come in a later stage though.

FINLAND – KYMENLAAKSO REGION: One noticeable thing is that the city of Kotka has taken even more active role as an enabler in regional ecosystem. The city has been an orchestrator for innovative projects and a co-creator and tester of innovations. Some of the activities have been inspired by Smart-up BSR project. In Kymenlaakso region an excellent example of a city being an enabler is Kotka Old Port regeneration project which was tied up with the planning and execution of Finnish Innovation Camp.

From Kymenlaakso´s perspective a broader theme of Smart City . seen as the most promising priority topic for piloting like it is for the City of Tallinn, City of Aarhus, University of Latvia and ITMO as well. It was envisaged that the Smart City theme is a promising basis for cross-regional pilots which could combine Smart-up partners together. The development of smart ports as a sub-theme is also closely related to Smart City theme. Project´s port cities (Tallinn, Aarhus, Klaipeda, Gdansk, Kotka, Stockholm and Helsinki) are interested in this initiative within the Smart City theme.

From Kymenlaakso´s point of view lacking regional competences could be complemented with collaborating especially with project partners from port cities

LITHUANIA – KLAIPEDA SCIENCE AND TECHNOLOGY PARK & AGENCY FOR SCIENCE, INNOVATION AND TECHNOLOGY (MITA): KSTP and MITA promote business and science cooperation, commercialization of research and aim to stimulate applied research, technological development and innovation in Lithuania. One of the instruments to achieve these goals is organizing various events, that create conditions for and strengthen cooperation between public and private sectors. New solutions in digitalization, automatization, and smart transport ecosystems and safety are very important for all BSR ports. So, Lithuanian partners agreed that Pilot for Smart city – Smart Port will consist of three different events:

1.   LNG forum 2019. This event was organized on 15-16 May, 2019 Klaipėda, Lithuania.

Partners: Lithuanian LNG cluster, KSTP, JSC Klaipėdos Nafta (KN), Embassy of the Kingdom of the Netherlands in Lithuania.

Representatives from Poland, Sweden, Germany, Belgium, Norway, Denmark, the Netherlands and Lithuania.

Goal: to present and share experience about new, innovative technologies and services that are developed in BSR and provide a full overview of the LNG application and perspectives, ranging from LNG road and railway transport to the maritime and inland waterway sector. Sustainable LNG and liquefied biogas (LBG) infrastructure development.

Statistics: 200 participants, 8 countries, 26 speakers.

2.Portathon Baltic 2019. Pilot project of Smart up BSR, that was very successful event, that gathered many parts of smart maritime innovation ecosystem together and contributed to development of concrete solutions, took place on 20-22 September, 2019 Klaipėda, Lithuania.

Partners: Lithuanian LNG cluster, Klaipėda Science and Technology Park (KSTP), Gdansk-Gdynia-Sopot Metropolitan Area, Agency for Science, Innovation and Technology (MITA), Klaipeda State Seaport Authority.

Representatives from Sweden, Germany, Netherlands and Lithuania.

Goal: to generate ideas and prototypes that could be adapted in developing smart transport ecosystems and in the logistics sector through automation and digitalization of port terminal facilities and various processes; to increase port efficiency and do impact for port environment regarding SDG.

Statistics: 80 participants, 4 countries, 12 mentors, 18 teams and solutions.

3. Delta Navy – Military Tech Hackathon. Another Pilot project that concentrates on encouragement of citizens and other stakeholders of local-based ecosystem to take active role in the development of new technologies, related to safety and security, took place on 25-27 October, 2019 Klaipėda, Lithuania.

Partners: Lithuanian Naval Force; MITA, Ministry of National Defense, Enterprise Lithuania, Kaunas University of Technology, Klaipeda University, Vilnius Gediminas Technical University, Baltic Tech Park, Klaipeda Science and Technology Park.

Goal: to generate ideas and prototypes that could be adapted in the Navy; to encourage the development of advanced products that require the highest military requirements; to bring people from different fields for the same purpose - to strengthen the Navy and development of solutions, that might be used for civil purposes of safety and security.

Considering the specific maritime smart city topic, Delta Navy Hackathon was held in a Lithuanian Naval Force headquarters and supply ship "Jotvingis".

Statistics: 50 participants, 26 mentors, 11 teams and solutions.

2. INVOLVEMENT AND PARTICIPATION PROCESSES

- Methods that were used to promote, advertise, recruit, create awareness
- Who was targeted specifically, how many were reached (SMEs, citizens in an area, …)
- Did participants/participating organizations apply to join the pilot? Selection procedure?
- Aspects considered for involvement, commitment required and commitment shown,
- Time frame (short/long term?)
- Who participated in the activities (eg. professional roles, type of business, experience)

DENMARK – CITY OF AARHUS/CENTRAL DENMARK REGION: The public authorities in the Central Jutland region have the opportunity to create a significant position of strength in this area and at the same time scale good and sustainable solutions to the benefit of the community, thereby helping to save resources and solve the challenges facing society today. Some of these solutions will be municipality-specific and are based on the challenges of individual municipalities. Other challenges are transversal and are more pronounced in the regional work, still with a high degree of commonality. This requires more cross-sectoral cooperation, and it is especially on these challenges that the potential of collaborating more formally on the development of common, sustainable and scalable solutions can benefit the entire region and position the region as a European front runner.

The process of establishing GovTech Central Denmark began with forming a strong project group, which would spearhead development of the concept, formulate the vision and intended activities and suggest a governance model and budget. The project group consisted of chief digital officers from three municipalities (Aarhus, Favrskov and Horsens), directors from the two Business Regions and Heads of Offices from the Region of Central Denmark. This project description was then presented to the remaining municipalities at the kickoff meeting. Members of the initial project group included:

- Aarhus Municipality
- Horsens Municipality
- Favrskov Municipality
- The Region of Central Denmark
- Business Region Aarhus
- Business Region MidtVest

Given the shift in responsibility regarding stimulating business and growth away from the regional level to the municipality level, it is imperative that City of Aarhus will embrace this responsibility and opportunity to establish the city as a large-scale testbed for innovative urban solutions that can stimulate growth in the area. Central municipal strategies such as the Climate Plan and the Smart Aarhus strategy will play a key role in forming this. It is only a natural next step to establish a strong, cross-cutting collaboration on emerging technologies and the GovTech area in the Central Denmark Region.

