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# Balanced and sustainable economic development – the innovation collaboration in the Arctic

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**The Arctic and other peripheral regions are continuously challenged by the global megatrend of urbanization. The viability of these northern regions requires intentional actions and decisions. The existing economic policies resort to the exploitation of natural resources in the Arctic. The concept of regional innovation system is presented in this paper as an alternative to the resource-oriented approach. This study is based on qualitative data (interviews, analysis of strategies, documents and reports) as well as the quantitative data of regional economic development.**

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There are different approaches to the Arctic. Natural resources and their exploitation are the usual foci of the economic discourse and practices, while sustainability and environmental issues tend to dominate the arenas of political and strategic discussions [1]. Reliance on the non-renewable raw materials is obviously a risky strategy and even more so if activities connected to exploitation of these raw materials pose a potential threat to vulnerable environment. Therefore, this article presents a feasible alternative to building the future of the Arctic increasingly on innovations and hence relieving the dependence on natural resources.

Arguably, it is possible to increase the effectivity and efficiency of activities in research, development and innovations (RDI) by reorganizing and redefining already existing resources and abilities related to RDI. To create a functional innovation system, there needs to be more focus on narrowing the gap between the public and private sector. The authors' recent research activities have focused on studying how to exploit all the possible competitive advantages through innovation activities.

In this paper, the innovation system approach is applied to the arctic context. The key elements of the innovation system can be easily found in the cities of Oulu, Tromsø and Luleå and these regions already have strong foundations for RDI and a lot of innovation activities. Moreover, these Arctic innovation hubs have many similarities in terms of population and economic structures. Based on an in-depth analysis of innovation system in Oulu and a preliminary view of regions in Tromsø and Luleå, a model for a network of Arctic innovation hubs is presented. Conclusions contain suggestions for the next steps in building such a network. This article is based on the authors' presentation in the Arctic Frontiers conference held in Tromsø, Norway 21.–24.1.2019.

## Regional development, policy options and innovation systems

Urbanization is one of the most undisputable megatrends governing regional development in all locations. In 2007, the global urban population exceeded the rural population for the first time in history [2]. Moreover, it is also well documented that urban regions differ in terms of growth and development. Centralization of population to few metropolitan regions generates several challenges – to both growing and declining regions. Such development may act as a call for policy actions. In other words, regional policy starts with a decision to even out regional differences. In general, there is a wide selection of regional policy tools available to decision makers. From an economic point of view, these policy tools can be divided into two categories: direct (subsidies, transfers, public investments, expenditure) and indirect (induced RDI, Platforms and incentives to innovations) [3].

In Finland, regional policy tools have evolved in three stages (see e.g. [4] [5] [6]). These stages consisted of the industrialization policy of 1960s, the planned regional development policy in 1970s and 1980s, and, eventually, as a third stage, the policy of regional development programs in 1990s. The first two stages emphasized the direct regional policy tools, whereas the third, current stage represents the application of indirect tools. The current regional policy is focusing on collecting development activities into larger entities and strategic coordination (see e.g. [7]). The most recent development in Finnish regional policy has been focused on inventions and innovations as sources of development. One descriptive concept connected to regional economic development is resilience, which means the capacity of a regional economy to withstand and recover from external shocks. Regional resilience also refers to the region's ability to reorganize in cases of disruptions [8]. Preliminary evidence seems to confirm that continuous RDI activities form a strong platform for a resilient regional economy [9].

Innovations can be defined as new services, products, processes or organizational innovations (see e.g. [10]), and they may stand for new solutions, employment, sustainable economic growth and social wellbeing. From a regional economic perspective, the innovation system is a useful concept. The key elements of innovation system are a strong knowledge base, the network of innovation processes, various innovation resources and informal interaction [11] [12]. In this analysis, entrepreneurs, companies, investors, universities and government organizations are the actors of the innovation system. The actors employ incubators, living labs, testbeds, R&D services and infrastructure, forums, funding and knowledge intensive business services, and other arenas and services of the innovation system [13].

## Building an Arctic innovation system

Oulu Innovation Alliance (OIA) represents an interesting, practical example of the evolution of a regional innovation system. In the early 2000s, the strong dependence of regional economy on the mobile industry was interpreted as a threat, and various activities to secure RDI resources in the future were initiated. Obviously, decision makers were already then aware of the importance of innovations to economic growth and well-being.

In 2008, the central RDI-actors in the region launched a process to ensure favorable conditions for more efficient innovation activities. The result was an establishment of innovation centers based on different

spearheads and focusing on the accumulation of RDI funding and increasing intellectual capital and know-how. These centers formed the core of the first stage of OIA.

Decline in the mobile industry in 2009-2012 sped up collaboration between different actors in the field of RDI. In 2015, a new stage for OIA was introduced with an operational model replacing separate innovation centers with innovation ecosystems, and hence signaling the importance of co-operation in the functional innovation system. Moreover, this latest stage of OIA highlights commercialization as a crucial element in transforming RDI activities into economic growth.

Although there are only indicative results from the first years of the newly formulated OIA, the outcomes seem positive. The number of annually established companies has risen to highest figures ever measured [14]. In addition, the level of RDI investments have remained stable and high – with RDI expenditures per capita being highest in Finland [15]. These findings, combined with growing interest of venture capitalists toward Oulu-based companies [16] implicate that the development of regional innovation system has been on the right track.

The diversification of innovation activities between different actors and the selection of strategic spearheads of innovation activities have increased the resilience of regional economy and created opportunities for the innovation system management. This development is shaping the future of OIA as an innovation system.

