German Economic Team

UKRAINE

POLICY STUDY 04|2021

Progress and challenges in the digital transformation of businesses in Ukraine – Results from a representative business survey

by Dr Alexander Knuth, David Saha and Garry Poluschkin

Berlin, October 2021

About the German Economic Team

Financed by the Federal Ministry for Economics and Energy, the German Economic Team (GET) advises the governments of Ukraine, Belarus, Moldova, Kosovo, Armenia, Georgia and Uzbekistan on economic policy matters. Berlin Economics has been commissioned with the implementation of the consultancy.

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Acknowledgements

The authors would like to thank the Institute for Economic Research and Policy Consulting (IER) in Kiyv, especially Veronika Movchan for indispensable help with designing and carrying out the survey on which this Policy Study is based. We are also grateful for helpful research assistance by Sofia Sapozhnykova.

Executive Summary

Digital transformation is one of the most important challenges presently faced by companies. As new technologies and methods become available, companies can gain huge advantages over their competition if they adapt quickly to the new age, but risk losing out if they fail to transform quick enough. While Ukraine has a fast growing IT sector and ambitious goals for digitalisation, present international rankings attest deficits with regard to digital transformation at societal and economic level. Especially the digital transformation of the business sector is of crucial importance to ensure the dynamism of Ukraine's economy in the digital age.

This study analyses the state and challenges of the digital transformation for the Ukrainian business sector. We have undertaken a representative survey of executives of 500 Ukrainian businesses across all sizes, industries and regions. Our methodology permits comparison with similar surveys conducted for Germany and OECD countries.

To structure our analysis, we draw on a strategic management framework, analysing three levels:

1. The company level: What measures have companies undertaken towards digital transformation in their internal processes and product offerings?
2. The competitive environment: What pressures to adapt and transform do companies perceive, how are competition and markets changing in the digital age?
3. The macro environment: How do external circumstances such as factor markets and policy facilitate or hinder digital transformation of companies?

Pressures in the competitive environment

Ukrainian companies are relatively optimistic on digitalisation, but mostly feel behind their competition in digital transformation. 92% of companies consider digital transformation as an opportunity rather than a risk (Germany: 98%), but only 17% consider themselves as forerunners rather than latecomers (Germany: 28%). It is clearly observable that competition dynamics in Ukraine have not yet substantially changed due to digitalisation.

Even more important, compared to the benchmark from Germany, competitive pressures mainly comes from digitally more advanced companies in the same sector rather than companies outside the sector. Only 24% of companies stated that competitors from the internet and IT sectors were entering their markets, compared to 64% of companies in Germany. This will probably not last: While tech companies and other global innovators may not target Ukraine's market yet, they will eventually do this. Hence, we believe that competitive pressures will rise sharply in the future. Ukrainian companies should be aware of this and prepare when there is still time.

Digital transformation at company level

Looking at digitalisation at company level, it becomes apparent that Ukrainian companies still have much ground to make up. While a similar share of companies compared to Germany reported that they have invested in the past 2 years (54% compared to 50% in Germany), with the highest share being reported by medium rather than large companies, the actual state of digital transformation appears to be behind other countries. Most Ukrainian companies mainly use rather basic digital tools and technologies. Use of digital tools such as electronic invoicing, use of e-government facilities or

websites is widespread at almost 80% of companies or higher. However, less than half of companies use enterprise resource planning software and only 30% use cloud computing service, even though this is becoming the norm rather than the exception globally. Differences emerge across companies sizes, with large enterprises leading in technology adoption.

It is vital for companies to organise responsibilities and strategic processes in order to successfully manage digital transformation. Here, clear deficits emerge: Even among large companies, only 20% of Ukrainian companies have a digital strategy. In comparison, 38% of companies in Germany have a central digitalisation strategy and further 39% have a digitalisation strategy for company divisions. Also, only few companies across all sizes have assigned responsibility for digital transformation to a digital unit or digital transformation coordinator. 24% of large companies have undertaken no measures at all in this regard (the share is interestingly lower for small and medium, but not micro, companies).

Looking at output in terms of product offerings, only 27% of companies are offering new products or services (Germany: 60%) whilst 67% of companies are adapting existing products (Germany: 75%). Companies in the ICT and industrial sectors are more advanced in this regard than companies in non-ICT services or the agricultural sector, even though especially services offer much potential for digital innovation.

