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## Digitalization and Development of Digital Technologies in Scandinavian Countries

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**Mykola Melnyk**

Vistula University in Warsaw, Poland (*Corresponding author*)

E-mail: melnyk.polska@gmail.com

DOI: <https://doi.org/10.32782/2707-8019/2022-1-2>

***Abstract.** It is stated in the article that digitalization has social, economic, and environmental implications. The value of ensuring equitable access to new technology, in the first instance, the Internet, should be addressed when building digital infrastructure. The Nordic countries is a big perspective market for e-commerce, although they are not the obvious target market for e-commerce expansion plans, mostly because of the language issue. In the Nordic areas, smart city technologies have already been introduced as early adopters of sound information and communication technology. At the national level, all Nordic countries have implemented digital policies or strategies. Nordic digitalization and automation represent a huge opportunity for a better manufacturing situation.*

***Keywords:** digitalization, digital technologies, e-commerce, digital infrastructure, manufacturing.*

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### 1 Introduction

The digital era we live in is ruthless for those who are still lags far behind in terms of technological development. Today's reality of business is an acceptance of the fact that "every business is a digital business", which is also taken as the moto. This means the Internet has penetrated each aspect of human's life and has changed it completely. Our world is digitalized via the Internet. It gives a new breath for modern commerce helping those companies to find more customers and to reach them faster. Internet put the business on a new level which is called 'digitalization'. According to Professor Klaus Schwab, this process is called Fourth Industrial Revolution, meaning the current environment in which such new trends as the Internet of things, virtual reality, robotics and artificial intelligence are changing the way people live and work.

Why digitalization is good for business future? Because of decentralization, access to a clearly understandable information without any restrictions, and it is provided with automated customer support. Digitalization is a digital technologies usage everywhere: trading, customer service, government, communication, manufacturing, and daily life. High technologies by themselves are not a product yet (European Commission, 2018). However, the basis of the digital economy is manufacturing with the usage of new digital technologies, which allow producing high-quality products according to customer's expectations in the shortest possible time. Digitalized business systems do not need

human involvement to take part in a decision process as them make it automatically. Such systems collect data, direct, and coordinate it to the supporting business actions.

In a few words, digitalization is a transformation and technologies are the tools through which it will occur. Companies which have already made digital transformation of their operations and customer interface are defined as future-ready. In a study of digital transformation prepared by The Massachusetts Institute of Technology Center for Information Systems Research management found that margins of such future-ready firms are higher than the industry average. It is considered the transformation process is not a simple process, but necessary and worthwhile.

Full digitalization contributes to the advancement of artificial intelligence, which in case leads to changes of future works. Hybrid world where human beings and artificial intelligence live side by side is inevitable and triggered for people. However, the traditional education system does not prepare young generation for the upcoming hybrid age, but it prepares them for jobs which are no longer existed. AI is increasingly raising the possibility of automation in high-skilled professions. Thanks to artificial intelligence, robotics and bots most of currently stable job profiles will be changed.

Internet of Things generates intelligent maintenance schemes, applications for automation and novel sensor technologies. New business models need digital solutions for business development. Artificial intelligence is getting everywhere: social media interactions, home, car,

school and medicine. These are challenges society is going to face up in near future and people still are ill-prepared for it. Automation systems are improved by communication speed and reliability and trade-off between clouds and edge computing. The need for optimization is increased as well as machine learning for feedback control. Common computing platforms and global data will liquidate the separation between functions in the automation hierarchy with open standards.

The future is for those companies which integrate new technologies in their products to find the special way to interact with the user (Randall et al., 2018) Gathering and analyzing data from social media profile or web shops where users order goods, or their browser searching history make companies possible to use marketing tools based on one's needs and preferences. Apple face recognition system is a good example of gathering information about users' needs by smartphone which is always close to them and then using the data in marketing technologies. Maybe some people will say such technologies do not leave a chance for freedom of choice or they can say "I did not allow anyone to get my personal data and use it in commercial or other purpose". The truth it, if someone uses any device or use a social network to communicate with others, this automatically means that he or she has agreed. But if you do not agree, just stop using everything, but be aware it is too late, computers have already had a file on you.

