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Digital transformation in North Sea pilot regions

Insights from the Interreg VB COM^3 project

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Contents

1. Introduction

Within the Interreg North Sea Region (NSR) project COM^3, the adoption of digital technologies by businesses in the participating regions stands central. To evaluate the situation and circumstances in the different participating regions, research was conducted in the form of a survey and in-depth interviews with key stakeholders. This report presents the findings and shall support the understanding between local and regional stakeholders as well as the development of responses addressing the identified challenges.

Pilot region	Country
Leiedal	Belgium
Vejle	Denmark
Lincolnshire	England
Hüttener Berge	Germany
Drenthe	Netherlands
Oldambt	Netherlands
Oldambt	Netherlands
Rogaland	Norway
Vinje	Norway
Torsby	Sweden

Table 1: Overview participating pilot regions

The structure of this report looks as follows: First, we introduce the applied methodology. Then, the results of the survey and the in-depth interviews are presented. Whenever meaningful, to each chapter a table with the key findings is added in the beginning. In the last two chapters, we list the main challenges identified in the pilot regions regarding the digital transformation of businesses and close with some final remarks.

2. Methodology

To facilitate the exchange of experience and knowledge among the COM^3 project partners and beyond, we first developed a survey to get an initial overview of the situation in the pilot regions. This survey covered questions about the economic situation, the internet connectivity and uptake, digital literacy training available and measures of the public sector to foster digital developments. Thereby, a mix of closed and open questions was applied.

As a follow-up, the results of the survey were screened and the remaining questions were formulated by the project partners responsible for developing the training material within the COM^3 project. The main subtopics hereby were questions about the development stage and support possibilities in the participating regions, regulatory support and financing schemes, questions about the development of the pilot activities, outcomes of the exchange with businesses in the region, effects of the covid-19 crisis, questions about cybersecurity and hub training. The developed questionnaire resulted in eight in-depth online interviews of one to two hours with one to two persons from the pilot regions in Belgium, Denmark, England, Germany, Netherlands and Norway. Subsequently, the recorded interviews were transcribed.

Important to mention is that the surveys were collected at the beginning of the covid-19 pandemic (February to May 2020) and the in-depth interviews took place in February and March 2021.

In the next two chapters, we present the results gained from each approach.

3. Survey results

3.1. Overview of regional economics

- The share of the IT sector in the pilot regions was around 2 to 7 % (but not necessarily all businesses were included as the distinction proved challenging or statistics were not available)
- Most of the survey participants indicated that the local economic performance improved over the last 5 years, one saw it rather stagnating
- The unemployment numbers laid between 1 and 5%, but one participant already indicated that the covid-19 crisis should have an impact on that
- The share of SMEs in the partner regions was mostly >90% and in one region, a share of 31-50% was estimated
- The share of self-employed varied: some were between 5 and 20%, some higher or even >40%
- When asking about sectors dominating the local economy, diverse sectors were named, reoccurring ones were: agriculture/ food-related, (e.g. processing or catering, aquaculture), tourism and crafts/arts, health sector (care and life sciences), manufacturing/construction (several times in general 'industry', engineering and textile sector named here), furthermore

the following service level activities were named: trade, business services, retail. Regional specialisations like petroleum, wind power, defence, hydropower and two times logistic sector were added

3.2. Internet connectivity and adoption

When asking about the internet connectivity and more specifically about NGA (Next Generation Access) coverage, some frontrunners were to be identified where the NGA coverage was >98% of the households. A few survey participants indicated some white or grey spots in the area.

Regarding the uptake of NGA by businesses, it was shown that there can often no differentiation be made regarding private households and businesses. Some mentioned that a part of the businesses was still waiting for an improvement of the available connectivity and one participant mentioned that the coverage is expected to be 100% NGA by the end of 2020.

Moreover, it was asked whether there are any sectors identified which are rather laggards regarding NGA adoption. Some partners responded that they do not have information on that available or stated that this is not a problem. However, a few participants noted that agricultural/ craft businesses showed to rather be laggards, e.g. not using the possibilities given for online marketing or changing business processes. Once it was noticed as well that smaller businesses in rural areas and traditional sectors such as agri-food tended to have lower uptake levels. Another survey participant added that the food and construction sector was less likely to take up NGA and that probably the size of the company / the place in the value chain played a role as well. Due to delays in broadband development, one participant noted that the transport sector in the respective region considered relocation, furthermore also the tourism and agriculture sector was impacted by these delays.

3.3. Promotion of NGA adoption

Institutions supporting the NGA uptake by businesses (and partly also by citizens) in the regions were the following: twice broadband initiatives and once a broadband competence centre were named, the telecommunication companies, but also regional authority, municipality, civic organisations, adult education centres, and open network initiatives by private parties were listed. Once it was additionally mentioned that the regional and federal government aimed at promoting NGA uptake, but that no consensus was found among the stakeholders yet on how to approach this together.

A range of activities by the beforehand mentioned support organisations were listed: fostering NGA deployment/ promoting the roll-out, offering training/ workshops and seminars, giving (financial) advice, creating general awareness, and administrative support of the municipalities.

Additionally, it was asked whether there was any online support given as well. Here, two mentioned the tech support by telecommunication companies, so rather private providers offering support for

companies and professionals in that regard. Moreover, public online services were partly available as well. Once, the broadband information centre offered online services, Digi-points with computer assistants were named and one participant wrote that several services were available, for example business support systems.

3.4. Digital literacy training

When asking about institutions in the area covering digital literacy training especially for businesses/ employees, two mentioned an initiative in place or were working on that for the whole region (with educational and business support partners). One participant wrote to offer courses for entrepreneurs (through business support, e.g. also by providing start-up environments) and one referred to the chamber of commerce for digital literacy training. One survey participant still mentioned the federal government fostering citizens and companies to communicate digitally with public services and another one wrote having several institutions in the region offering courses, consultancy and research.

Accordingly, several funding possibilities were mentioned, depending on the institutions working on it: privately/ by businesses themselves, public/ EU funding, municipality, regional authority and national government were listed.

We also asked how far these support mechanisms were used in the way it was expected. No clear answer was given regarding that, as it was either not known, not done yet or not observed as being a problem. Moreover, it was added that in one region, the fragmentation of government bodies was generally observed as a problem, leading to a loss of time, budget, misunderstanding and incompatibility.

3.5. Regional/ local digital agenda

We were also interested in whether there is a local/ regional digital agenda in place. Two mentioned being currently working on it. Two other participants explained to rather act straightforwardly: they had the goal/ focus to foster digitalisation in the region but no specific action plan in place. One participant was mainly focusing on providing NGA for a fair price and increasing the collaboration. In one region, there was no agenda yet, but the plan existed to still make one. In another survey response, it was elaborated that the digital agenda consisted of the provision of similar services to all municipalities and the focus on different strategy levels such as a web platform etc. Finally, for one region, it was indicated that a digital agenda was of relevance already some years ago and that in the meantime, the region can be seen as already well developed, making a digital agenda redundant.