Perceptions of obstacles in the macro environment

Ukraine appears to have a skills gap that hinders the digital transformation of companies. After lack of finance (38%) – a problem not specific to digital transformation – most companies cited lack of experienced employees (35%) or expertise (31%) as an obstacle to their digital transformation. This is somewhat surprising as the country has a strong IT sector – but the IT sector is mainly export focused and has little points of contact with the rest of the economy, apart from competing with other sectors for skilled workers.

Public regulation or infrastructure were less frequently mentioned as obstacles (16% and 19%). Nevertheless, there appear to be issues with protection of digital data and property rights, and the lack of a functioning e-signature.

Policy recommendations

Whilst the Ukrainian government is already working on addressing the problems we identified with programmes such as Diia Digital Literacy or Diia Digital State, we provide some initial guidance on how measures might be further focused in the future. In particular, the skills gap should be addressed and some possibilities exist to combine measures directed at the skills gap with ones aimed at improving financing for companies - e.g. by grants for digital experts. Furthermore, support such as the 5-7-9 programme for discounted credit provision to SMEs could be improved for giving access to financing for digital transformation investments. Finally, the government should also address the regulatory gaps identified as obstacles for transformation by companies.

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1 Introduction

Digitalisation is one of the biggest challenges and transformative processes of our time. Whilst creating massive opportunities for societies – ranging from quick access to information and services to much more profound changes and efficiency gains in all areas of the economy, the public sector and private lives – it also requires individuals, companies and countries to adapt and transform in order to reap the benefits. The digital transformation of countries is of key importance for countries in this regard: Companies and private sectors that adapt well to the challenge are in a good position to grow fast in the future whereas laggards risk losing out to competition from more digitally advanced companies and countries.

Although Ukraine boasts a highly competitive and fast-growing IT sector[1], it appears that the digital transformation of the economy as such is coming along rather slowly. In most international rankings on digital transformation, Ukraine ranks at best in the middle group:

- 55th out of 63 countries in the IMD Digital Competitiveness Ranking 2021[2]
- 77th out of 141 countries in the CISCO and Gardner Digital Readiness Index[3]
- 64th out of 134 countries in the Network Readiness Index 2020[4]

The Ukrainian government has started various initiatives to foster digital transformation. The digital transformation of the Ukrainian economy is a key area of the "National Economic Strategy 2030", the major government strategy on economic growth, including ambitious goals on the growth of IT-related markets and on uptake of new technologies such as cloud computing. Specific government support programmes include support for the foundation of businesses (Diia Business), improvement of the level of digital education of businesses and citizens (Diia Digital Literacy), strengthening the digitalisation of e-services as well as digital communication with state bodies (Diia Digital State), the development of financing support for start-ups (Ukrainian Start-up Fund) and the creation of special legal frameworks for IT companies (Diia City).

In order to inform policy to guide and support the digital transformation of Ukrainian companies, it is necessary to understand where companies in all sectors of the economy stand today, what pressures they are already subject to and how their progress may be facilitated. This study presents the results of a representative survey of 500 companies in Ukraine on digital transformation. Our results indicate that Ukrainian businesses have so far not transformed very much, in part due to yet limited competitive pressure. However, as the competitive pressure from the outside will certainly rise in the future, it is important to act now and accelerate the digital transformation of the Ukrainian economy.

The study is structured as follows: Section 2 next briefly explains the conceptual framework of the survey. Section 3 briefly describes the sample and the sampling method. Sections 4 to 7 highlight the main findings of the survey. The policy study ends with policy implications in section 8.

[1] GET (2021a), Link.

[2] IMD (2021), Link.