The Nordic countries is a big perspective market for e-commerce, although they are not the obvious target market for e-commerce expansion plans, mostly because of the language issue. The Nordic countries have distinct languages only spoken within the region. There are many differences between the Nordic countries which have to be learnt, analyzed and adapted to each offers, delivery options and marketing strategies or payment methods to make it based on consumer needs. The population density and smaller distances enable delivery logistics which suit customers seeking perishable goods. Scandinavia buying groceries online is a strongly growing segment which offer opportunities to retailers for e-commerce to boost the business. Nordic consumers are good at adapting to technology and innovations, which makes the country an excellent test market for new initiatives.

## 2 Methodology

The research is based on the statistical approach (in order to get known why people in Nordic countries shop online). The elements of the comparative

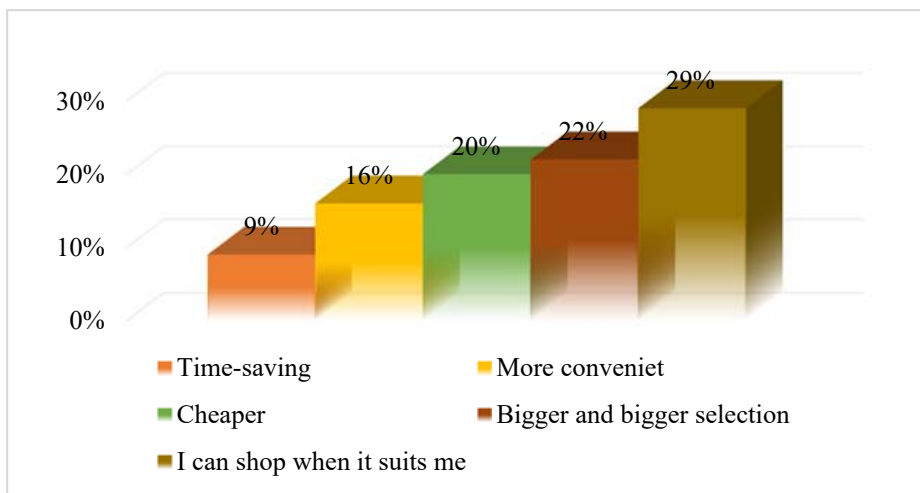
analysis were applied to find out certain specific details in functioning of e-commerce in different Scandinavian countries. Generalization method was used to specify the details of e-commerce in all Scandinavian countries.

## 3 Results

Global ecommerce is growing rapidly and globally. The experts predict a bright future to Ecommerce. Ecommerce expert Gary Hoover's research estimate that by 2022 ecommerce revenues will exceed \$638 billion in the U.S. alone. Globally, they show that retail sales may exceed \$4.058 trillion by as soon as 2020. Shoppers spend 36% of their budget online on average (Ecommerce, 2018). U.S. Department of Commerce data shows that ecommerce sales currently average about of total retail sales, what means that brands still have an opportunity to launch an ecommerce and make the business grow. It is also good for small business, the cost for entry is low and they reach more customers and sell their products directly to them. In the International Journal of Market Research, M. Nick Hajili wrote: "Trust, encouraged by social media, significantly affects intention to buy. Therefore, trust has a significant role in ecommerce by directly influencing intention to buy and indirectly influencing perceived usefulness."

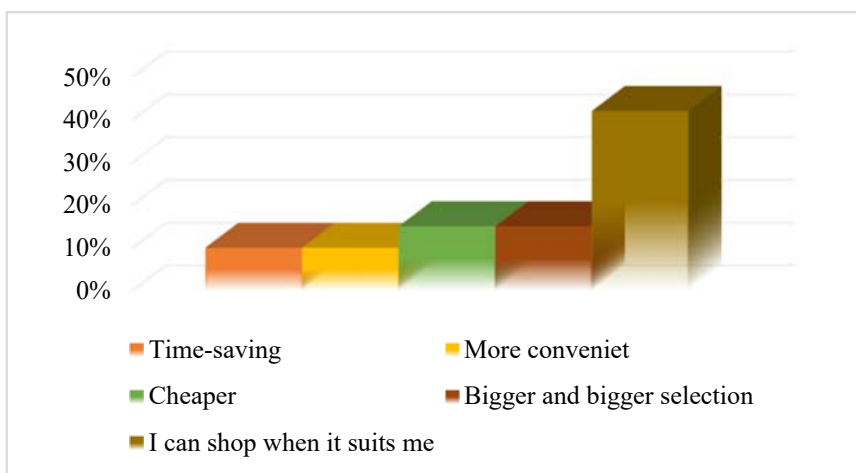
More and more customers worldwide give their preferences to online shopping, because it is convenient, it is possible to purchase goods in a few clicks from everywhere where is the internet is, it is time saved, it is cheaper, it gives more options to choose, the delivery is fast. As Charlotte Howard (the New York bureau chief and energy and commodities editor) was the consumer goods and retail correspondent, covering e-commerce, traditional retail and consumer companies around the world during 2015–2018 said "E-commerce is transforming business and daily life, mostly for the better". As is written in her special report for The Economist, "over the past decade global e-commerce has been expanding at an average rate of 20% a year as bricks-and-mortar shops have languished. Yet its share of total retail trade last (2016) year, at 8.5% worldwide, was still modest" (The Economist, 2017).