ESTONIA – CITY OF TALLINN: As the pilot is focussing on the city's internal processes, a wider circle of stakeholders was not involved.

Tallinn City has chosen smart city as the spearhead topic in this project. This focus on smart city activities thanks to this topic has helped the city to support and start several different initiatives. One of such initiatives is the chosen pilot which indeed does not include a wide range of stakeholders as it is focussed on the city's internal processes. However, the other initiatives have been more collaborative.

In cooperation with Tallinn Science Park Tehnopol, Tallinn City has launched its own innovation fund called Tallinnovation to find and implement smart city solutions in Tallinn. The fund distributes funding on a competitive basis. The goals of Tallinnovation are:

- to support cooperation between the City of Tallinn and technology companies by enabling the use of innovative software or hardware products in the City of Tallinn;
- to support the City of Tallinn's ambition to make the city environment more modern, sustainable, citizen-friendly, and open;
- to introduce innovative smart city solutions, products, and services to the City of Tallinn;
- to raise the awareness of Tallinn City employees and officials about new possible innovative developments in the urban environment.

More information can be found through the following link: https://innovatsioonifond.tehnopol.ee/en/#goal

Tallinn City has financially supported the establishment of smart city professorship in the School of Engineering at Tallinn University of Technology. A number of other stakeholders have been involved with the establishment of smart city professorship such as Ericsson, AS Mainor and different private companies located in Ülemiste. Together with Technopolis, AS Mainor is the major developer of Ülemiste area. The company supported the establishment of the professorship with 500 000€. In addition to research in smart city area which by nature is interdisciplinary, the aim of the professorship is to support the collaboration between Tallinn University of Technology, Tallinn City, private companies involved in the development of smart city solutions and real estate developers in Ülemiste.

FINLAND – HELSINKI-UUSIMAA REGION: Stakeholders and main actors:

- Social Sector Knowledge Hubs like, KELA (The Social Insurance Institution of Finland), THL (Finnish Institute for Health and Welfare), Health Capital Helsinki; Helsinki Business Hub, Terkko Health Accelerator, Socca (The Centre of Excellence on Social Welfare in the Helsinki Metropolitan Area), Laurea University of Applied Sciences,

- several (sometimes iterative) phone calls to management or AHA -related experts in these organisations with the aim to find specific interest areas and role validation as well as finding leads other actors´ involvement

- For Helsinki-Uusimaa Regional Council; the role is in catalysing and promoting AHA – related initiatives and to facilitate a more coordinated approach; also interest in international funding/projects/policy formation (especially related to RDI)

FINLAND – KYMENLAAKSO REGION: Involvement and participation processes of three potential pilots by the end of autumn 2019:

Gisgro Port Digital Twin Project

- The HaminaKotka Port presented their novel Gisgro Port Digital Twin Project demonstrating 3D model of the port areas for maintenance of the underwater and surface structures during Finnish innovation camp in Kotka 3rd May.
- Representatives of Port of HaminaKotka were contacted during summer 2019 and invited to attend and present their 3D model in Gdansk camp 9th-11th September => nobody was able to participate.
- New port development related operators were contacted during early autumn to attend Gdansk camp.
- Getting new participants from Finnhub association (logistics expertise and innovation network, Ms. Elina Multanen) https://www.finnhub.fi/en/home/ and Empower Oy (smart city/ digital and expert services, Mr. Matti Karhu) https://www.empower.fi/etusivu.html, to participate in Gdansk Camp.
- Facilitating initial contacts with regional representatives with interested Smart-up BSR partners during Gdansk Camp.
- Both company representatives and representatives from the city of Kotka were invited to participate Portathon Baltic 2019 – port technology hackathon taking place in Klaipėda on 20th-22nd September => nobody was able to participate.

Kotka Old Port Project- A Sustainable Hub by the Sea

- The Finnish camp in May included a cooperation project between the city of Kotka and University of Helsinki´s students who were to work on real-life challenges/ questions.
- Kotka´s challenge was "How to combine digitalization, sea and people into sustainable business opportunities in the developing Kotka Old Port area?"
- The output of the work was presented during the Kotka leg of the Innovation Camp in Kotka 3rd May to challenge owners/ the representatives of the city of Kotka and other camp participants.
- Vision for the development of the Kotka Old Port area (some points):
  o Local entrepreneurship => shapes the place into a commercial form => gives the locals a chance to support their community and get goods produced near by => supports also the tourism aspect.
  o Extend the natural look and keep it green => several renowned and awarded parks.
  o Sustainable city planning and development => adaptive reuse of buildings/ warehouses => gives a new purpose to a building and provides space for activities and keeps the history of that place intact, giving it more personality.
- Representatives from the city of Kotka were invited to participate Portathon Baltic 2019 – port technology hackathon taking place in Klaipėda on 20th-22nd September and to Riga camp in February 2020 => nobody was able to participate.

Cross-border network of youth

When the implementation of our original regional piloting ideas did not reach the implementation stage, we contacted Aalto University to participate to a pilot they were coordinating.

- Cross-border network to connect youth in BSR while increasing cross-regional cooperation and increase youth influence on sustainability issues. The pilot idea was presented during Finnish Innovation Camp in Espoo by high school students.
- The core of the initiative was to form a ”sub-official” group of students guided by interested parties (such as teachers).
- Smart-up BSR partners met two of the high school students from Finland during Gdansk innovation camp on 8th September during project Partners´ Meeting. These students promoted the idea of building up a network of youth for sustainability in the BSR.
- During autumn 2019, we had discussions with Aalto University about building and planning the network, possible target groups and action plan for proceeding.
- In late September, more information was received from Aalto University => still more detailed information was needed and awaited from initiating youth before approaching regional parties (e.g. high schools/ teachers) with a concrete and attractive “offering”.
- Simultaneously conversations were held with Cursor colleagues about potential participating high schools => most promising was Kotkan lyseo, a certified educational institution for sustainable development from the region to participate the Baltic Sea Region Area Youth Network.
- Cursor Oy preliminarily promoted this pilot initiative further in Kymenlaakso regio. Partners were asked by Aalto team to get in contact with local schools and youth organizations and promote the pilot idea addressing climate change and sustainability questions.
- In late October 2019 ideas about youth network were still very fragmented to be provided to teachers; a little clearer plan and goal would have been needed in order to proceed regionally.