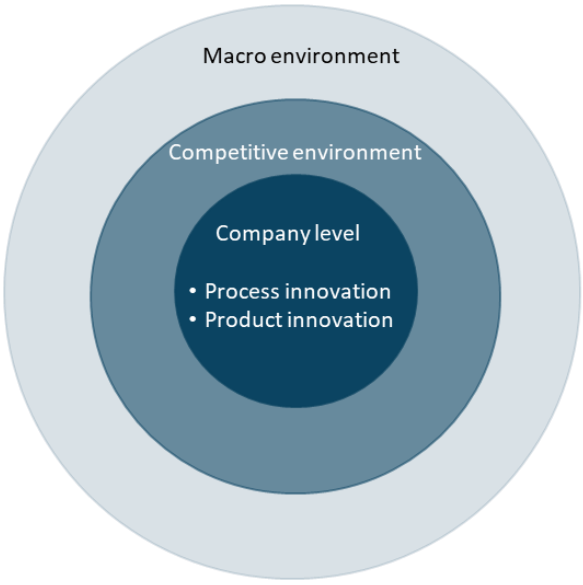
[3] Cisco (2019), Link.

[4] Network Readiness Index (2020), Link.

2 Digital transformation: A strategic challenge for companies

We apply a standard theoretical framework of strategic management[5] as a basis for structuring our analysis. This framework helps us to gain insights into the corporate sector from the strategic perspective of business leaders. As figure 1 illustrates, the framework distinguishes three levels: The company level, the competitive environment and the macro environment. The challenges and the progress of companies in digital transformation are hence structured in these levels.

Figure 1: Conceptual framework



Source: Own illustration.

2.1 Process and product innovation at company level

At company level, digitalisation has two dimensions. First, digitalisation means the transformation of value creation processes and accompanying management and administrative processes with the help of digital tools and digital technologies, in other words digitalisation is a form of process innovations. The degree of digitalisation in this dimension could be measured by the extent and sophistication to which tools and technologies are used.

In order to deploy sophisticated tools and technology, expertise is necessary. Process innovation includes human resources dedicated to digital transformation. The state of digitalisation could be measured by organisational measures taken to address the interdependencies of technological and human capital. Internal digital units and internal digital coordinators are signs of an advanced digitalisation process. A digital strategy is an indication that top management assigns high priority to digitalisation, goals are formulated and measures planned accordingly.

[5] See e.g. Johnson, Whittington, Scholes et. al.(2017) pp.118, Schreyögg and Koch (2014), pp.77.

The second dimension at company level is the perspective of product innovation. Digitalisation here means the development of digital products and digital business models: As a supplement to existing products, as a disruptive destruction of established business models or as the opening up of completely new product and service universes for needs and requirements that could not be served before. Looking at product innovation, the progress of digitalisation of the business sector could be surveyed by analysing the scale and scope of product and business model innovations.

2.2 Competitive environment

In the course of the digital transformation of the economy, markets and market structures are changing and new market entrants are challenging incumbent firms. Companies from outside the sector are entering the market and challenging the established companies in the sectors. Companies from the ICT sector in particular are in a position to compete with established companies in the more traditional industries as the digitalisation of products and virtualisation of processes and value chains progress.

In addition, previously valid economic principles such as economies of scale and minimal efficient company size are being overridden. In software development, for example, hardware capacities for digital production are now scalable in real time; there is virtually no fixed cost degression for hardware production capacities, only personnel costs represent fixed costs. This means that small software providers can suddenly compete on a level playing field with large multinationals.

Finally, transport costs for digital products are falling towards zero, which is why the barriers to entering international markets are falling. Therefore, digitalised companies can compete on an international level, but are also exposed to direct, indirect and potential competition from abroad.

To sum up, the digital transformation means increasing competitive pressure, not only from existing market participants, but also from indirect and potential competitors from other sectors and global markets. The status of the digital transformation can be assessed by the managers' perception of competitive pressure, whereby increased perceived competitive pressure is indicative of an advanced digital transformation of the respective market.

2.3 Macro environment

In the standard theoretical framework of strategic management, the macro environment includes:

- The political and legal environment
- The macroeconomic and financial environment
- The socio-cultural environment
- The technological environment
- The geographic, ecological and natural resource environment

Regarding the digital transformation challenge, the most crucial aspect of the macro environment of companies is, whether it facilitates or hinders innovation, progress and necessary adjustments at company level:

- Are job candidates with relevant skills to advance digitalisation available on the labour market,
- Is the legal environment of a country permitting new digital business models in different markets,
- Can companies simplify interactions with the government by using electronic means of communicating?

