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**External impulses supporting innovation in
Stockholm**

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1. Introduction

Stockholm has been named as the most innovative region in the European Union according to Regional Innovation Scoreboard 2017 of the European Commission, which evaluated national innovation systems. (European Commission 2018a) According to the Action Programme for the Stockholm Region, the city built its reputation as the most innovation-driven region by formulating several pillars it focuses on: being attractive to global businesses and individual entrepreneurs as a one of the most advanced markets, building a sustainable and economically stable society not jeopardizing the potential and opportunities of the next generations, being open and supporting unorthodox thinking, and having an open and creative climate supporting innovative ideas. (European Commission 2018b)

“The region’s innovation ecosystem—its collection of technical talent, firms, universities, research institutes, and industry intermediaries—outperforms metropolitan peers on metrics of commercial inventions and university-industry scientific collaborations.” (Parilla et al. 2015) To take advantage of the regional innovation potential and develop it further, Stockholm has been investing in the international accessibility in order to attract international experts and businesses. This includes investment into living and residing in the Stockholm region. (European Commission 2018b) The “Stockholm 2025”, an action plan to develop the innovation potential of the region, focuses on five main aspects (European Commission 2018b)

- research and innovation infrastructure
- innovation procurement
- supply of capital
- cross-sector approach
- global attractiveness

Within the “research and innovation infrastructure” initiative, the region has been developing an inventory of the existing research and development infrastructure to assess the degree of utilization of its potential. Moreover, a creation of a regional platform to market the research infrastructure to companies, mainly SMEs, makes the innovation impulses more assessible. Finally, open public data would be provided to companies to maximize the knowledge transfer necessary

to increase the innovation rate in the region. Another initiative is to “create a regional platform for innovation procurement that offers knowledge, exchange of experiences, a contact network and dialogue for the region.” (European Commission 2018b)

Stockholm has also been named the “Capital of start-ups” and “Second Silicon Valley in Scandinavia”. (Carter 2015; Schiller 2018) Internationally successful companies such as “Volvo, Saab, Ericsson, IKEA, H&M, ABB, Husqvarna, Skype, Spotify, Linux, Mojang, MySQL, Wrapp, Klarna, Memeto and LifeSum” all come from Sweden, with Stockholm being the main innovation hub. (Carter 2015)

2. External impulses supporting innovation

The Swedish government has been actively supporting the innovation potential of the region; with large investments into industries, as well as supporting the population, for example, by promoting policies helping households to purchase computers in order to increase the computer literacy among the population. Sweden has one of the top spending to research and development among the EU states. (Sweden 2018) Moreover, “the country's broadband internet connections are among the world's fastest, which has allowed local businesses to participate on the global start-up scene...With an open metropolitan network comprised of 1,200,000km of fibre optic cable – which could wrap around the earth 30 times – exciting young businesses are popping up all across the city.” (Carter 2015) Stockholm was named number one “networked society city”, and 90% of population and 100% of businesses use fiber-optic communication. (Schiller 2018) The city decided to strategically focus mainly on the bioscience, technology, climate, and medical industries. (Sweden 2018) In the following chapters, the author will focus on the specifics of the innovation infrastructure and external impulses that make Stockholm stand out above other European regions. These relatively unique impulses allowed the region to develop and utilize its innovation potential and Stockholm might act as a role model for the regions willing to improve their competitiveness by advancing their innovativeness.

2.1. Development of future generation innovation potential

One of the reasons that Stockholm is the most innovative region in the EU is the focus on the youth development and education. Except for having one of the highest percentage of population aged 30-34 with tertiary education, Stockholm is

also a home to one of the largest proportion of population aged 25-64 participating in lifelong-learning; both factors directly influencing the innovation rate and potential of the region. (European Commission 2018a) However, the government is actively encouraging the interest of youngsters in technology and entrepreneurship. The IT skills are actively promoted at schools, and as the result, “the most common job role in the city is programmer-coders make up 18% of the workforce.” (Schiller 2018; Swedish Wire 2018)

1.1.1 Finn up

Finn up is a youth program founded in 1979 by an engineering interest group Ingenjörssamfundet to support and encourage problem solving, creativity, and inventing skills among Swedish students in grades 6-9, in order to create a future generation of innovators, using textbooks and digital learning tools. (Sweden 2018) The schools are supplied with learning materials, and the learning process has five main stages; “Start, Idea, Research, Design and Realize”. The students can participate in state-wide competitions where they present their inventions and ideas. (Finn up 2018) This way, Finn up aims to prepare the students for the future working life and increase the innovativeness of the country.