Online sales in the Nordics increased by 11% to 10 billion euros in the first six months of 2018 compared with the same period in 2017 according to PostNord (the Nordic region logistic company) report "E-commerce in the Nordics 2018". In the last 2 years PostNord has been studied the e-commerce tendency in the Nordics. During 1 year they make 48 consumer



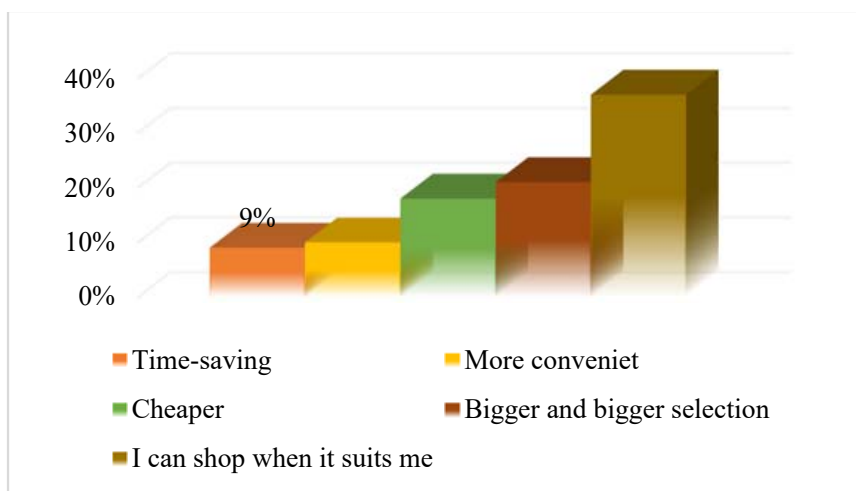
**Figure 1** Why Swedes shope online

Source: Ecommerce News (2018)



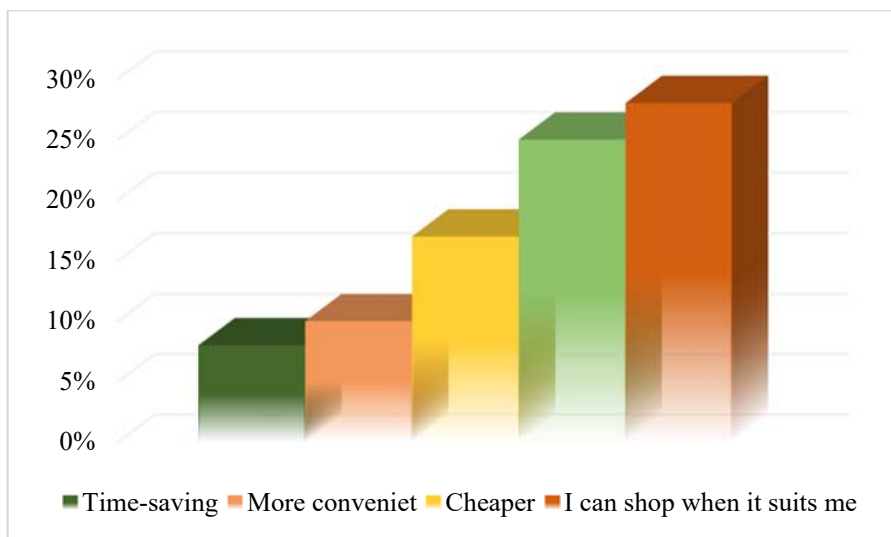
**Figure 2** Why Danes shop online

Source: Ecommerce News (2018)



**Figure 3** Why Norwegians shop online

Source: Ecommerce News (2018)