3.6. Room for improvement regarding NGA adoption and digital literacy training

When asking where the survey participants would like to see improvements in the region regarding both, NGA connectivity/ adoption and digital literacy training, we received the following answers regarding connectivity:

- improve connectivity to achieve 100% NGA coverage
- further focus on the deployment of NGA due to commercial parties working against each other
- rolling out open networks

Regarding digital literacy:

- seen as a big challenge to foster it in order to also draw advantages of digital tools and possibilities
- bringing together fragmented initiatives
- similar to above: connecting and broadening existing initiatives
- working on an action plan to improve digitalisation in the municipality and aiming for a growth and development strategy

4. In-depth interviews

4.1. Regional overview

4.1.1. Level of digitalisation among businesses in the regions

Key findings/ messages

→ Mixed impressions found in the pilot regions regarding the average level of digitalisation among businesses

→ Remarkable differences between businesses in a region to be observed (e.g. depending on size and business model)

→ Level of digitalisation was also brought in relation with the state of the digital infrastructure

Figure 1: Key findings/ messages for this chapter

Several interviewees saw their region compared to others in an advanced position. Once it was explained that this is the case because of a high degree of broadband connectivity and the digital agenda in place. It was added that the participation in the Interreg NSR project CORA gave a push towards political digitalisation support and it was suggested that financial support/ investments are crucial in that process. According to the interview, subsequently, this also fostered digital competencies in the area, resulting in more public e-services offered for citizens as well (e.g. local tax matters, building applications, citizen participation). Another interviewee explained that the usage of digital tools is widely spread and glass fibre is accessible for almost everyone who would like to connect, also in more remote places in the region. A high utilisation rate is also found among schools and companies. As many companies are operating business to business in that region, it was added that the businesses are extra conscious of presenting themselves as professionals, which can be supported by the adoption of digital solutions.

A few times, it was explained that there are differences regarding the adoption within the region. One municipal association interviewed consists of 13 municipalities, also smaller ones, so it was suggested that differences are to be observed among these. The general impression was that digitalisation in the region is on a good level as it is also a very populated area with a lot of companies. Furthermore, the influence of being a transit country is observed and historical events were discussed fostering the ability to be adaptive (e.g. maker industry). The businesses in the region weren't necessarily seen as frontrunners but being good at adapting to the situation, which was also shown during the covid-19 crisis in which some companies made the transition, e.g. dealing with data internally and externally. It was also argued that some more rural areas in the smaller municipalities might need some extra support to keep their businesses in place. Another interviewee had the impression that the region has overall a good digital infrastructure in place (glass fibre internet connectivity for most businesses in place or at least available). Yet, when looking at digital adoption, some businesses were rather seen as laggards, especially really small companies, and it was suggested that some of these are probably also not too dependent on digital technologies. For one region it was explained that the region is rather underdeveloped regarding IT and digitalisation in official statistics and reports, however, the interviewee had a different impression regarding the municipality as a cluster of different IT companies has formed there over the last years. It was added that startups being innovative related to digital technology are to be found in the municipality. However, it was argued that these cannot really be seen as frontrunners, as they rather try to keep up with newly developing trends.

Three times, it was estimated that the adoption of digital technology is rather lagging in the respective region. Once it was noted, however, that within the region, quite some differences are to be observed. Some bigger companies are found to be pretty advanced in using digital technology (e.g. aeroplane building company and a big insurance company), while SMEs are rather lagging behind in the adoption of digital solutions. Another region explained that a good digital environment is still missing and it was claimed that most of the retail sector does not know how to use digital technology on the right level and that in this regard, mainly the organisation of the logistics is seen

as a bottleneck (online in combination with offline sales, e.g. keeping track of stock). Furthermore, it was added that respective businesses have already a lot to deal with daily, so the future orientation comes rather short. However, it was also argued that some factories located in the region are quite advanced in integrating digital technologies. One interviewee suggested that while it is difficult to measure it directly, a low productivity level indicates that digital adoption is also less in the region. Moreover, a high share of microbusinesses can be found there, which are less likely to take up broadband due to a lack of human resources compared to bigger companies (no IT department or expert working on it). Next to that, it was mentioned that there are also some sectors located which are technologically advanced, e.g. defence sector and engineering.

4.1.2. Digital technologies/tools used by businesses

Key findings/ messages

→ Among and within regions remarkable differences when asking to what extent digital technologies are adopted by businesses of a region

→ It depends on the degree of digital adoption one refers to, e.g. having a website or the usage of digital data (the more advanced the adoption level, the higher the chance of an adoption gap among businesses)

→ Smaller retail businesses are rather seen as laggards in that respect, but not to be generalized

Figure 2: Key findings/ messages for this chapter

Striking differences were to be noticed discussing the kind of digital technologies/ tools used by businesses in the pilot regions. Two interviewees found the businesses in their region comparably well adapting: Various services were named which are mainly offered digitally/ online, also in remote areas, e.g. tickets for alpine resort or more generally the national payment system which is very established (used by all banks and 80% of citizens). Furthermore, some examples from student startups of the university were named which are related to digital solutions, for example offering an application for online stock market trading or a robot answering calls. So in general, it is seen as advanced.

Some of the other regions noted as well that there is in some respect quite some progress made already: With one pilot region it was discussed that due to the economic landscape in the region, which is manufacturing and trade-focused, it is suggested that the high competition urges to be cost-effective. Therefore, digital tools are applied which are supporting their interests (e.g. marketing and storage system related). Moreover, the fear of big players such as Amazon among businesses was

mentioned, which also triggers businesses to look into various software possibilities and automatization of business processes to be cost-effective. Most companies are found to have at least a website, but the interviewee argued that a very good internet connectivity level in place boosts the digital adoption of companies as well. Next to that, startups are active in the municipality, focusing on industry 4.0 (automatization, recognition, AI etc), and also IoT and similar are promoted. Another interviewee found businesses well adopted regarding digitising internal processes and noted that they make mainly usage of cloud services and also online marketing. Websites/ social media are also a standard among businesses, although there may be a difference in usage. On the other hand, it was added that the interviewed businesses weren't showing much progress/understanding regarding the usage of digital data. One interviewee explained that digital transformation already took place in many aspects of the industry, e.g. (sale) tools and webshops, and it was argued that this is especially needed among bigger companies to manage their stocks, distribution etc. In the retail sector, it was noticed that some needed to make a shift during the covid 19 crisis, but that the (regional) IT sector took its chance. Some, especially bigger companies active in several countries, can be seen as frontrunners as they are also making use of platforms. At the moment of the interview, it was experienced that the retail sector is struggling in general, claiming that it depends also on the age of the CEO or business owner whether the switch to new technologies is easily made. However, it was also noted that it depends on the added value they want to create, as sometimes doing business online is also not suiting the (selling) concept. Therefore rather big vs. small retail (smaller ones struggling while bigger ones sell a lot), although some were observed to make an opportunity out of the crisis by increasing their level of digitalisation. Moreover, the government launched calls to fund e.g. innovation using data, but it was observed that also mainly bigger companies apply and it was argued that an expert doing it on their behalf is expensive to hire, so smaller companies are often missing out. In another region, where a lot of agricultural businesses are to be found, it was discussed that this is also a sector with a lot of technical innovation happening during the recent years (e.g. also triggered due to Brexit, like robots picking strawberries). Nevertheless, it was added that it is hard to generalize, the impression persisted that more and more businesses are interested in digital transformation, but it is often not really clear to them how to do it and what is needed. The businesses participating in the COM^3 project from that region have mostly websites in place, although these may be rather simplistic, and many businesses are also active on social media, even if that is probably limited by time resources. Furthermore, the general impression was that they are aware of the adoption gap and what could be done with digital technology.