- In early 2020, we approached the youth council of the city of Kotka. We tried to get them involved in the Innovation Camp held in Riga on February 2020. Unfortunately, the practical arrangements were left so late that the participation of our youth representatives was not successful.
The contact information of the youth council of the city of Kotka has been forwarded to student, who is leading the Youth Network piloting project of Aalto University to assemble the youth network.

- In spring 2020, we have widely disseminated the BSR Youth Survey to local educational institutions, where the target age group of the survey can be found.

LATVIA – MINISTRY OF EDUCATION AND SCIENCE (MOES): The methods that were used to promote, advertise, recruit, create awareness were: Support and discussions with universities, research centers, businesses other public bodies.

We proactively tried to communicate and collaborate with relevant stakeholders, especially stakeholders that were interested and had regional or sector specific knowledge, expertise or experiences helpful for RIS3 national strategy implementation and monitoring. Universities, research centers, businesses, municipalities and other ministries participated in the activities.

LITHUANIA – KLAIPEDA SCIENCE AND TECHNOLOGY PARK & AGENCY FOR SCIENCE, INNOVATION AND TECHNOLOGY (MITA): The Pilot's main task is to analyse the current situation of ports, their challenges, the technologies applied in the port and generate ideas, prototypes, solutions for port digitization and automation processes with the help of target groups. Activities of the Pilot project helped to create network of maritime innovators as well as to develop unique solutions for maritime cities/regions that can be used not only in Ports and companies who operate in port, for universities to establish new pragmas, also Naval Forces and for civil needs.

In order to achieve the right and targeted audience in the events, there was engaged wide network of Smart UP BSR partners. The invitations to the events were also spread through BSR Port authorities and other interested parties. Smart Port pilot received huge interest and pilot organizers managed to gather a wide network of associated partners for each planned pilot event: JSC Klaipėdos Nafta (KN), Embassy of the Kingdom of the Netherlands in Lithuania, Lithuanian LNG cluster, Klaipeda State Seaport Authority, Lithuanian Naval Force, Ministry of National Defence, Enterprise Lithuania, Kaunas University of Technology, Klaipeda University, Vilnius Gediminas Technical University, Baltic Tech Park.

Smart Port pilot events were open for all who were interested in generating new ideas, have a solution on how to solve challenges, looking for new contacts and networks, and etc. Through created registration link there were received registrations from various countries, not only from BSR region – this showed us that our set challenges are important also internationally. The Pilot events attracted participants from Poland, Sweden, Germany, Belgium, Norway, Denmark, Netherlands. There were representatives from Port authorities, Clusters, International companies, startups, new technology providers, students and scientists. We, as Pilot organizers, were happy that we attracted representatives of international companies to participate in this pilot as an experts and as mentors as well.

To implement The Pilot activities Lithuanian partners organized meetings with regional stakeholders, cluster representatives, universities and other projects partners.

Due to the sensitivity of the field of an application, Delta Navy Hackathon organizers had to organize the selection of potential participants. There were organized two steps selection procedure:

1. Registration and selection of applicants, that met set requirements;
2. Selected participants were invited to visit the Naval Force ship "Jotvingis" to form teams, to get acquainted with tasks and be better prepared to accomplish them.

3. DETAILED PILOT ACTIVITIES

-     Encounters and interventions
-     Type of activities (participatory, training, testing, transforming, supporting, other)
-     Feedback loop (feedback received and possible changes and updated activities)
-     Was cross-regional cooperation relevant, was such collaboration achieved

DENMARK – CITY OF AARHUS/CENTRAL DENMARK REGION: GovTech Central Denmark will be a network and an organization, which has the expertise and resources to - on behalf of the network - explore, develop and test technologies in concrete projects and solutions, which the municipalities easily can implement afterwards. GovTech Central Denmark will have four focus areas:

1) **Project development**: maintain a common technology radar; benchmark the market and suppliers; testing technologies and getting hands-on experiences; advice municipalities in choosing and setting up equipment; identify concrete needs, use-cases and business-cases¨

2) **Establish and manage projects**: establish best-practices for public-private partnerships; establish development partnerships in areas where the market is not yet established

3) **Purchase and implementation**: establish best-practices for purchasing and calls for tenders; formulate standards for purchasing IoT-solutions, drones, AI-services, etc.; ensure data ownership and open data; assist in organizational implementation

4) **Dissemination of knowledge and competence development**: be a centre for competence development; develop and distribute IoT-"starter kits"; arrange inspirational workshops and presentations; maintain a catalogue of use-cases and best-practices

GovTech Central Denmark is an attempt to get more done with the same resources, but it is also about establishing a much more vibrant innovation ecosystem. For the public authorities, GovTech Central Denmark will be a platform for cooperation, competence development and knowledge sharing. It will allow municipalities to develop and implement solutions, which would be unattainable on their own. For companies and suppliers, it creates a much larger and more cohesive market where suppliers have a single-entry point to contact and sell products to all the public authorities. For the region, GovTech Central Denmark is a way of positioning and strengthening the Region of Central Denmark as an innovation cluster nationally and internationally.

As a much more concrete part of the pilot, the ITK department in Aarhus Municipality (Aarhus ITK) is also developing an IoT-suitcase, which contains a wide variety of sensors that can be utilized in a range of different Smart City applications. The IoT suitcase is a starter kit, which municipal departments could purchase to start experimenting with IoT solutions or to suit specific needs. A solution like the IoT suitcase will also be made available in GovTech Central Denmark where municipalities can get guidance in getting started using IoT sensors and get consultation on purchasing an IoT-starter kit.