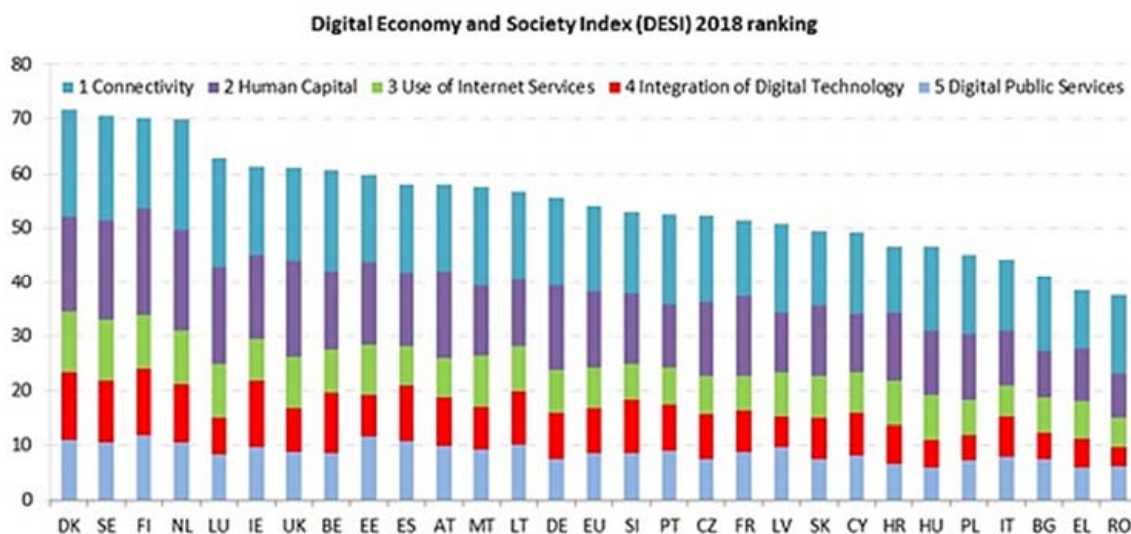
**Figure 4** Why Finns shop online

Source: Ecommerce News (2018)

surveys, 12 per Sweden, Norway, Denmark and Finlandia. In those reports they concentrate on how much Scandinavians have purchased online, both in total and from foreign webshops.

Those figures below are based on consumer surveys carried out monthly in Sweden, Denmark, Norway and Finland from February 2017 through January 2018 via the TNS SIFO online panel on 12 different occasions are demonstrated the 5 top reasons why the Nordic people shop online. A representative selection of the national population aged 18–79 years in each country. The total number of respondents is 92,656. In all, 19,186 respondents took part in Sweden, 21,293 in Denmark, 21,766 in Norway and 30,411 in Finland.

People in Nordic countries shop from abroad and their consumption from abroad amounted to 4.3 billion euros. Sweden has a high rate of e-commerce and the largest population, which resulted in the most e-commerce sales in the Nordic region with EUR 8.7 billion. It is the largest market in the Nordics for B2C e-commerce revenue. Denmark showed the highest value with 229 euros per online shopper each month. Finns consumers shop less, what is connected with their conservative view on online payments. Finns have excellent growth potential when it comes to e-commerce moving forward, but the rate of e-commerce lower than in other Nordic countries, because direct transfer from a bank account is



**Figure 5** Digital Economy and Society Index (DESI) 2018 ranking

Source: European Commission (2018)

### Nordics Lead Digital World

Northern European nations and Switzerland are the most advanced digital economies