Two regions were rather pessimistic regarding the adoption of digital technologies/ tools. One explained that in the project, it was experienced that most of the farmers or local small businesses don't have things like a very detailed website or online shop/ online marketplace. The other spoke about how businesses working business to business tend to stick to old habits as long as it is still working and that they don't make so much use of digital solutions. One of the reasons suggested was that they might also not have the amount of staff to grasp opportunities to reach a bigger market. The future aspect was found to be underestimated, for example regarding global competition at a local level and possibilities to diversify.

4.1.3. Crucial stakeholders

Key findings/ messages

→ Business support initiatives were named as key stakeholders also supporting businesses in their digital transformation processes

→ Some other public and private organisations were listed

Figure 3: Key findings/ messages for this chapter

Talking about crucial stakeholders in the pilot regions for digitalisation support of businesses and general efforts to bring businesses together, the following were named:

- The county district with its economic development agency provides help and service for regional companies and also assists with digital transformation. Currently, they are mainly focused on the lack of qualified workers in the region, e.g. engineers. This organisation also provides networking events
- The regional authority offers a business support programme, which is the main organisation supporting SMEs with a variety of subjects such as digitalisation. It is also their task to bring entrepreneurs together, they are hosting events on different subjects and during the crisis also online events were offered
- The employers association was named and the respective sectors as well as the broadband providers. The organisation of (networking) events was discussed and that it was more difficult during the crisis as some people were also not used to online gatherings and networking, furthermore to offer demonstrations was more challenging online and it was added that the 'usual suspects' show up during such events
- Many stakeholders involved, for example a research collaboration for industrial asset management is in place, working together with the chambers of commerce and most companies of the region are members of these. Furthermore, there are organisations offering incubators and places for startups
- The chamber of commerce, county council and the business support were listed, also regarding funding (channelled from national government). Underneath the county council, there are the district councils, these were described as being more connected locally to the business community. The local college gives training courses and supports businesses to upskill people also in digital technology. Furthermore, the university was seen as an important stakeholder, delivering innovation support, having various facilities available and also offering events, for example by the business school organising networking events or engineering breakfast (sector-specific groupings)

- There is a chamber of commerce in each town, these form also partners of the municipality and try to bring businesses together. It was experienced that they fasten digitalisation to a certain extent, but that it is also a challenge to engage businesses from all sectors. The region is very much dominated by the travel/ tourism industry, common marketing is organised via portals where actors also have their websites and it is suggested that this is one of the main support structures (online marketing)
- The national business promotion was named, which is also responsible for the national strategies. On a regional basis, there are business houses as a public initiative, on the local level private initiatives like business unions and the municipality as stakeholders. Additionally, there is a national digitalisation/IT platform with gathered information (e.g. also regarding funding), on which business activities can be added supporting the national strategy. In that specific municipality, the focus lays on AI, supercomputers (providing also supercomputing resources to businesses) and cybersecurity. Thus, they also lay focus on digitalisation, the possible usage of data by businesses is a topic as well. The university was still mentioned as a stakeholder regarding educating the students and indirectly providing knowledge to the companies. There are local conferences organised to bring businesses together, often also branch-related but more general ones are offered by the municipality
- Governmental initiatives and three intermediary organisations were named representing the interest of businesses- the chamber of commerce, the union of self-employed and one business organisation active on different levels (national and regional) representing all kinds of sectors and markets working with member subscriptions. They offer a digital programme (digital academy) to support companies in showing where they stand regarding digitalisation efforts (maturity check and support) and also the union of self-employed is mentioned to offer something similar with an initiative called Digicoach. The chamber of commerce also thematizes digitalisation, companies get supported by this organisation if wanted. In general, all three offer events and for example also online coaching

4.1.4. Public support measures

Key findings/ messages

→ Focus on the provision of suitable infrastructure named as a public support measure

→ Several times public funding mechanisms were mentioned, but also other public initiatives beyond financial support were listed as well

Figure 4: Key findings/ messages for this chapter

Various public support measures to (indirectly) support digitalisation efforts were named, not limited to financial support. In one municipality, it is focused on supporting glass fibre developments to provide each company with the possibility to make use of it. It was added that participation in the

CORA project was helpful to bring the topic of digitalisation into the minds of the stakeholders. Another interviewee mentioned as well that the rollout of the internet infrastructure, including 5G, is part of the support. Next to that, within the country, the support on national, regional and municipality levels is aligned with the national strategy and competitiveness is put central in that as export plays an important role. Moreover, it was added that business development centres provide important direct support for companies. Another interviewee stated that one of the municipalities in the region is part of a smart city project, for which a department was created to promote efforts and initiatives in that regard. Hence, in that aspect, the public services are quite advanced and it was argued that it also creates spinoff effects for businesses and that also new services for citizens are provided. One interviewee explained that the county council offers for example a digital health check tool for businesses, next to providing funding and giving advice. The district councils have economic development offices and also administer grants. Furthermore, they run business centres and one also has community broadband hubs in place. Another district council has a community broadband officer supporting villages to connect to broadband (rather community-based), and the broader agenda focusing on some key sectors. In one pilot region, public support is provided through the regional business support programme, one expert on digitalisation matters is employed for that and helps SMEs for example with 'emergency digitalisation', as it is called, to get very quickly up to speed with the basics (e.g. making own website or data management). Next to that, different subsidies are available by subsidy providers on the national or regional level, e.g. on innovation, software development etc. Similarly, one interviewee explained that the pilot region launches calls for businesses to receive funding for digitalisation projects. There is also an initiative in place promoting the digitalisation of the government itself. Furthermore, it was mentioned that an initiative regarding digital inclusion was newly launched in the region to make sure all children have access to hardware and internet access (related to the covid-19 crisis). Additionally, it was stated that digitalisation plays an important part in public sector funding and stimulating innovation. One interviewee explained that locally, at least financial support is provided for common tourism portals (municipality is co-financing with chambers of commerce and businesses). Furthermore, there are regional and national support measures in place for companies. These also organise courses for instance about social media. The national support organisation is targeting some businesses to work closely together, e.g. helping with projects or business models and offer start-up support, but is not specifically focused on digitalisation efforts. Moreover, a national service exists which functions as an information/advice service for companies interested in digital technology (rather for more advanced players). Last but not least, one interviewee noted that there is financial stimulus that can be used to boost innovation. Further, some support is provided by the employers association, the province and European level as well as funds from the ministry. However, it was also argued that mostly, the usual suspects make use of these, arguing that contacts play a key role in that. Thus, it is more likely that big companies profit as they also have rather the possibility to make usage of (external) staff to acquire public support.