The IoT suitcase containing a basic set of IoT sensors for learning and easy deployment

- Waste management
- Water management
- Snow, ice detection
- Emergency monitoring
- Vehicle counting
- Bike counting
- Temperature monitoring
- Lux reading
- People flow monitoring
- Facility management
- Security
- Remote access management

ESTONIA – CITY OF TALLINN: The first pilot activity was the writing of the report by BIA. The aim of the report was to compare Tallinn City to other important cities in the region from smart city perspective. This list included Helsinki, Riga, Vilnius and Copenhagen. The report looked at where these cities are located in different (smart) city rankings and what are the most notable smart city developments/initiatives in these cities. BIA also conducted a SWOT analysis by interviewing a number of experts from the local smart city ecosystem and using previous analyses, different strategies and the previous Smart-up BSR SWOT analysis. Based on this analysis, BIA provided a number of recommendations for Tallinn City such as supporting real-life piloting, organising smart city hackathons, bigger use of innovation procurements etc.

In addition, the Baltic Innovation Agency developed a smart city project assessment tool for Tallinn City which could be used to assess all new ICT and smart city project ideas. The assessment tool focuses on risk assessment and potential benefits that the project can bring in different areas (economy, governance, environment, people, living, energy efficiency, mobility, ICT). This new assessment tool will play an important role in renewing project development processes in the city. Figure 1 shows how the new process will roughly look like.
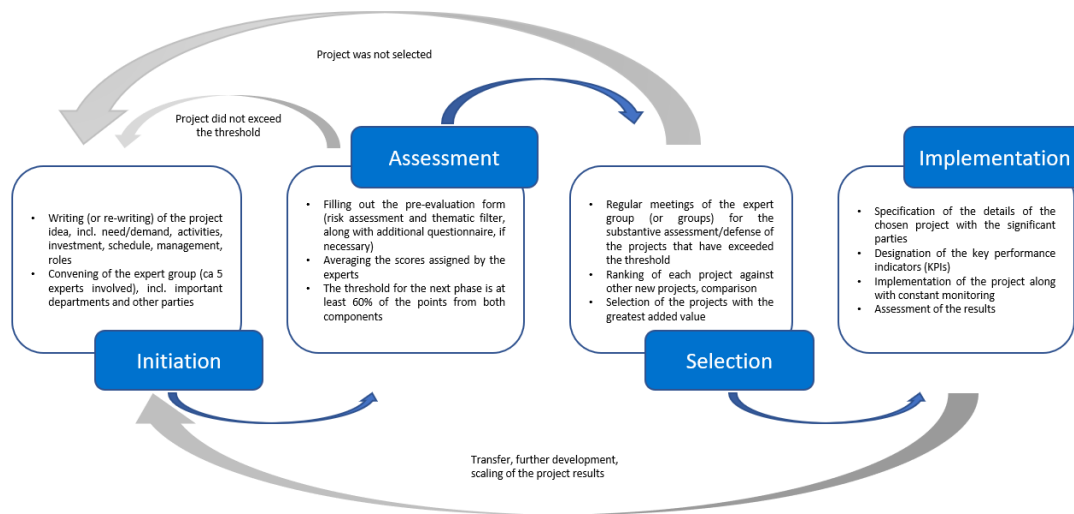
The role of the assessment tool is to provide ex ante evaluation for project proposals. Projects that get a score of at least 60% both through the assessment tool and from the experts will move to the selection round. The selection will be made by a committee which consists of experts from different city departments but also from outside.

FINLAND – HELSINKI-UUSIMAA REGION: August 2019 – Rethinking the pilot as the linkage to the European Innovation Partnership on Active and healthy ageing turned out not be feasible. This was necessary as the City of Helsinki withdraw from the EIP AHA network as a reference site. Decision on the common goal to perform pilot measures for a holistic and cross disciplinary understanding of the Helsinki-Uusimaa AHA ecosystem stakeholders, their insight, expertise and strategic goals. This mapping pilot aims for more effective coordination of local stakeholders´ efforts hopefully leading to novel and new AHA actions, research and innovation.

September-October2019 – Most of the mapping and collecting of data took place. Several informative encounters with professional caretakers and social health expert organizations.

October–November 2019 – First analysis of the result and discussions with relevant stakeholders. Further mapping.

December 2019–February 2020 – Final ecosystem mapping on regional active and healthy ageing actions and compilation of the data and feedback. Links were made to other Nordic organisations that have interest in mapping and the related heavy work related to keeping data fresh for better interest and usability.

AHA Mapping scheme

Piloting the mapping of AHA actors in Helsinki-Uusimaa

LATVIA – MINISTRY participating in num research institutions technology transfer implementation. The projects to the RIS3 national framework.

Cross-regional cooperation was very relevant to learn practices in other countries and regions, as well as to discuss further cooperation and new project opportunities.

LITHUANIA – KLAIPEDA SCIENCE AND TECHNOLOGY PARK & AGENCY FOR SCIENCE, INNOVATION AND TECHNOLOGY (MITA): Partners in Lithuania agreed that the first Pilot event will be Forum and other events will be divided into different themes and will be more interactive and for that it was decided to have a hackathon format.

Forum format was useful for all participants to present their activities, in what stage are BSR region ports, to meet people from different countries with different experiences. At the Forum (20-22 of September, 2019) we got 200 participants from 8 countries and 26 speakers.

Organizing Hackathons is one of the new forms of encouragement of such cooperation, and it became a very popular and effective way to bring all interested parties in one place to find needed solutions. Partners in Lithuania wanted to apply this form of events (hackathon) for the Smart city sector with the focus on the development of solutions, prototypes related to autonomous port, digitalization and automation processes, safety and living standards of the population in the Port area.

"Portathon Baltic 2019" (20-22 September, 2019) brought together professionals and technology enthusiasts of different competencies in the environment open to creativity in order to generate ideas and prototypes applicable in the logistics sector by automating and digitalizing port terminal equipment and various processes as well as developing smart transport ecosystems. The challenge was accepted by 80 participants from 4 countries – Lithuania, Netherlands, Sweden and Germany.

Delta Navy Hackathon (25-27 October, 2019) was very successful, attracted more than 80 participants and created a list of very competitive solutions, that got attention from investors, who participated in the event.