1.1.2 Ung Företagsamhet

The non-profit organization called Ung Företagsamhet (“young entrepreneurs”) is an educational organization founded in 1980, training high-school students to become entrepreneurs. The program focuses on students aged 16-20 and it enables them to run their own company for a year as a part of their studies. Local studies shown that participants show higher rate of creating and running a successful business later in their life. (Sweden 2018; Ung Företagsamhet 2018)

1.1.3 Snilleblixtarna

The non-profit organization Snilleblixtarna (“flashes of genius”) focuses on a student group from preschool to 5th grade. Their aim is to encourage entrepreneurship, invention, and interest in technology, science, as well as the creativity and curiosity of children. (Snilleblixtarna 2018)

2.2. Networks supporting business and academia cooperation

There are several networks ensuring fruitful cooperation of academic bodies and businesses (state-owned as well as private) in order to utilize the research and development potential in order to transfer and apply knowledge. One of the

organizations in this network is KK-stiftelsen, which creates conditions for innovation and creativity to stimulate the competitiveness and strengthen the links between academia and industries. SSF (Swedish Foundation for Strategic Research) is an independent organization supporting research in technology, engineering, and medicine. Vinnova (Swedish Governmental Agency for Innovation Systems) supports innovation, research and development in the spheres of biotechnology, communication technology, and materials, and transportation. Its aim is to support the transfer from an idea to a development of the actual product introduced to the market. (Sweden 2018)

2.3. Start-up and corporate collaborative platforms

Companies in Stockholm has an opportunity to participate in events and collaborative platforms supporting innovation. One of the most well-known is Ignite Sweden, a collaborative platform and a national initiative, co-founded by Swedish Governmental Agency for Innovation. The goal of the platform is to establish “tighter bonds between the vibrant start-up scene and the thriving, established companies...to increase the pace of innovation and economic growth”. (Ignite Sweden 2018) The platform aims to match start-ups to corporations to help the form a meaningful a fruitful collaboration and to help start-ups to find their first large customers. The initiative is a cooperation between several innovation actors, such as

- THINGS- the number one hub for hardware and industry-oriented entrepreneurs, start-ups and scale-ups in Sweden, which is based in Stockholm and focuses on Internet of Things, Automation, Robotics, 3D scanning/printing and Energy. (THINGS 2018)
- STING- the best accelerator and incubator for start-ups in Sweden, which offers help in spheres of coaching, financing, recruitment, networking and community, marketing, PR and communication. (STING 2018)
- LEAD- a company supporting start-up with innovative ideas by providing them services and resources for a quicker and more successful growth of business. (LEAD 2018)
- and others.

2.4. Innovation Systems and Innovation Offices at universities

Local universities have been creating infrastructure to support innovation among students and university staff. The Stockholm University established The Innovation System and The Innovation Office that helps students and employees

to transform their innovative ideas into innovations, and to transfer the knowledge to the public. "The Innovation Office offers advice and guidance in innovation combined with various educational and inspirational activities... The Innovation Office provides advice on issues related to intellectual property rights (IP), agreements, opportunities and strategies for utilization, packaging and presentation of ideas, funding opportunities and business development. The Innovation Office also has some scope to give financial support for the verification and validation of ideas." (Stockholm University 2018) The Holding Company, commercial company managed by the Stockholm University offers the opportunity to obtain investment for the companies originating or affiliated with the university. (Stockholm University 2018)

3. Other impulses supporting innovation in Stockholm

There are other impulses supporting innovative behaviour among the businesses and individuals in Stockholm. Those cannot be attributed only to the business and economic environment, but to the overall culture in the city. The culture in Sweden promotes collaboration and teamwork. "Erik Stam, a professor at the Utrecht University School of Economics, says that Swedes have high levels of trust in one another relative to other countries, which means they're less likely to require complicated contracts to work with one another and which makes collaboration easier. There's also an argument to make that because of this trust, supervisors tend to allow employees flexibility in what they do at work, which can spark new ideas." (Semuels 2017) According to the Stockholm's Research Institute for Industrial Economics, "28 percent of working adults were involved in an intrapreneurial activity in the last three years, compared to 11.7 percent of Americans". (Semuels 2017) According to a study funded by the European Union, "Sweden comes second only to Denmark for "intrapreneurship" – loosely defined as collaborative, innovative working within companies by employees". (World Economic Forum 2017)

Moreover, the geographic proximity due to a relatively small city enables companies to collaborate with each other and to seek help and advice from well-established and globally successful ventures, such as Spotify. Furthermore, the social security provided by the governmental structures results in a low-risk environment, encouraging the citizens to venture into new business ideas. "University is free, and students can get loans for living expenses, which allows anyone to pursue higher education. Health care is free too, and childcare is heavily

subsidized. None of these benefits are contingent on having a job, which means people know that they can take entrepreneurial risks and still know many of their necessities will be covered." (Semuels 2017)

4. Conclusion

The environment in Stockholm has several key aspects supporting innovation. To the most prominent external elements encouraging innovative behaviour belong the overall focus of the regional development and investment plans to increase the global attractiveness of the region to obtain experts worldwide as well as supporting the research and development infrastructure, computer literacy and tertiary education of citizens. Moreover, the city established numerous programmes to involve youngsters in creative activities and to promote entrepreneurship and innovation among students. Furthermore, Stockholm is known for its well-developed and collaborative start-up scene, collaboration platforms, and numerous successful incubators and labs. Companies are also able to obtain a large variety of funds and financial help from programmes and university-affiliated companies and innovation offices. Last but not least, the overall culture in Stockholm is that of collaboration and "intrapreneurship". The citizens feel secure in their daily lives due to the national system and are therefore more likely to engage in innovation and set up their own company to bring their innovative ideas to the market.

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