Figure 5: Some public support projects mentioned by the regions

4.1.5. Sector-specific relations

Key findings/ messages

→ No clear sector-specific differences were to be identified

→ Rather regional focus on key sectors to take into account

Figure 6: Key findings/ messages for this chapter

The pilot regions were also asked if there are any sector-specific differences to be noticed. One interviewee explained that there, the tourism sector is comparably easier to be engaged in public measures. Two other pilot regions reported the focus on key sectors- in one municipality the focus lays on food innovation, food supply chain and everything related to food as there are many food companies to be found. Furthermore, many manufacturing businesses are located in the region. AI is also announced as a focus (still under development), and the aim is to make a cluster/ attract companies for that. Another interviewee listed six key sectors the county council identified- agrifood, health and care, manufacturing and engineering, net-zero/low carbon, defence and tourism. By participating in the COM^3 project it is hoped to provide more digital support for the tourism sector

so they find themselves able to better promote themselves (e.g. accommodation) and to create a brand for the region.

On the other hand, it was also discussed with an interviewee that the interest seems to be the same across all sectors when talking about public digitalisation support, while the regional government still focuses on a couple of sectors (agricultural business, green chemistry, circular economy, energy, digitalisation, high-tech systems and materials, health economy, leisure/ tourism and logistics). It was rather argued that for the application for subsidies, a certain size of the business is needed, as applying is not always that easy and also one first needs to know how to find such offers (it was estimated that very small companies with up to 5 employees do not apply regularly). Yet, it was added that the business support programme of the region can assist or the regional government itself if they are the provider of the subsidy. Similarly, another interviewee claimed that there is not necessarily a difference among sectors, but that rather bigger companies, as well as local authorities, are joining the calls, as they have the available human resources to do so (creating proposals etc). It was also argued that money is to be invested first before it is actually possible to get money through public programmes, resulting in smaller ones dropping out and rather looking for something which delivers benefit as soon as possible (short-term thinking). Therefore, regional governments try to stimulate the smaller ones as well, initiatives are started for them like workshops/ providing practical insights regarding digitalisation, which should deliver benefits more directly. One region also pointed out that some businesses do not find the time/do not have the staff for making the transition, either due to more urgent problems to be addressed or a lack of awareness of already available solutions on the market. Once, there persisted the impression that most of the businesses are interested and that the collaboration between companies is quite well developed. Various activities/ events are organised, also through the chambers of commerce. One interviewed region had no information regarding that available, as the businesses rather communicate with the business development agency or chamber of commerce when they experience any problems instead of approaching the municipality. As such information is not specifically forwarded to the municipality, it was stated that they rather get to know about such issues informally, e.g. at the village council.

4.1.6. Public vs. private offers

Key findings/ messages

→ Whether public or private solutions are used by businesses depends on the kind of support they wish for

→ Bigger companies are rather found to have resources for external experts and similar

Figure 7: Key findings/ messages for this chapter

Several times, it was noted that it is important to make a differentiation which kind of digitalisation support one is talking about. In one case, there is a private innovation support organisation in place, aiming at getting a complete overview of all businesses in the region, which overlaps with the initiative of the regional authority. The IT hub created for the same region has also private partners involved and it was set up as a shortage of people was noticed in the region with the specific educational background looked for by larger companies, so these companies urged for creating more knowledge to be able to stay in the area (especially regarding IT skills). In contrast, the example was given that when a business is interested in having a website, it is purely market regulated. One interviewee summarized it as follows: As direct support by the government is not possible for private businesses, private solutions are to be used/ built on external expertise. Yet, it was found that the companies participating in the COM^3 pilot are keen on networking events organised by the municipality (in its facilitating role). Another pilot region mentioned a completely private business network (paid membership required), offering courses and a support network. Furthermore, it was discussed that companies rely heavily on the support by their IT providers for example when making use of certain cloud services. One interviewee noted that bigger companies have the capacity and the budget to get private support/ specialists and private digitalisation support, e.g. by hiring someone to get the knowledge in house, while smaller ones who are interested or see the challenge of digitalisation rather look towards public digitalisation initiatives. In one region, a lot of consulting companies, also small ones, are found in place for the petroleum industry, also regarding digital tools, education and adjusting e.g. EIP systems. Similarly, one interviewee explained that there are many local companies in place which are for example assisting in setting up websites, also quite some are spinoffs from the university- so graduate students working related to media, PR and marketing. In general, the digital sector at place is growing fast in that regard, although it is still small. Furthermore, it was noted that the county council/ local councils tend to contract with private providers to deliver innovation support, e.g. also digital skills training, which can be seen as an advantage in respect of getting the (latest) external insights from an expert. That it depends on the topic was also stressed by interviewees from another region. For example, new software is most likely purchased from private companies. If innovation is related to it, then a business might be eligible for public funding, e.g. related to AI. It was also mentioned that in 2020 a lot of funding was made available, supporting small companies in their digitalisation processes (also to be linked to the covid-19 crisis). However, they added that the business development centre reported difficulties in supporting businesses, claiming that businesses tend to focus on the operations and do not think on a larger scale/ more strategic. Hence, they are not focused on developing the operation process with the help of digital technologies to also save time and money, but rather stick to business as usual.

4.1.7.Rural businesses

Key findings/ messages

→ Partly rural-urban adoption differences noticed, depending rather on the focus of the business

Figure 8: Key findings/ messages for this chapter

When asked whether there are differences noticeable when comparing rural with rather central located businesses, the impressions varied. Some of the interview partners noticed differences, for example noting that the more rural a business is, the more difficult it can be to reach it by public support or even to reach smaller municipalities. Either they do not have the capacity or wish for immediate results for any effort, although there can be exceptions. It was also discussed that some of these places may have established kind of own ecosystems, representing rather traditional businesses or small scale farming, e.g. more tending towards alternative/ ecological lifestyles. Similarly, one interviewee suggested that in the very rural and very sparsely populated area of the region (coastal area), it is more of a challenge to engage businesses, but no more detailed information about that was available. In another case, in some parts of the region, the poor internet connection should still be addressed, so it was stated that until now businesses located there had troubles in just getting basic digitalisation efforts going. Moreover, one interviewee had the impression that most of the interaction and cooperation within the municipality takes place connected to the chambers of commerce with the main focus on tourism. Thus, the ones not related to that or not located in town centres are probably less orientated towards the possible support possibilities by the municipality. This had also been noticed in the COM³ pilot -none of for example businesses related to crafts or agriculture signed up, so it is concluded that probably not all can be reached by such public initiatives. A few times, no rural-specific differences were to be found. Once it was discussed that in general, businesses don't reach out to the municipality, only when they have got a big problem and another interviewee claimed that the building industry is harder to get digitalised or also business activities by handymen or craftsmen. Furthermore, the farming sector was named (the closer one gets to the farmer) and small companies (1-2 person companies). It was argued that the more complex the companies are, the more complex the structure of the goods they are producing or selling, so also more data has to be handled and that this favours digitalisation. In another pilot region, the impression was that many companies in the rural are quite advanced, as using digital tools is an advantage compared to travelling far distances instead. The municipalities in remote areas also have industrial support organisations providing funding, furthermore, it was added that remote doesn't necessarily mean that the areas are poor, because in that case generating water energy results in income. Thus, it can be afforded to support companies and provide good infrastructure.