With involvement of main stakeholders of maritime ecosystem, IT/engineering field qualified citizens, it was taken an advantage of innovations to improve safety and living standard of the population by creating the following solutions:

- Personnel monitoring system;
- Laser communication;
- Search/environmental analysis drone (sea launch).

During Delta Navy Hackathon the groups were responding to the challenges in real time, presenting scientifically based solutions, that might be adopted in the practice in the nearest future.

The first price at Delta Navy Hackathon was assigned to the team „VGTU-AGAI2", that created unique solutions for laser-based communication system, that might be used for communication between the ships in cases where radio connection is not possible or forbidden. These solutions are highly applicable for the use of safety and security in port areas. Involvement of scientists and specialists from different fields in the creation of new products for Smart ports is very important part of efficient functioning of innovation ecosystem as well.

4. RESULTS

- Impact for home region
- Impact for BSR region
- Impact beyond the BSR macro region if relevant

DENMARK – CITY OF AARHUS/CENTRAL DENMARK REGION: In March 2018, Aarhus hosted an innovation camp as part of the Smart-Up BSR activities. More than 70 participants from Denmark, Finland, Estonia, Latvia, Lithuania, Russia, Poland, Germany and Norway participated in the innovation camp, which was the first large-scale Smart-up BSR project activity. Over the course of four days, the innovation camp focused on how to cooperate and find common solutions to the contemporary Smart City challenges and allowed the participants to share ideas, experiences and knowledge. The workshops were facilitated by Aarhus ITK and Center for Innovation Aarhus (CFIA) and introduced the participants to the methods, approaches and initiatives, which makes Aarhus a European leader in the area.

ESTONIA – CITY OF TALLINN: The new project development process together with the evaluation tool has not yet been implemented. The potential results as already described in Section 1 can be the following:

- Tallinn City can better evaluate each project's economic impact and link with the city's priorities;
- more efficient and effective use of financial and human resources;
- a thorough overview of projects and resources in use will be established;
- make sure that projects are run on the same principles.

There can be also wider impacts at the BSR region level. On the one hand, when Tallinn City will more carefully select projects where it wants to participate, other organisations/cities in the region might find it difficult to involve Tallinn as a partner. On the other hand, if this new approach helps the city to prioritise human and financial resources, Tallinn City could be involved into larger and more sophisticated projects.

FINLAND – HELSINKI-UUSIMAA REGION: This pilot mapping gave us an updated view of the actors working in the sector of Active and Healthy Ageing. It also gives us information of the specific field they are working on. Without this kind of mapping our connections might be limited mainly to the big companies. The mapping gives us a wider view with small organizations as well. It helps us find best ways for different stakeholders to strengthen AHA networks, to learh from each other aht to form combinations of skills. Sharing the mapping results will give the regions new visions and open collaboration possibilities on the AHA. (See Annex 1 for a list of professional AHA organizations and public services See Annex 2 for a list of Start-up identified AHA -related startup companies)

The pioneering impact of this pilot beyond the BSR macro region may be significant, especially if a common data model is being developed, commitment for a systematic updating of the data is established and the data would be made easily available via an internet hub or portal. We aim for moving into this direction, in conjunction with other endeavours mapping the broader HC actors in certain Nordic Regions and Cities.

We hope to be able to have significantly wider visibility on the results by incorporating a complementary AHA -line into broader mapping exercises we have been involved with (see Fig. 2).
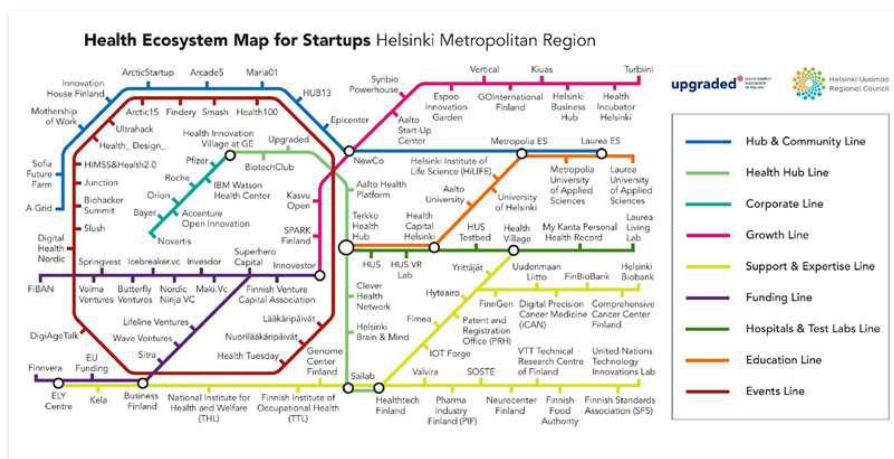

Fig. 2 UIR009-project Mapping of Nordic HC Innovation Ecosystems (Upgraded Association)

FINLAND – KYMENLAAKSO REGION: It was envisaged that port-related piloting would benefit the local innovation ecosystem the following ways:

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- New contacts with new partners/ operators that can bring added value and new expertise to local innovation ecosystem especially relating to port area.
- Boosting the exploitation of new smart/ digital services and applications.
- Upgrading of ICT/ digital operating environment in port area.
- Improving the role of ports in maintaining and attracting new industries and logistic activities to region.

We hope, that the youth council of the city of Kotka will engage in dialogue with the youth network since the city of Kotka is in the middle of the updating process of its climate program for the coming decades and also the youth council will be involved to this process.

LATVIA – MINISTRY OF EDUCATION AND SCIENCE: Major outcome of the pilot was to learn different practices around the Baltic sea in RIS3 planning and implementation, regional capacity building and also to establish new networks. For the MoES it is important because investment and policy focus at R&D is aimed towards international collaboration, competitiveness and excellence through technology and knowledge transfer and sufficient human capital in R&D. R&D capacity development in academic, scientific and business sectors to foster economic transformation is aligned with RIS3 priorities. Latvia aims for higher degree of international co-operation for improvement of position among EU innovators and actual impact of the research, as well as more successful cooperation in international project openings.