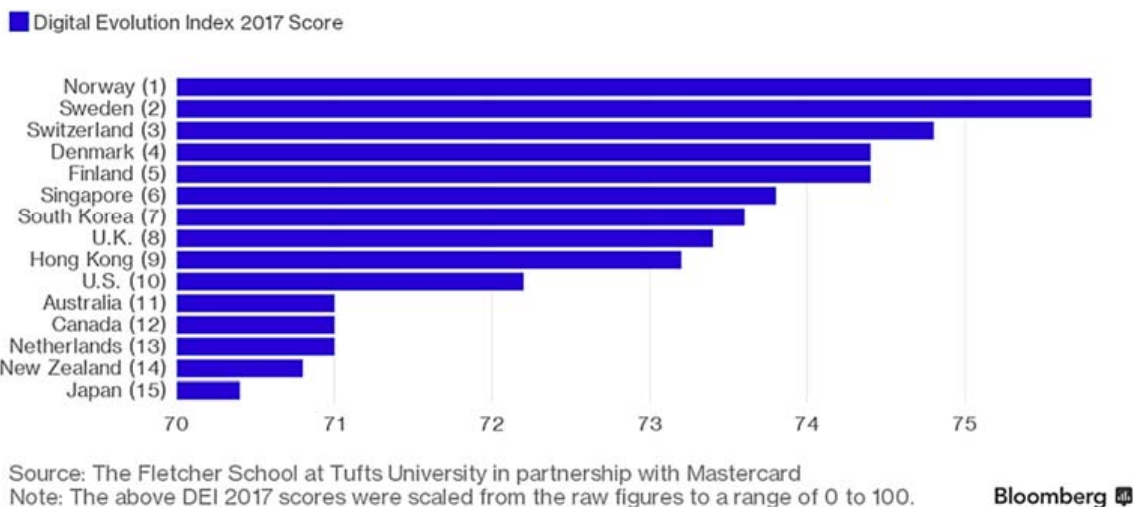


Figure 6 Nordics Lead Digital World

Source: The Fletcher School (2017)

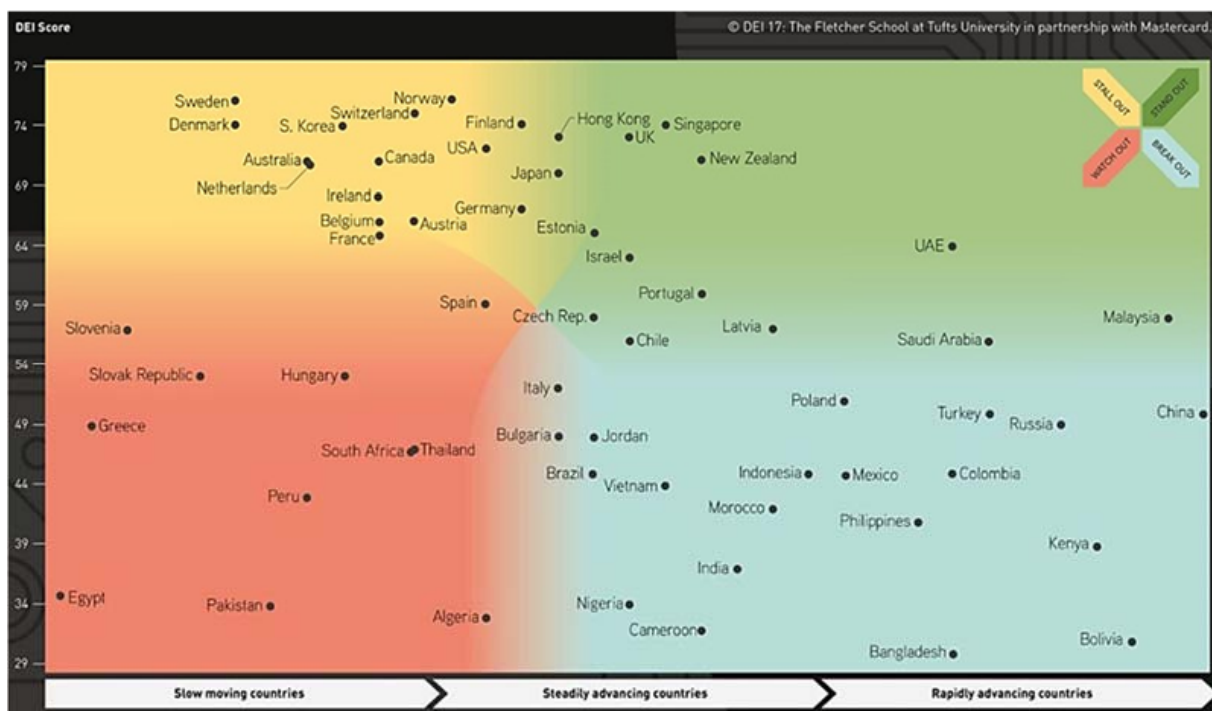


Figure 7 Rate of Digital Revolution

Source: The Fletcher School (2017)

the most popular method for them to pay for the goods.

People mostly buy fashion items, media and home electronics through the Internet and the Nordic countries are not in exception. The strong domestic market provides enough choice and value to satisfy consumers. Consumers have high demands, both for the websites they shop from

and for deliveries. Customers want to be able to guide when the product is coming and how it will be delivered. Delivery on weekdays are going to be on demand as well, because this is a solution to make lives more simplify and comfortable. For instant, Norway is not a part of the EU, the major challenge for e-retailers who sell in Norway is returns. Customers have to wait too long for the

money until purchases cross the border and get back to the e-retailers.