2.4 Implementation in our study

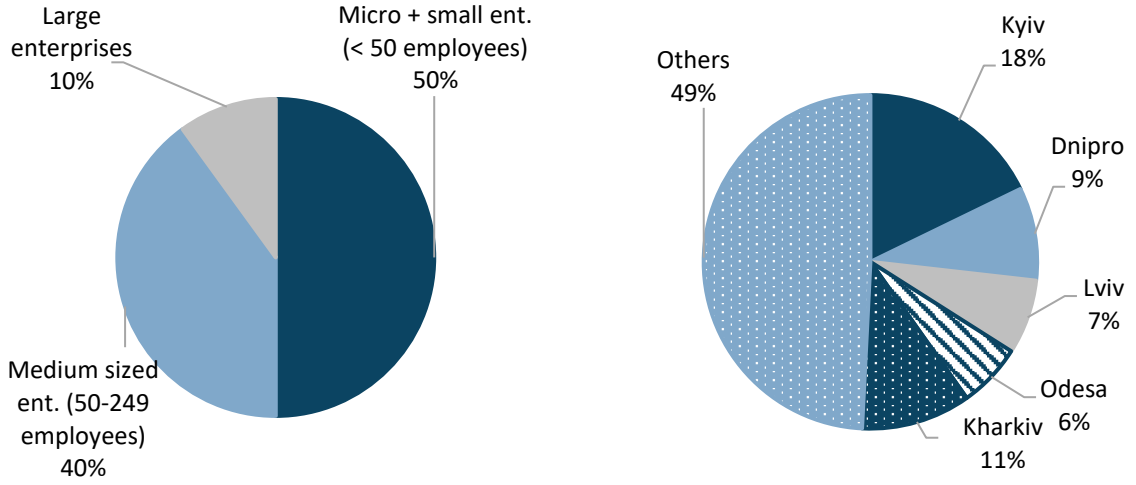
In our study, we use this framework as follows: We first look at the competitive environment by asking questions about the perceived competitive pressures on companies due to increasing digital transformation of markets and their competitors. We then analyse the company level itself: What have businesses done so far to adapt to the challenges and to innovate. From this analysis we gain an insight into the state of digital transformation in Ukraine. Finally, we look at the macro level by asking business leaders about obstacles to digitalisation to understand what can be done to speed up the digital transformation of companies in Ukraine.

3 Survey design, methodology and sample characteristics

Our analysis focuses on the perceptions and decisions of business owners and top managers. We asked decision-makers in companies about their attitudes towards digitalisation, their perceptions of opportunities and threats, their strategy and decisions regarding digital transformation, and their perceptions of impediments to digitalisation.

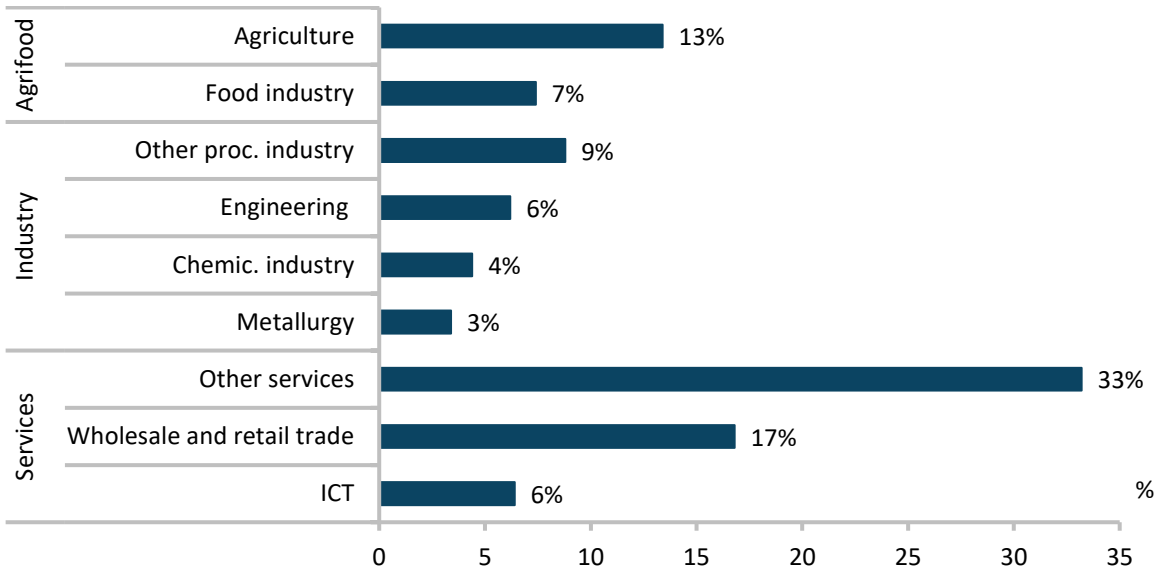
We implemented this approach by conducting a representative business survey. The survey was answered by a sample of 500 companies, hence making this a representative study of the Ukrainian business sector. The sample includes companies of all sizes - micro, small and medium-sized enterprises as well as large enterprises - from all sectors and all regions of Ukraine, as figure 2 and figure 3 illustrate as well as companies with both Ukrainian and foreign capital. In each of the 500 companies, we interviewed either the owners or managing directors or, in the case of large companies, top managers or high-ranking executives. All interviews took place in May and June 2021, were all personal via telephone and lasted around 30 minutes. The sample size and methodology satisfy international scientific standards, making the results highly relevant for policy makers.