The impacts for the Baltic Sea Region are: Cooperation for new project applications (e.g. in circular economy sector) and networking, new contacts.

LITHUANIA – KLAIPEDA SCIENCE AND TECHNOLOGY PARK & AGENCY FOR SCIENCE, INNOVATION AND TECHNOLOGY (MITA): Implementation of pilot projects, stakeholder engagement and diverse operational activities in the region are the key factors in moving the smart specialization approach to the center of the regional transformation processes. Active engagement of target groups and ecosystem stakeholders in the activities organized is essential for the success of implementing smart specialization policies. Numbers of participants in the events shows motivation and commitment, that are also key facets of the mindset, needed to elaborate this process.

The process of pilot projects implementation brought many important achievements:

On the basis of the interim evaluation there was prepared updated version of The Programme on the Implementation of the Priority Areas of Research and (Socio-Cultural) Development and Innovation (Smart Specialization) and their Priorities, that was approved on the 24th of July, 2019 by the Resolution of the Government of the Republic of Lithuania No 760. Due to the efforts of stakeholders and key players to show potential of smart and integrated transport activities, the separate priority for Smart, Green and Integrated Transport, was included in the updated version of the Programme.

Pilot activities also increased awareness of regional representatives from private and public sectors as well as citizens, about what does it mean to be the part of place-baced innovation ecosystem and smart specialization process. It also increased their understanding of the benefits of actual participation and raised the level of motivation for taking active and constructive steps in the processes.

Pilot activities provided also very practical experience and skills on how to organize events, engage different stakeholders, find various challenge angles that would motivate participants to take active role in the processes.

Pilot projects enhanced commitment, helped to build new skills and competencies for organizers and co-organizers of events -KSTP and MITA. Both institutions gained competencies in many different areas: use of new innovative tools (Hackathons) and ecosystem thinking for encouragement of emerging place-based ecosystem, transnational cooperation and open innovation processes, mindset of experimentation and change management instruments to assure the transfer of best practices into activities implemented. Project pilot activities also helped KSTP to increase their role as key player, uniting stakeholders of maritime sector in the region.

Impact for BSR region: Activities of the Pilot project helped to create a network of maritime innovators as well as to develop unique solutions for maritime cities/regions. This directly related to the implementation of RIS3 in the region. Appearance of new solutions for autonomous ports, safety and security strengthens the competitiveness of the Region and contributes to the Ports cities of whole BSR.

The range of solutions provided by the teams at the "Portahnon Baltic 2019" was extremely wide – autonomous electric ferry, mobile application for the management of truck terminal, underwater drone, inland container barges reservation system, joint service and resource acquisition system, a mathematical model for more efficient organization of work in ports, technical solution for dust removal when handling bulk cargoes, and a robot for measuring and analyzing potential pollution.

The first prise at Delta Navy Hackathon was assigned to the team „VGTU-AGAI2", that created unique solutions for laser-based communication system, that might be used for communication between the ships in cases where radio connection is not possible or forbidden. These solutions are highly applicable for the use of safety and security in port areas. Involvement

of scientists and specialists from different fields in the creation of new products for Smart ports is very important part of efficient functioning of innovation ecosystem as well.

All these solutions elaborated during hackathons have potential to become internationally attractive products, that might be applied in other Ports of Baltic See and so to contribute to more environmentally friendly, safe and innovative BSR.

Smart up BSR project created active network of experts from three Baltic ports: Klaipeda, Kotka and Gdansk-Sopot-Gdynia, who were sharing their knowledge and insights about possible solutions to existing challenges, ways to encourage emerging of innovative ecosystem in the Ports. Active cooperation between Smart up BSR project partners, openness and sharing of knowledge about innovative solutions, elaborated in the pilot actions, might be implemented internationally and could lead to the development of Smart ports network in whole Baltic See region.

5. PERSPECTIVES OF OUTCOMES

- Learnings from perspectives of organizers, those who worked for the implementation
- Learnings from perspectives of participants (desired outcomes as expressed by participant/participating organization in the pilot)
- How did cross-regional activities take place? (eg. planned or emerging)
- Surprises
- Disappointments
- Lessons for follow-up implementations

DENMARK – CITY OF AARHUS/CENTRAL DENMARK REGION: During the numerous innovation camps in Smart-Up BSR we have gained deep insights into the local challenges and opportunities of the hosting cities and regions as well as those of the other participant's and have thus been forced to view our own challenges and opportunities in a new light.

The network established through our participation in the Smart-up BSR activities, innovation camps and pilots, have proven of high value as we have been able to extract learnings from other regions that are strong on these kinds of cross sector, cross function collaborations. One example is our visit to Forum Virium during the Espoo Innovation Camp where we had the opportunity to discuss different approaches to collaboration, innovation and organization with them. Furthermore, we have utilised the SmartUp-BSR network to research on other successful partnerships in the Baltic sea region and will continue to do so going forward. The interpersonal relationships that the SmartUp project has helped establish are of high value for the future.

ESTONIA – CITY OF TALLINN: The actual implementation planned for summer 2020 has been postponed because of the Covid-19 and structural changes in the city government as mentioned earlier when presenting the different aspects of establishing the pilot in the first section.

FINLAND – HELSINKI-UUSIMAA REGION: The key benefits of the mapping tool and the actual ecosystem map are

- Facilitating a more coordinated and timely development approach, agenda, and priority setting
- Allowing learning from close but currently siloed partners
- Improving and catalysing personal contacts and matching interests avoiding double or suboptimal efforts

Our original idea was to link this pilot to the work of European Innovation Partnership of Active and Healthy Ageing (EIP on AHA). During the planning process the status of our region within the partnership changed and updated the pilot accordingly. Anyway, that didn't change our basic need for mapping the stakeholders.

One of the main learnings of this process was, that the work needs to be adequately resourced. Even when we have the information collected putting it into informative and user-friendly format requires professional skills. That is why we will still work with the final format of the mapping.