The favorite destinations for international e-commerce between the Nordic countries are China, the UK, Germany and the US. E-commerce from China has grown in all Nordic countries, the purchase sums for products from China are, however, lower than the purchase sums for products from Europe and the US. Such marketplaces like Amazon are going to grow in popularity. In Denmark wupti.com has already taken a step in that direction. From the beginning wupti.com sold their own products, but now they are welcome for other retailers. This is a good step toward global competition.

Ecommerce in the Nordic region has increased by 11 percent during the first six months of 2018, compared with the same period previous year. Nordic consumers made online purchases worth 10 billion euros. The largest ecommerce country in the region is Sweden, with 4.12 billion euros. For the retailers is it also an easier way to find their consumers faster using social media platforms and then personalize offers according to shopping habits of potential client. Now people used to and need to make shopping anytime and anywhere, the list of customers' requirements and expectations has become longer. For now the Nordic e-commerce level is still low and the number of Nordic retailers in some areas are lower than others. The Nordic region has a large improvement potential in e-commerce, but there are also some challenges the retailers should meet with. Customers need in convenience, functionality, fast delivery, free returns, availability and general satisfaction of the buying process.

In digital era we are living in the Internet penetration worldwide and e-commerce is an expending trend. The future is for e-commerce and delivery. Consumers expectations are high. Consumers prefer not to spend their days especially the weekends in physical shopping centres. E-commerce is a good chance for business to sell goods for distance and do not worry about time running a business online. E-commerce is a good example of simplification for the few reasons: to make shopping is enough to have cell phone access with the internet; large offering; prices are cheap; freedom of choice; it is time saved; it is convenience what is probably the most significant benefit of shopping online and secure. Shops online take all needed measures to guarantee those customers the secure transactions and payments with the help of SSL certification, protection against DoS/DDoS attacks. As it has advantages there are disadvantages as well. E-commerce is

about selling and buy products online, without face-to-face communication, without possibility to try, touch or taste the product. There is still need in direct conversation with consultant or customer based the opinion on reviews and take some risk to stay unsatisfied and learn the return policy. The another problem which can appear is a technology breakdown: slow website, bad interface, weak functional lead to unwilling to take an attempt finish the transaction.

The European Commission annually evaluates member states' progress in the integration of digital technology in a ranking called the Digital Economy and Society Index (DESI). The Nordic EU-countries DESI index for 2018 clearly shows that Denmark is the top achiever in all five the categories of the index: connectivity, human capital, use of internet, integration of digital technology and digital public services. The Nordics (Denmark, Sweden, Finland) are all consistently top performers, what means those countries have advanced digital economy.

A study by The Fletcher School at Tuft's University listed in the Digital Evolution Index 2017 demonstrated five most advanced digital economies in the world to be the Nordic countries: Norway, Sweden, Switzerland, Denmark and Finland. Nonetheless, top five countries show a low rate of digital evolution. Nordics country are in the "stall out zone", as it shown below.

#### 4 Conclusion

Digitalization influences on social, economic and environmental aspects. To make digital infrastructure should be considered the importance to ensure the equal access to digital technologies, in first turn, to the Internet. Equal access means the absence of barriers such as age, socio-economic status or lack of digital skills to engage with digital technologies.

Digital technologies make cities "smarter" and improve the quality of life. Smart city solutions as adopters of sound information and communication technology have been already implemented in Nordic regions. All Nordic countries have adopted digital agendas or strategies at the national level. In Table 1 below are presented overview of these policies, national priorities and regional policy development.

Digitalisation and automation in the Nordic manufacturing sector is one of the main tools for sustainable Nordic regional development. Nordic digitalisation and automation represent a huge opportunity for a better manufacturing situation. It is not an easy step for companies toward digitalisation and automation. There are advanced

and innovative small group companies that bring and adopt the digital solutions of tomorrow. Some other companies take over from the first group and start to develop new digital business models. And the third group of companies just follow the previous two, investing in new technologies when they become more mature. But all of the companies meet their own challenges and barriers they should

go through the aim to be future-ready. To sum up, Nordic regions are world leaders when it comes to digitalization. To keep the leading positions they need to put more effort into innovation, cause adoption of digital technology and infrastructure is not enough. They spend money on research and development. They have strong infrastructure sector which value is high in the Nordics.

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