Figure 2: Structure of the sample by size and region



Source: Own survey.

Figure 3: Structure of the sample by sector



Source: Own survey.

The sample size and distribution allows us to make comparisons between company sizes and different regions, especially between urban centres (which together make up roughly half of the sample population) and more peripheral regions of Ukraine. Sectoral breakdowns are not fully representative due to somewhat smaller numbers of cases from individual industries. Hence, such results need to be taken with a bit more care, but comparisons between the main sectors (agriculture, industry and services) are easily possible.

Several similar studies allow us to benchmark the results of our survey in Ukraine with the status-quo of digital transformation of the business sector in other countries. Especially, a German study is quite similar with respect to scope and partly with respect to the questionnaire.[6]

[6] Bitkom Research (2020a), Link. Bitkom Research (2020b), Link.

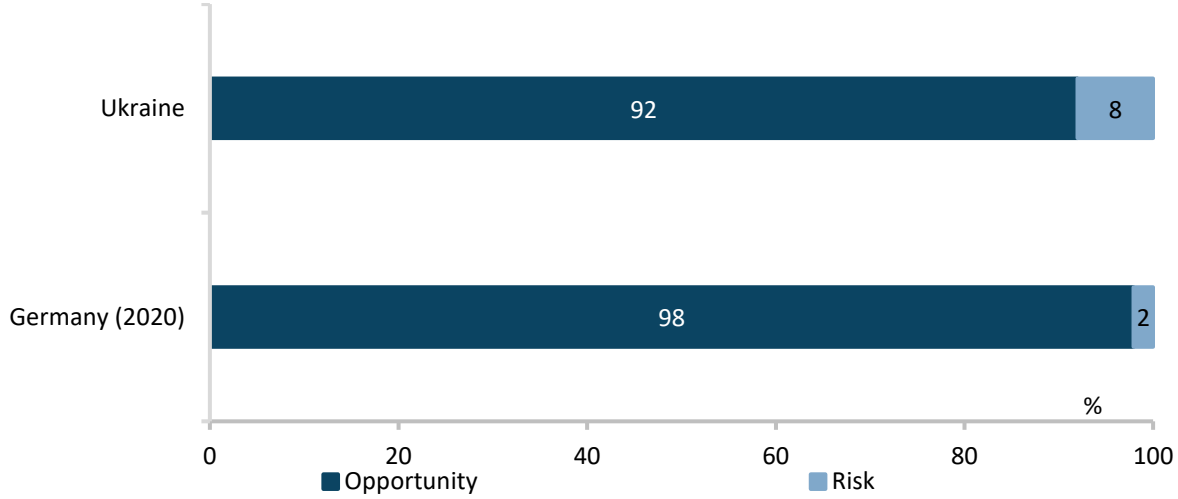
4 The digitalisation challenge in the competitive environment

In the first step of our analysis, we analyse and interpret results from survey questions falling into the level of the competitive environment. What we want to find our here, is what pressure already exists on Ukrainian companies to transform and embrace digitalisation. We begin by asking questions on sentiment and self-evaluation: Is digitalisation perceived as a risk or an opportunity, how do companies assess their progress in comparison to their competitors? We then turn to asking what concrete developments are being observed from competitors of companies.