4.2. Regulatory support and financing schemes

Key findings/ messages

→ Various financial and regulatory support mechanisms listed

→ Some, rather smaller businesses struggle to make use of support mechanisms

→ Platform for bundling support offers and improve communication suggested

Figure 9: Key findings/ messages for this chapter

4.2.1. Existing initiatives

Various initiatives are already existing, as the list below shows:

- Funding and initiatives are available, but not in a very organized kind of way. It was rather experienced as a very scattered subsidy landscape regarding all governmental levels
- The chamber of commerce and the economic development department of the county are mainly responsible for that
- The regional business support programme, seen as the most important partner, was found to be successful in supporting businesses. Furthermore, the possibility for direct contact with subsidy providers (national or regional) was named and the COM^3 pilot shall furthermore assist SMEs by providing them with an SME database
- A national innovation organisation provides support for (startup) companies and the municipalities channel the public support funding. It was added that this structure exists already for longer, proving to work quite well. In general funding and regulatory support is not seen as a problem and well-developed
- The governmental website for businesses in the region was listed as one of the main support tools for receiving advice, next to the website of the chamber of commerce. Regarding financing, the county council and district councils provide grant funding, next to national funders. Funds are thereby often linked to the grand challenges defined in the national strategy (e.g. related to robotics and AI, carbon-neutrality…), also the university of the region gets funding through that for collaborating with businesses (knowledge transfer partnership)
- At the national level, there is a guidance platform for finances, schemes etc. available, this is used by the municipality and business development centre to support businesses. Moreover, the municipality offers free access to auditors and assistance and a small department of the municipality provides suggestions for the business support staff, e.g. on funding possibilities for a circular economy. It was also added that there is still the possibility to ask the industry organisation for help

- The municipality was perceived as being open and equipped to answer questions related to these topics, described further that during the covid-19 crisis, the municipality was also responsible for e.g. channelling the financial support measures for businesses and sharing information via online meetings. It was also mentioned that there is an organisation funded by the national government supporting companies with consultancy (cheap or even offering services for free)
- Indirect support measures by the municipality were listed, like the creation of a digital agenda together with an external expert. This shall also contain procedures on how to assist companies, for example having an advisor who can be contacted (e.g. regarding funding). Moreover, the information hub in place was listed as an initiative as well, together with an innovation hub still in planning. More networking activities shall be planned with companies, thereby trying to involve also businesses which are not interested via the (innovation) advisor and through centres getting established, for example by students working together on a topic with companies

4.2.2.Challenges and wishes

Several challenges and possible solutions were identified regarding financial and regulatory support:

- The interviewee had the impression that businesses want more and specific communication with and information provided by the municipality, also regarding funding possibilities. Therefore, it was suggested that a communication platform could be helpful for the exchange with the businesses, although it was not directly asked for it. Within the COM^3 project, existing options and support measures will be scanned to see how these can be improved
- There is no organised platform regarding financing and support in place, so information about that is not being gathered so far. It wasn't discussed with businesses yet, but it was expected that they would wish for that as it is seen as a big obstacle by the interviewees to have such a scattered landscape. Additionally, due to the crisis, there have been too many applications for some funds, so the entry rules/ selection criteria needed to be adapted and the waiting times expanded, showing the need of businesses for extra financial support
- Convincing some companies that innovation is important or convincing some people of the opportunities digitalisation can offer was found as a challenge. It was stated that some businesses are hard to reach. Therefore, students shall get involved to develop a communication strategy for reaching these businesses
- Smaller SMEs showed to have difficulties with handling funding and all the tasks to be done to secure funding. Lack of time or deciding on which one is suiting/ how to find suiting ones are decisive factors for that, and often, also no specialist is hired to take over the task, meaning that the owner/ CEO is responsible to do that next to his/her other tasks. Therefore, the interviewee suggested that the municipality could do better in supporting businesses to acquire available funding
- Microbusinesses were found not being able to afford match funding, as business support earlier on often went through ERDF (European Regional Development Fund) funds requiring

half of the money provided by the business itself. Another challenge can be that businesses don't understand the specialised advice they get, e.g. also regarding digital technology adoption

- The regional business support programme requires more persons working specifically on digitalisation questions that businesses have (understaffed)
- The main obstacle identified in one region is the lack of available, suitable employees in the region to support the development of rural SMEs, especially as the population density is in some parts very low

4.3. Exchange with businesses in COM^3 project

When asking the interviewees for the main themes and issues arising during the exchange with businesses participating in the COM^3 pilots, various findings were presented.

- In two different pilot regions, businesses explicitly wished for more exchange possibilities with the municipality and more local collaboration in general
  - once specifically regarding collaboration between businesses and hotels and stakeholder collaborations with a focus on circular economy (sharing data and material)
  - interested in and wished for help regarding their business development (business model, strategy, reaching the markets), also marketing was discussed and the role of information technology (security, competencies, strategies etc)
- Businesses did not really mention issues during a focus group meeting, interviewee got the impression that there is no incentive to change anything as long as it is still working as it has been established → claimed that eye-openers needed, in that case the collection of data
- Businesses rated their own level of digitalisation as low, while the interviewee had the impression that they are partly quite advanced already → bringing companies together for exchange probably fostered the self-esteem in that respect, exchange of challenges proved to be valuable, as possible solutions can be discussed and collaborations established
- Businesses had the idea to establish a platform where they can explore how they are scoring in a specific sector compared to other businesses (especially regarding digitisation efforts)
- The main issue discussed was finding the right funding while there are a lot of options available, furthermore how the administration can be facilitated after acquiring funding
- The interviewees experienced some companies just jumping into using digital tools without figuring out beforehand what is actually needed. Therefore, during meetings (e.g. workshops, training) the importance of businesses setting digitalisation efforts into the context of the specific company was stressed→ first to understand own context in order to benefit most of digitalisation efforts, as digitalisation itself shouldn't be the aim
  - three steps recommended: determining customer and product/service, then applying lean management and finally applying digital tools on the lean processes

Another issue for businesses mentioned was the training of people to make use of different methods, also regarding the application of digital tools/ switching to new digital solutions within businesses (sharing competence and knowledge)

- Two more, rather region-specific challenges were discussed:
  - Limited recruitment possibilities was an important topic for businesses in one region
  - Some of the businesses were affected by Brexit as well, e.g. due to higher shipment costs
- The following-pilot specific findings were reported:
  - The online local market platform which shall be developed was seen sceptical by supermarkets in the region as it is possibly a concurrence for them, furthermore, some businesses were not interested to join as they were afraid of additional work or used to sell directly to customers. However, the participatory approach proved to be a success, as various possibilities and strategies were discussed/ developed together (most businesses active in that also got involved in the platform), fears and prejudices were addressed
  - Companies that participated in the pilot to collaborate with students regarding a specific problem had mixed feedback. Once, it was wished for more practical support, more engagement with the student or just less and also to give back to the student/the community in general. Besides that, ideas have been generated/ developed further together and the possible impact will still be monitored further on
  - Exchange among businesses regarding the usage of data proved challenging as there are big progress differences. Some businesses had difficulties deciding on where to start with using digital data while on the other hand, bigger companies were often already working with data and were therefore rather interested in start working on it as a community. However, the exchange possibility with other companies and the public sector about similar issues was valued.