## The Arctic co-operation through a joint innovation management system

Dissemination of the best practices and gained experiences is a key element of the development of the regional innovation system. On the other hand, it is widely recognized that each region requires specific solutions a one-size-fits-all strategy does not work in regional development.

As long as the future of the Arctic is assumed to be built on RDI competences and smartness, innovation system approach to regional development seems relevant. The Arctic innovation hubs in Oulu, Tromsø and Luleå share a common understanding in the importance of RDI and commercialization of research results. On the other hand, these Arctic innovation hubs have specialized in different areas of innovations and innovation process [17]. Therefore, there are opportunities (due to joint interest in effective RDI) and incentives (due to regional smart specialization) for more intensive co-operation between hubs.

OuluHealth and Agile commercialization innovation ecosystems of OIA have built a model for an ecosystem-wide innovation management. The model consists of harvesting ideas through a digital platform, assessment of ideas by a multi-disciplinary team of experts in innovation management team, and coordination of further development of ideas. At the moment, the innovation processing model and idea management tool are piloted and innovation management team activities start in autumn. [18] This model seems a viable platform for Arctic collaboration. Cross-border collaboration of innovation hubs could work in multiple sectors, covering different RDI spearheads. This adaption of innovation system would mean emphasis on the Arctic issues and ideas, and therefore the innovation management team would include a multidisciplinary set of actors from academia, RDI and practioners. Moreover, ideas and launched development processes could flow between regions according to needs – ideas from Oulu could go to Tromsø to be developed further, and finally to Luleå to be commercialized. The model for networking of Arctic innovation hubs is illustrated in figure 1.

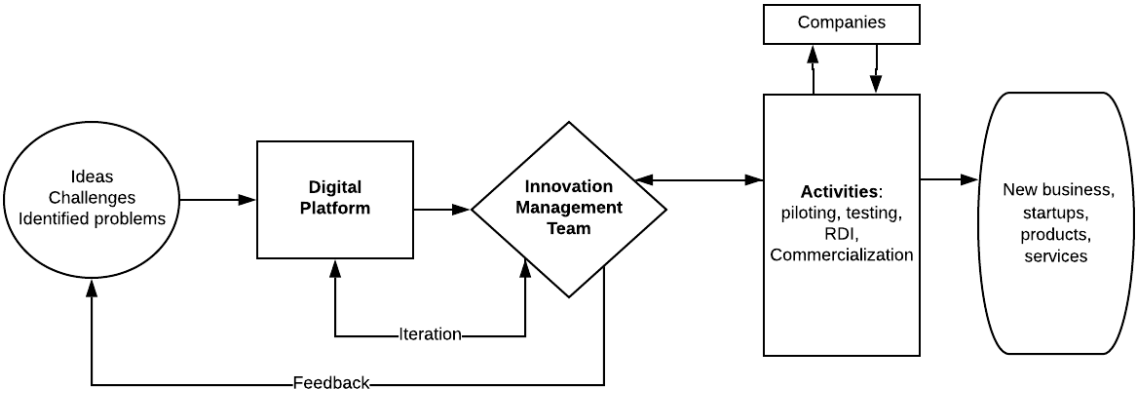


FIGURE 1. Innovation network model of Arctic innovation hubs

## Conclusions

There is increasing consensus about the importance of RDI to sustainable growth and welfare. In terms of regional development, the local arrangements for innovation activities are crucial when building a resilient regional economy. Oulu Innovation Alliance is a unique platform for development and experimentation of the different elements of a regional innovation system. Different stages of the Alliance reflect the grand design of Finnish regional policy and achieved results have been comprehensively tested by shocks to regional economy. Therefore, the practices and solutions developed in Oulu Innovation Alliance would be valuable elements in Arctic collaboration.

The proposed model for Arctic innovation management system seems reasonable and even feasible. Sharing innovation services and facilities between these peripheral regions would increase opportunities for growth based on innovations, instead of growth based solely on non-renewable resources. The future of the Arctic is depending on the attractiveness of the regions and merging Arctic innovation hubs would undoubtedly create platforms for intriguing innovations.

To proceed, it would be beneficial to study each of these Arctic innovation systems in an even more detailed manner. This analysis is required to secure that each region has sufficient means to participate in different steps of the joint innovation system. A digital platform for ideas from commonly decided sectors would be open to all participating regions, and an innovation management team would contain experts from each region. Probably, the decisive factor of success for this proposed innovation network model is the functionality of development activities after processing of ideas in the innovation management team. To conclude, the focus of the development should be on the innovation and commercialization services and infrastructures in the regions.

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participatory innovation process is developed and joint idea management tool is deployed. Oulu University of Applied Sciences, University of Oulu, BusinessOulu, City of Oulu and Oulu University Hospital have made an aggreement on deploying innovation model and developing and maintaining digital platform in the future.

**Metatiedot**

**Nimeke:** Balanced and sustainable economic development – the innovation collaboration in the Arctic

**Tekijä:** Longi Henna; Niemelä Sami

**Aihe, asiasanat:** collaboration, innovation systems, innovations, regional development, regional policy

**Tiivistelmä:** The Arctic and other peripheral regions are continuously challenged by the global mega trend of urbanization. The viability of these northern regions requires intentional actions and decisions. This paper presents a new approach, regional innovation systems, to meet the challenges as an alternative to existing Arctic economic policies resorting more on the exploitation of natural resources in the Arctic. This study is based on qualitative data (the interviews, the analysis of strategies, documents and reports) as well as the quantitative data of regional economic development. This article is based on the authors' presentation in the Arctic Frontiers conference held in Tromsø, Norway 21.–24.1.2019.

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