4.1 Sentiment

Ukrainian companies are in general positive and optimistic about digitalisation, similar to German companies. In response to the question "How do you assess the digital transformation of your company: more of an opportunity or more of a risk?", 92% of the executives interviewed answered "opportunity" and only 8% "risk", as figure 4 illustrates.

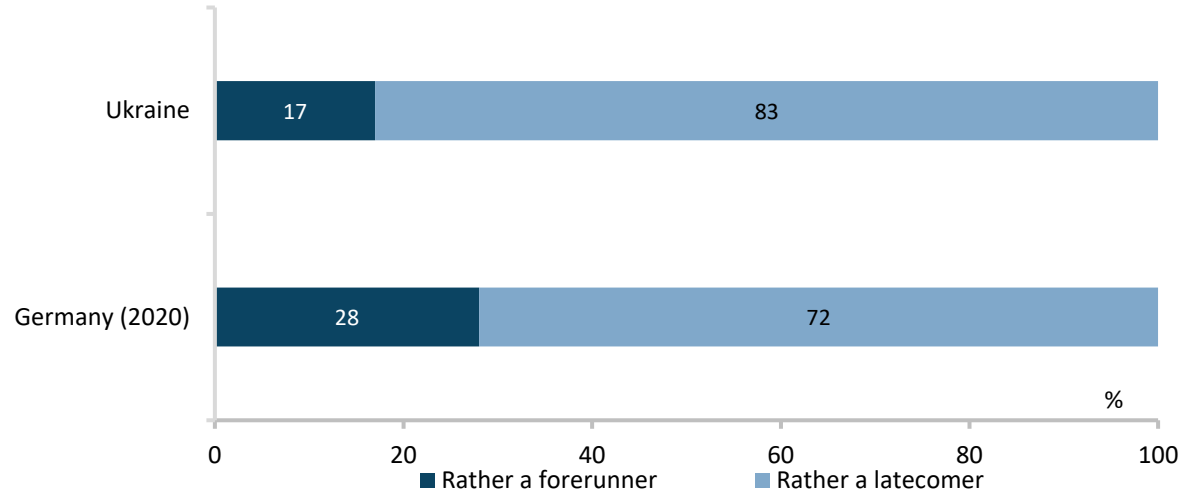
Figure 4: Do you see the digital transformation more as an opportunity or more as a risk for your company?



Source: Own survey, Bitkom Research (2020a).

When asked about their perception of their own market position relative to competitors, less than a fifth of the Ukrainian companies see themselves as forerunners in terms of digital transformation. This is significantly less than in Germany; where 28 % see themselves as forerunners. Against the background that Germany ranks in the top 10% in most international rankings, the proportion of forerunners in Germany still appears small. It should be noted, however, that the comparison is not as straightforward as figure 5 perhaps suggests as companies compare themselves against domestic and international competition. Hence, on the one hand, it is clear that in a representative survey, not all companies can be forerunners and it would be unlikely if all identified themselves as such. On the other hand, international competition is likely much stronger in Germany than Ukraine as the large German market is more attractive for global tech leaders to enter and many export-oriented German companies compete in global high-tech markets.

Figure 5: Where do you see your company in general in terms of the digital transformation?



Source: Own survey, Bitkom Research (2020a).

The breakdown by enterprise size reveals that the majority of companies across all sizes in Ukraine have a similarly positive view of the future opportunities of digitalisation, as figure 6 shows, with one exception: relatively more companies among small enterprises see digitalisation as a risk rather than an opportunity, compared to micro, medium and large enterprises.

Strikingly, the firms size makes almost no difference with respect to the perceived market position in Ukraine. Large companies see themselves slightly ahead, but the gap is neglectable, as figure 7 shows.

Figure 6: Do you see digitalisation rather as an opportunity or as an risk?