4.4. First effects of Covid-19 crisis

General first impacts

Key findings/ messages

→ Less mobility during the lockdowns and partly change of location to work or even live observed

→ Some sectors more affected than others, partly impacts on employment weren't as bad as expected at the beginning of the crisis

Figure 10: Key findings/ messages for this chapter

4.4.1. Mobility

In general, our interviewees observed less traffic due to home office regulations and similar, during the interviews it was partly mentioned that the movements were still different. Once it was also mentioned that as soon as travelling was less restricted again, people partly travelled within the country to their cabins/ summer houses. Moreover, it was mentioned that naturally, also less travel abroad for both, leisure and business, took place and that people adapted online solutions and the possibility to work from different places. Once it was additionally discussed that one possibly needs to rethink certain investments for more vehicle capacity on the streets if covid-19 altered movement patterns permanently in some respect, e.g. more people working more locally again if the possibility is given.

4.4.2. Housing

During the covid-19 crisis, one of our interviewees reported a (temporary) trend to move from the metropolitan areas to the less crowded regions, as the vicinity to the workplace became less important when the possibility was given to work from home. This aligns with another interviewee telling that there was a trend to move just outside of the big city. However, at some remote places, the available internet connectivity was still comparably slow, suggesting that at the same time, this puts people off from moving there. On the other hand, one interviewee added that the demand for houses was already high in the region before the crisis and no change in that was experienced during the crisis. Partly, it was recognized that people were also moving to other places to work from, like from their summer houses/ cabins, and once it was also discussed that it is of interest for the municipalities to get these visitors to stay permanently and also that the discussion came up to allow employees in the public sector to work from home. Moreover, it was still discussed that new solutions for the workplace were/ are coming up, like getting a unity to work in the own backyard.

4.4.3. Employment

When asking about the impact on employment patterns in the pilot regions, it was clarified that certain sectors/ branches were more affected than others. In specific, the tourism/ leisure industry (e.g. also hotels and restaurants) and event/ arts and entertainment sector were named as being strongly impacted. Furthermore, it was once mentioned that especially young people were affected (entry-level jobs falling away, e.g. at cafes or shops) and steady growth of unemployment was experienced regarding jobs mainly to be executed with lower education levels.

Of interest is also that several times, it was mentioned that impacts at the beginning of the crisis were quite striking, e.g. that the unemployment rate rose first (due to companies shutting down and dismissing flex-workers), but that the situation improved again over time. However, it was added

that it is partly also not showing up in the local statistics that for example in the tourism sector, a share of the employees normally working for that is from abroad. This was affirmed by another pilot region from the same country, stressing that the region depends on labour from abroad and that covid-19, therefore, poses a potential additional challenge on the scarce employee pool. Another interviewee stated that the first expectations of businesses were very pessimistic, but after some months it showed that the impact was not as bad as initially feared when looking at the unemployment rate, the turnover loss etc. Similarly, another interviewee reported that the first impact was experienced as quite striking, then it went down a little bit over time, but it was also explained that people were still on low fare during the interview and that unemployment patterns doubled in one year. However, it was added that other activities continued (e.g. farming). This fits the statement from another interviewee, noting that other sectors were also profiting from the crisis, e.g. with delivering food and selling items online. For example, selling fresh fish to people working in cabins/ summerhouses. Thus, it was concluded that it is very much dependent on the company/ industry, for many companies in the region it was business as usual except for much more people working from home and meeting digital instead.

In one pilot region there were no real big impacts to be seen just yet, the year 2020 had even the lowest amount of bankruptcies in the country since around 20 years, so it was argued that until the moment of the interview, the support packages of the national government have been working in that respect. By another interviewed region from the same country, it was added that companies got financial support from the government, but only by meeting the precondition that the employees were kept employed. Most of the companies in the country made use of it. At another place, where it was observed that the event sector was strongly affected, the employees from that sector were taking up other jobs, e.g. rather in the construction sector. Moreover, as the interviewee had insights into the construction sector, he explained that fewer office/ buildings for companies will be built (plans for new buildings in that respect reduced by half), as it is expected that more people will continue to work from home or a satellite building, e.g. regional (coworking) hub, so architects/ planners also changed to designing workplaces for the backyard or similar and creating coworking spaces. Therefore it was suggested that also new opportunities are provided by this development. This suits the remark by another interviewee, noting that more people were working from home and that it is expected that this will be more the case in the future, as people experienced also the advantages of it like more spare time/ less time used for commuting. Another discussion point coming up was that the crisis meant a double-hit effect at least for businesses located in the UK, as they were already impacted by Brexit as well.

Key findings/ messages

→ Several and diverse initiatives initiated during the covid-19 crisis

→ Occasional limitations in internet speed experienced

→ Partly, the crisis boosted the general awareness of and switch to digital alternatives

Figure 11: Key findings/ messages for this chapter

4.4.4. Initiatives mentioned

Several initiatives in the pilot regions were presented. One of these was a digital voucher scheme, started by the county council for especially small businesses offering the opportunity to apply for 5000 Pounds usable for software, hardware or consultancy during the crisis. That project was such a success that the call had to be closed faster than planned again. The university in place also offered online webinars for local businesses to become more resilient, e.g. how to do marketing online, integrating digital technology within a business etc. Interviewees from another pilot region explained that the mayor offered online meetings regarding various topics and provided information about the latest developments in the municipality instead of visiting for example one company at once. Through that, more people were directly involved and the interviewees experienced it as a more efficient solution. Once the main topic was thereby digitalisation and the opening of an AI house was done virtually. Furthermore, advice/ consulting was provided locally regarding financial support/ funding possibilities in general, but also e.g. about digitising the sales process (business support by the municipality). Additionally, a live streaming setup was created to support businesses, supporting for example the fruit sector and retailers by creating videos or sales meeting (part of COM^3 pilot). Meanwhile, in another pilot region, students helped local businesses to make use of a local online (retail) platform. Yet, it was noted that it was sometimes still a challenge to convince businesses to make use of it, as the shopping idea persisted to sell person to person. Furthermore, shops expected issues with their logistics and were sometimes suspicious regarding the costs of using such a system. It was also expected that the crisis wouldn't last that long and things going back to normal soon. Other reasons for refusing the participation was the usage of an own website/ webshop and arising money issues as the lockdown continued. One interviewee noted that initiatives have been taken to enable every family for home-schooling during the pandemic regarding both, equipment and connectivity. Moreover, private initiatives were discussed as well, like the launch of websites for

restaurants to enable food delivery and an initiative of organic farmers normally selling on markets, starting to deliver home to customers instead, either through an intermediary or themselves.