FINLAND – KYMENLAAKSO REGION: Some lessons learned during pilot planning from Cursor Oy´s point of view:

- It has been a bit tricky in the beginning to figure out what is meant by pilot planning.
- The fact that project has no earmarked budget to execute new pilots causes difficulties in selling the idea to potential regional pilot partners (how to do something without money).
- Finding out already ongoing development plans/ initiatives where Smart-up BSR expertise would bring added value to the region takes quite a lot time.

Cursor Oy strived to promote cross-regional cooperation by inviting HaminaKotka Port representatives and representatives from companies operating in port-related business to attend Gdansk and Riga camps. Representatives from regional Youth Council were also invited to participate in Gdansk and Riga camps.

Unfortunately, the development of the port related pilots has not progressed as desired, mainly due to the challenging schedules of region´s relevant actors (participation in innovation camps has not been possible due to overlapping obligations; maybe this could have been avoided partly if the program and challenges of the camps could have been published earlier. Presently COVID-19 pandemic has affected heavily on region´s port activities and operators and promoting cross-regional pilot cooperation is not realizable. Promoting and participating in cross-border network of youth pilot seems instead much more potential. COVID-19 pandemic naturally hinders physical meetings, but pilot leaders are striving to arrange a video conference during May with hopefully numerous participants from BSR countries.

Projects have traditionally been the most important means of regional development in Kymenlaakso region. Nowadays access to structural funding is constantly tightening and competition for funding between different actors is also becoming more intense. International cooperation and joint projects, like Smart-up BSR, will play even a bigger role in the future.

LATVIA – MINISTRY OF EDUCATION AND SCIENCE: Sector specific information regularly needs to be updated and overlooked in at least regional context for better and more accurate focus and engagement with all the stakeholders

(policy makers, R&D sector, entrepreneurs, students and general public), providing updates on challenges and opportunities.

LITHUANIA – KLAIPEDA SCIENCE AND TECHNOLOGY PARK & AGENCY FOR SCIENCE, INNOVATION AND TECHNOLOGY (MITA): All pilot projects were good examples that helped to test existing innovation ecosystem: starting initiation of events, testing of networks and cooperation between different stakeholders, response of science and business people, legal framework as well as financing instruments, that might be offered for the teams in all stages of product development.

The main lessons learned from the piloting actions concentrate on:

- the need for more focus on experimental development and innovation;
- closer networking with mentors, experts;
- improvement of financial motivation system for R&D&I activities and appearance of funding possibilities for attracting of professional mentors/ experts to work with the teams.

The pilot showed that for many innovative companies, working on international level for many companies still is some kind of challenge and many companies are still not prepared to take advantages of emerging opportunities. Even if all logistics to participate in the events were organized and free of charge, public authorities put a lot of efforts to advertise and promote pilot events (e.g.Portathon 2019), still many participants from neighbouring countries have not succeeded to take part in this event.

At the same time, it was very useful to hear two different opinions from quite big international companies about experiences gained during participation in pilot activities. They took part in the Pilot very actively and we, as organizers received very positive feedback about how it was useful to work in teams with peoples from different fields. In one team there were students, scientists and business representatives. But at the same time there was a reflection from some companies about the reasons to refuse participation in the events. There are still a lot of fear to share own ideas and to participate in the brainstorming and creation of new prototypes.

6. SUMMARY AND FUTURE OUTLOOK

- Summary of knowledge gained
- Beneficiaries of the new knowledge
- Follow-up decisions

DENMARK – CITY OF AARHUS/CENTRAL DENMARK REGION: The Danish government passed the reform to the Regional Business Development system, which meant that the Regions could no longer engage in activities which promotes business. It also meant that the Smart Specialization Strategies, which had previously been formulated by the Regions, would now be formulated at the national level by the Danish Business Authority. Up to this point, the Region of Central Denmark had been an associate partner, but the reform meant that although the Region would continue to be involved with the pilot for certain aspects, they could no longer participate as associate partner in Smart-up BSR. The pilot therefore had to be rethought.

Alongside this, a project group headed by Aarhus Municipality began to develop an idea to create a transregional unit to cooperate on IoT and smart cities strategically and at a larger scale than what is possible in the individual municipalities. This process has been ongoing for a while but began in earnest in the fall of 2019. During the process, the project group developed a more nuanced concept of smart cities with the introduction of GovTech and it was agreed that the center should focus on enabling the public authorities to explore, test and implement emerging technologies. As part of this process the stakeholder ecosystem around the GovTech Center was orchestrated and small coordinating meetings was arranged.