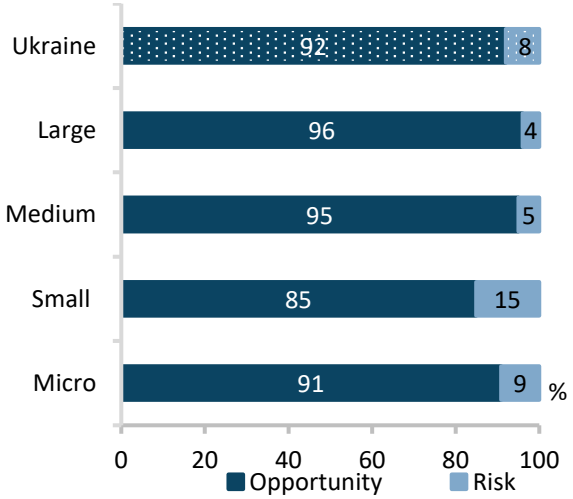
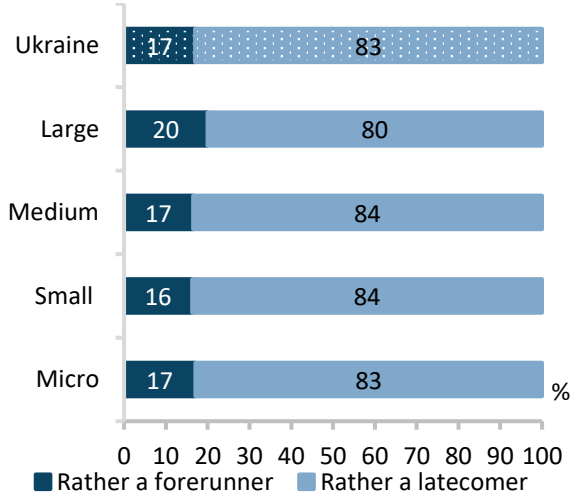


Figure 7: Where do you see your company in general in terms of the digital transformation?



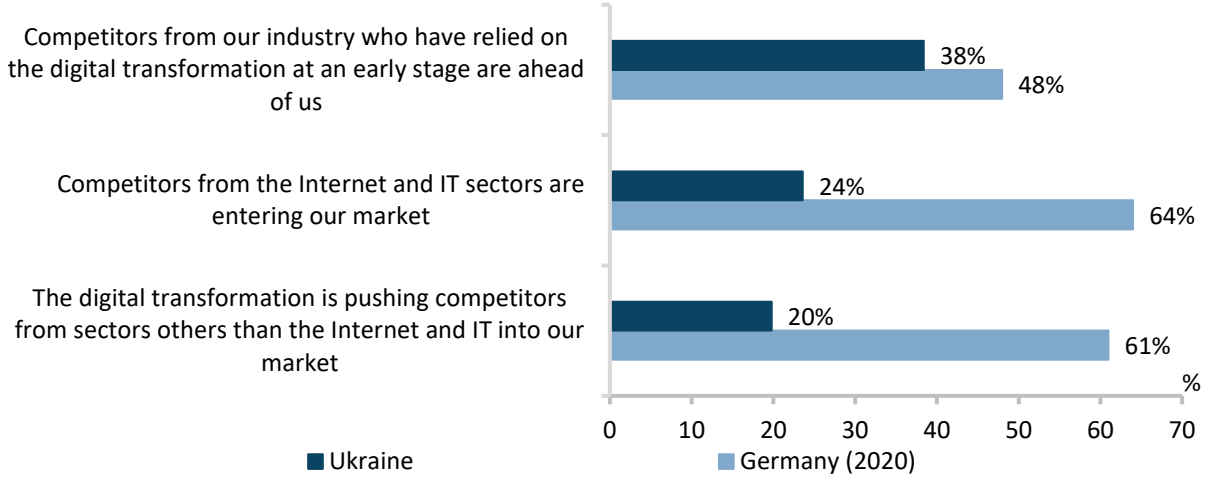
Source: Own survey.

4.2 Market dynamics

In the next step, we asked Ukrainian business executives about their perceptions of the market dynamics and the market position of their company (figure 8). Apparently, pressure arises mainly from "old competitors" in the respective markets. Companies who have embraced digital transformation at

an early stage are evaluated to now have better market positions. Remarkably, new market entries play only a minor role in the perception of Ukrainian business leaders. Only 24% reported new market entries from ICT sector and only 20% report competition from other sectors in their home market.