Figure 12: Initiatives launched during the covid-19 crisis

4.4.5. Internet connection

It was observed that good internet connections at place enabled people to work flexibly from various places (if they have a respective job), e.g. also from their remote summer houses. In general, no massive network capacity issues were observed among the interviewees, but it was reported that in one of the regions, there are a few rural areas left where support is needed to improve the existing connectivity. Moreover, in one case, it was reported that colleagues of the interviewee living in rural places had insufficient internet connectivity for group video conferences and similar. Moreover, one interviewee mentioned overburdened systems during the first days of the lockdown. In one case, there was no capacity issue given during the lockdown, but the interviewees were rather concerned about the future-proofness of the internet connectivity, as they are running behind regarding glass fibre instalments. Covid 19 increased the awareness regarding that, so extra investments/ progress has been made by the providers. However, the financial support and role of the local and regional governments still have to be clarified. During one of the interviews, it was also discussed that one of the local councils has a community broadband officer in place advising communities. For example, he recommended switching off smart devices not being used to improve the speed at home during the covid-19 crisis and he already assisted some villages to get 1GB connections through grants. Another discussion point arising during one of the interviews was that there were quite some people not being used at all to apply digital devices for video calls etc. and that the hardware was partly

missing, especially when suddenly a whole family needed to make use of it due to home-schooling etc.

4.4.6. Awareness

In general, it was discussed that the crisis increased the awareness about and the importance of digital solutions. It was observed that people get more used to utilizing digital tools for their work, especially regarding digital meetings which increased a lot during the crisis. Furthermore, it was argued that it boosted the improvement of tools already in place. Once it was explained that there were no new incentives in that respect, but that ongoing initiatives suddenly got more attention, for example, the digital agenda and the digital hub planned to be located in three cities of the region. The crisis was experienced as a catalyst for businesses to use their website more as a way of promoting their products and services, maybe also to sell directly. Tools such as Teams and Zoom were used more readily to communicate. However, it was also suggested that it can be difficult to reach the targeted businesses if they are not fully embedded, e.g. also on social media. Another interviewee experienced less criticism towards digitalisation efforts, as the usability of digital solutions was suddenly less questioned. The new normal of online meetings was mentioned as an example, which was not to be imagined on a regular basis before the crisis. In one pilot region, the rise in awareness resulted in a positive response regarding demand inquiries for broadband development in the area. It was argued that, as the connectivity was partly a problem during the lockdown, people rather saw the need for a glass fibre connection at their place. In November 2020, the decision was then made that all rural areas in that particular region should get glass fibre connections and in 2022, everyone should have the possibility to connect to glass fibre. One interviewee also noted that while it is difficult to generalize, more creativity was observed as digital options were used more and for different contexts (online Friday beer bar or online concert named as example), so due to lockdowns, the businesses were innovating to continue doing business. A new angle on how digitalisation can be used was detected and in general boosted (for example using digital sales, arrange digital fairs etc.) However, it was also stressed that on average, there was already a good awareness of digital possibilities beforehand. This is also what the interviewee of another region stressed- that the general awareness was already present beforehand, so the impression was that the crisis hasn't had a big impact in general, but that for example contactless payment got adopted even more.

4.5. Digital hubs

4.5.1. Physical hubs

Key findings/ messages

→ At least in surrounding of the pilot regions hubs to be found

→ More often business-focused (coworking, incubator…)

Figure 13: Key findings/ messages for this chapter

When discussing physical hubs, two interviewees stated that they have no hub in their pilot region but either in the neighbour municipality or neighbouring cities. However, in one of these regions, it is already planned to establish one and in the other region, at least interest is shown regarding the possibility of a (coworking) hub. The hubs of the neighbouring regions then also fall in the categories business incubator and coworking space. All the other interviewees mentioned having one or several physical hubs in their pilot region, as shown in the following list:

- Several coworking spaces and incubators located in the region with differing profiles (e.g. more industry-specific, some sector-specific)
- Municipal information and awareness hub in place, furthermore a so-called digital society hub is located in the neighbouring bigger city, thus the aim is to eventually become a part of that hub to increase visibility
- Regional business development centre is a European digitalisation hub with focus on AI, supercomputing etc. Municipality has furthermore an AI house (community office for businesses interested in digitalisation and a coworking space with the possibility to use high technology applications) aiming at sharing knowledge, establishing networks and developing the region in general. Different branches are involved and it also fits the category-specific technology hub
- Digital workspace and IT hub in region (access to ICT information, advice and support given, also functioning as coworking space and incubator). The IT hub shall bring students and SMEs together to work on questions related to IT
- Two business hubs for startups are to be found in the region, it is added that these are cheaper for renting an office compared to private offers. Aim is to bring entrepreneurs together and stimulate and support the companies. It is furthermore added that glass fibre is available there but the interviewee wouldn't directly describe them as digital hubs
- One coworking space recently opened in town for digital businesses, another one is located in a village pub (mainly created to bring people working alone at home together), moreover three technology hubs are furthermore to be found in the region (offering access to the latest

technology, workshops and more, one of these is specialised in motion capture). A local district council is offering local hubs as well

- With help of the Interreg project CORA, a business hub was created which shall become a digital hub regarding glass fibre installations, as sharing of the infrastructure shall be tried out with other service providers. It provides businesses there with the opportunity to make use of high-speed internet and it shall also help to raise awareness regarding the possibility to take over glass fibre installations at the municipal level when suiting (instead of waiting for big service providers). Next to that, a lab was named which offers the opportunity to try out and experiment with new technologies and that in the bigger cities around, private coworking spaces are to be found

Figure 14: Type of digital hubs to be found in the regions

4.5.2. Covid-19 influence

Key findings/ messages

→ Generally, the usage of physical hubs was negatively affected by the covid-19 crisis

→ Responses to the covid-19 crisis were found in physical hubs as well

Figure 15: Key findings/ messages for this chapter

While covid-19 had some negative impacts on existing hubs in the pilot regions, like fewer activities taking place or that they had to be closed, it was mentioned that alternatives like online webinars were created as well. Furthermore, it was discussed that in one region, the awareness for the necessity of the IT hub under development was increased and one interviewee reported about a business even making usage of external coworking spaces during the crisis to limit the infection risk among its employees. One interviewee reported that in the neighbouring city, a coworking space at the beach still got implemented in the summer of 2020. However, in another pilot region, a physical hub should have been opened in spring 2020, but the crisis negatively affected it as a lockdown came into place at that time.

4.5.3. Online hubs

Key findings/ messages

→ No 'typical' online hub in any of the regions established

→ However, online support/exchange mechanisms can be offered by regional stakeholders

Figure 16: Key findings/ messages for this chapter

Mostly, the pilot regions were not aware of any specific local or regional online hub. Once it was mentioned that there should have been one in place, but that there was no real evidence of it to be found. One pilot region was aiming for establishing a platform or similar within the COM^3 project to foster the exchange with the private sector and in another case, the regional authority was working on creating a platform on which SMEs can find other SMEs. Furthermore, other online exchange possibilities in place were listed: Mainly by business support organisations offering networking and collaboration possibilities/ (online) events, e.g. about IoT and AI, common marketing portals of the tourism sector, municipality sharing knowledge online and using social media/ websites for communication. Once it was suggested that there might be platforms for virtual exchange in place, but the interviewee had no overview regarding that. Another interviewee argued that the established support organisation should keep developing such measures if needed, as it also should be easier to find such offers when the organisation is already known by the businesses. Therefore, it was suggested that the regional authority could support the creation of a better online network, facilitating exchange as it was argued that the interaction could be improved among businesses and the public sector.