The kickoff meeting was held 9. March 2020 and was attended by chief digital officers and consultants from 15 municipalities, directors from Business Region Aarhus and Business Region MidtVest and Heads of Offices from the Region of Central Denmark. A total of around 30 professionals attended the kickoff meeting. The meeting was structured with presentations with several workshops in between. The workshops were designed and facilitated by Center for Innovation Aarhus (CFIA). The workshops were intended to clarify the aims and activities of the center, the barriers for implementation and to determine a governance model, including the organization and budget. See the pictures below to see the material that was used in the workshops.
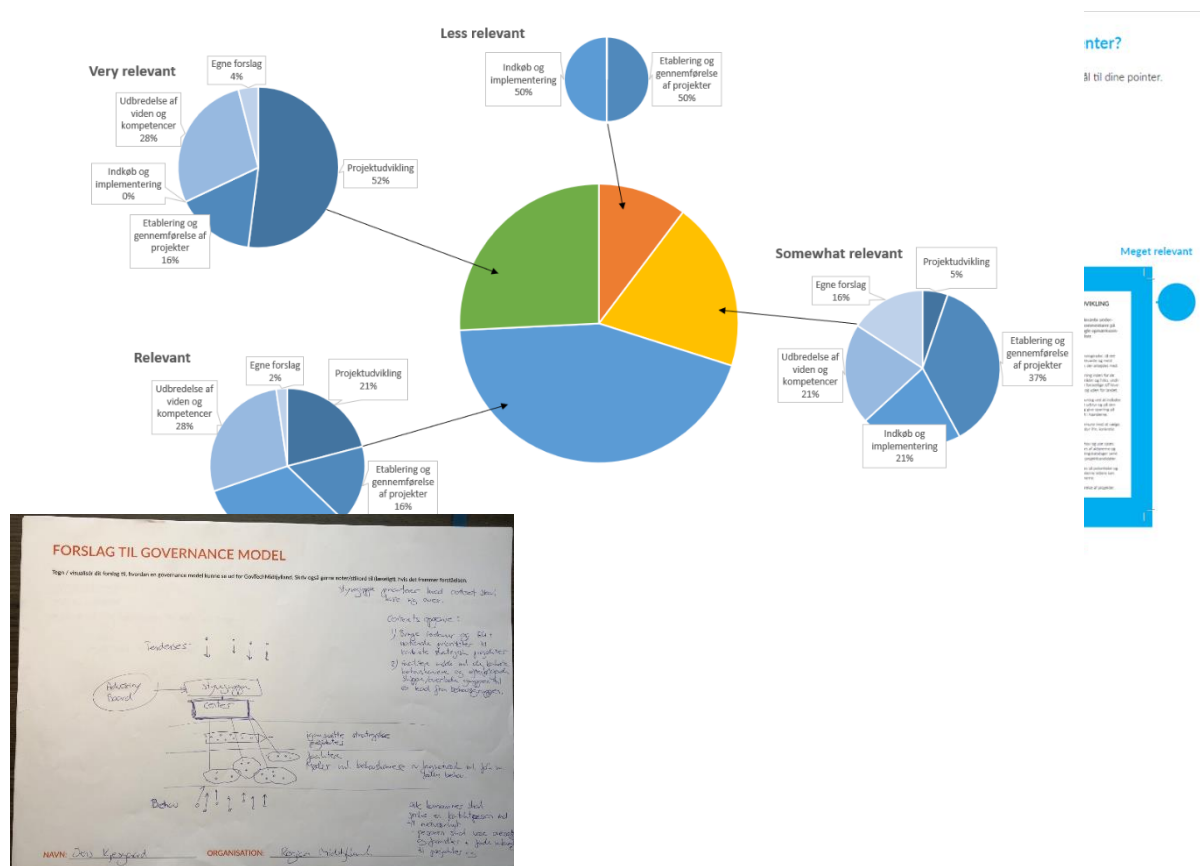
As of May 2020, we are in the process of seeking formal commitment from the stakeholders and are elevating the strategic level by involving the Municipal Chief Executives.

The GovTech center will complement the individual municipalities' strategic work with Smart Cities and the national and regional priorities in the new Business Development Strategy, which is considered the Smart Specialisation Strategy.

FINLAND – HELSINKI-UUSIMAA REGION: This pilot mapping gave us a view of the actors working in the sector of ageing. It also gave us information of the specific field they are working on. With this information we can develop further the orchestration of the AHA ecosystem in the region. This is also a very helpful tool in building international connections and finding right partners regionally and internationally.

In the future we need to decide is and how to update the mapping regularly. To gain attention, the most useful approach would be to make it available in the web and have it updated regularly. This is a known challenge for all mapping exercises, and we are keen to tackle this together with potential users and technology providers, pending of resources and interest. Current mapping will be distributed to the attention of the relevant networks and actors.

LATVIA – MINISTRY OF EDUCATION AND SCIENCE: Currently the MoES is working on new policy planning document that will revise and update existing RIS3 strategy for next funding period. It is very likely that implementation of related activities will be changed accordingly.

The RIS3 strategy for Latvia has been already in the implementation phase, but will be adjusted later this year. With each innovation camp MoES experts gain new experience on how to tackle different aspects of RIS3 development and implementation, e.g. societal challenges in the region, ways on establishing dialogue between stakeholders, coordinating the bottom-up process, etc.

By participating in the innovation camps, the Smart-up project manager and RIS3 experts from the MoES gained insights and knowledge based on societal challenges that need to be considered when performing the monitoring of Latvian RIS3 strategy and implementation of related activities.

LITHUANIA – KLAIPEDA SCIENCE AND TECHNOLOGY PARK & AGENCY FOR SCIENCE, INNOVATION AND TECHNOLOGY (MITA): The Smart City – Smart Port Pilot was useful for Klaipeda Sea Port authority and Klaipeda region. By implementing the Pilot, all parties – science, business and municipality could exchange their vision of smart port. Klaipeda Port authority identified their advantages and weaknesses comparing with other BSR ports. Klaipeda region accepted the main goal of the Port to become autonomous port.

Pilot activities facilitated increase of certain knowledge among KSTP and MITA. Representatives from MITA gained very interesting knowledge and experiences how to co-organize and take active part (as mentors and experts) in hackathons, encourage building of quite unique innovation ecosystem in quite closed and specific navy sector, evaluating possibilities to adopt new solutions, proposed by the winners of Delta Navy Hackathon to Port and Smart City areas.

Pilot activities also increased awareness of regional representatives from private and public sectors as well as citizens, about what does it mean to be the part of place-baced innovation ecosystem and smart specialization process. It also increased their understanding of the benefits of actual participation and raised the level of motivation for taking active and constructive steps in the processes.

Pilot activities provided also very practical experience and skills on how to organize events, engage different stakeholders, find various challenge angles that would motivate participants to take active role in the processes.

Pilot projects enhanced commitment, helped to build new skills and competencies for organizers and co-organizers of events -KSTP and MITA. Both institutions gained competencies in many different areas: use of new innovative tools (Hackathons) and ecosystem thinking for encouragement of emerging place-based ecosystem, transnational cooperation and open innovation processes, mindset of experimentation and change management instruments to assure the transfer of best practices into activities implemented. Project pilot activities also helped KSTP to increase their role as key player, uniting stakeholders of maritime sector in the region.

One of indirect results from Smart up BSR project pilot activities is increase of visibility of Maritime sector among RIS3 stakeholders and inclusion of additional priority "Smart, Green and Integrated Transport" in updated version of the Programme on the Implementation of the Priority Areas of Research and (Socio-Cultural) Development and Innovation (Smart Specialization). Now actors of Klaipeda region innovation ecosystem have to take an advantage that occurred in the strategic documents and take initiative to boost the sector and make Klaipeda – frontrunner of smart Ports.