4.6. Cybersecurity

4.6.1. Public authorities and educational institutes

Key findings/ messages

→ Strong reliance on experts within public authority/ educational institute

→ Level of prevention measures differs, some more active than others (training, incident response policy and secure exchange of data)

Figure 17: Key findings/ messages for this chapter

The overview regarding cybersecurity measures within the partner organisations was mixed. Two times it was mentioned that cybersecurity awareness training is offered and once specifically also expected among companies member of the interviewed organisation linked to the university. By one interviewee employed at the local authority, it was added that the training is organised by the national organisation of the municipalities (which also supports digitising the services offered). Once it was mentioned that training was provided by the internal IT specialist, and two interviewees were not aware of any cybersecurity awareness training within the organisation. One interviewee responded that there is not really training provided but activities are taking place, e.g. every two weeks a meeting during which specific topics are addressed. It was also added that a lack of training can probably be explained due to a shortage of human resource capacity in that respect within the organisation. Four times it was stressed that the employees mainly rely on the IT department/ specialists within the organisation (e.g. two-stage verification in place, also after phishing incidents or rather ad-hoc initiatives like sending warnings out). When discussing incident response policy, one agreed that there is one in place and once it was explained that the reporting of incidences was also communicated clearly and is newly in place. One interviewee added that it is advised to contact the IT department straight away when there is any incident noticed and several times, it was noted that there may be an incident response policy in place, but the interviewees were not sure about it (once warning emails and information how to react after some incidents in the past were mentioned additionally). Regarding the secure exchange and information communication, it was twice responded that training is provided in that respect. Once it was explained that, when new GDPR regulations came into place, there was a lot of training organised. Another interviewee said that training is available when it comes to using the secured platforms in place, moreover, there are rules in place regarding storage, confidentially etc. Twice, it was then discussed that there is no sufficient activity regarding that yet- at one organisation, training on secure exchange was not thematized yet, therefore it was identified as a gap within the organisation and once it was suggested to pay more

attention within the organisation regarding sending sensitive emails etc. However, this goes together with the fear that more rules could complicate work processes.

4.6.2. Cybersecurity awareness among SMEs

Key findings/ messages

→ Level of awareness among businesses differs

→ Cybersecurity tends to be neglected

Figure 18: Key findings/ messages for this chapter

Two times, it was reported that recent cyber-attacks getting attention in the media raised the awareness of the risk among businesses in the region. In another case, high awareness regarding cybersecurity was noticed due to the strong linkage to the petroleum industry, mainly among larger companies. However, also smaller ones are adapting, especially if they are dealing business to business where certain standards have to be met. One interviewee had the impression that businesses participating in the COM^3 project are aware of it, but it wasn't discussed in detail with them. Another interviewee pointed out as well that it wasn't discussed directly with the businesses, but when in general discussing the potential use of digital technology with them, it appeared that cybersecurity is not a top priority. Therefore, it was suggested that this could be problematic in the sense that first something needs to happen before action is taken.

Several times, concerns were raised. One of these was that smaller companies are perhaps rather reluctant and it was discussed that one can probably always do more, as also tools are changing all the time. Another interviewee got the impression that many companies have the idea that it won't happen to them, so it was suggested that there is still work to be done to get businesses acting respectively (training, develop incident response policy…). It was further outlined that the topic is hard to grasp as it is virtual and attacks are maybe not even recognized. Therefore, it is difficult to convince businesses to invest in it (comparison with insurance). Another interviewee noticed also a lack of awareness among businesses, stating that they perceive themselves as not being big enough or that it is also not really known what to do about it. Furthermore, cybersecurity was not prioritized by the businesses although it was noted that they may probably be open to training possibilities. They were moreover found to rely heavily on providers (e.g. often using various cloud services), assuming that it is taken care of the security. Therefore, the interviewee recommended training for SMEs regarding that (what to take into account when making use of cloud services etc).

5. Main challenges identified

As shown in the previous chapters, the circumstances and conditions in the various pilot regions partly differ. Still, we identify the following major challenges found in some cases:

- For fostering digital literacy or in general uptake of digital solutions, **fragmented initiatives** were mentioned as a challenge
- Sometimes there is **no complete overview given** regarding activities/ stakeholders in the field of digital initiatives, several times it was wished for **better exchange/ collaboration possibilities** (also partly businesses wishing for that)
- Regarding cybersecurity a **strong reliance** on experts/ cloud providers was found, some businesses **underestimate the risk** or the **resources** to improve cybersecurity are **missing**
- Especially smaller businesses partly missed **overviews regarding** their **progress in digitalisation efforts** compared to other businesses or tending to not make pro-active changes, rather sticking to **business as usual** if possible (long-term perspective neglected)
- Regarding funding and regulatory support partly found as being a too **scattered landscape** when trying to find the right funding, further a **hurdle to apply for funding**, especially when again **resources (human and financial) are missing** for it
- Some businesses **hard to be reached** with public support measures in general, therefore also sometimes rather the **'usual suspects' making use** of it (also more traditional businesses located in remote areas sometimes expected to be rather reluctant to offers)
- **Covid-19 crisis** as an additional challenge affecting all regions, resulting in additional pressure on some businesses
- Even when awareness is on the rise regarding **digital technologies** and their potential among businesses, it is found as a challenge to identify what is exactly **needed**/ how to best **approach** it
- Partly, the improvement of the internet connectivity/ progress of especially **glass fibre developments** was still a topic for some remote places in the regions
- Instead of sectoral differences or based on the rurality of a business location, the **size of companies** was several times put central **determining** the **degree of digital technologies used** in business processes and beyond (some exceptions are startups and other small businesses specialised in or focusing on digital solutions)

6. Final remarks

While our research findings give a first impression of the digital business landscape in the pilot regions, we want to stress at this point that there is most likely no complete overview for each of the regions given. One of the reasons for that is that we cannot expect the survey and interviewees to possess knowledge about all existing activities and initiatives within the regions. Moreover, sometimes no hard data/ statistical information was available. Rather, interviewees and survey participants provided us with impressions and their individual insights. Therefore, we have also not attempted to create any regional/ national profiles. Still, we are convinced that the findings presented in this report can be helpful for local and regional public authorities based in the North Sea Region and beyond.

Some good examples and possible solutions were already indicated throughout this report. However, we were not able to take a closer look at these within the scope of this research. As a follow-up, training material will be developed, combining the input we have received from this project study with existing information and other project outputs. Next to that, the pilot activities will be closely monitored and all lessons learned from these reported as well.

For more information about the COM^3 project and the various pilot activities please see: https://northsearegion.eu/com-3/