Figure 8: Which statements apply to your company regarding digital transformation?



Source: Own survey, Bitkom Research (2020a).

This picture of market dynamics as perceived by Ukrainian company executives contrasts quite sharply with the perception of market dynamics by German business leaders. German companies see substantially more competition arising due to a shift in market domains, reporting a strong increase in competition from previously separate sectors and markets – both from IT companies moving into previously non-IT markets and companies from other markets moving into their markets as a result of digital transformation.

These latter developments, which so far appear to take place only at limited scale in Ukraine, are likely among the most challenging aspects of digital transformation as they imply deep changes in markets and value chains: If, say, customers no longer purchase a car but rather buy a “mobility service” or even get such as service for free due to advertising being displayed during their ride in an autonomously driving car, this represents a fundamental change of market dynamics in the transport sector. Companies not adjusting their business models and company structure would risk losing even previously dominant market positions.

4.3 Assessment

Does the lower reported competitive pressure in Ukraine, with most pressure arising from the pressure within established market domains, hence imply that the need for digital transformation in Ukraine is lower? We would argue the opposite: In our view, competitive pressures on the digital transformation of Ukrainian companies will rise substantially in the coming years.

The main reason for this is that the competitive pressure from global players in Ukraine is lower compared to Germany. Ukrainian companies are on average not as integrated into global markets as German companies and the domestic Ukrainian market is, due to its limited size, not as attractive for international companies to move into as the German market. However, with digital transformation penetrating ever deeper in future, this competition will arise for Ukraine as well. Hence, the results

probably only indicate a delayed impact on these pressures on Ukraine – but it will come. It appears that the awareness of Ukrainian business of the enormous challenges posed by digital transformation now and in the near future should probably be strengthened.

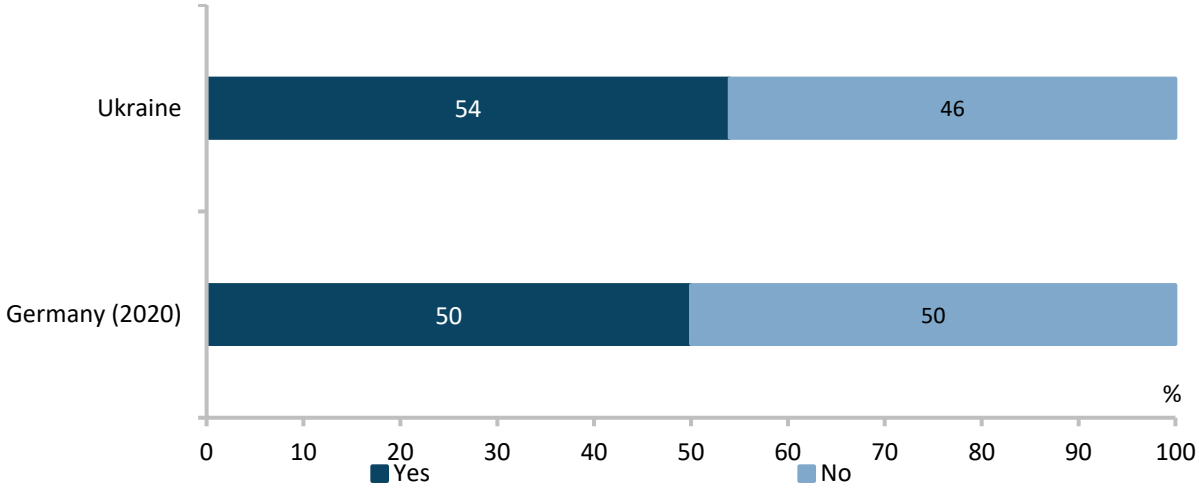
5 The state of digital transformation at company level

In this chapter, we analyse the state of the digital transformation of companies, their reactions to perceived challenges and business leaders' expectations for the future. We first consider the domain of process innovations (the "input side" of companies, how they organise themselves and their production processes) and then consider the domain of product innovations (the "output side": What products do companies offer on markets).

5.1 Process innovation

As figure 9 shows, more than half of Ukrainian companies have made specific investments in their digitalisation in the last two years. A correlation analysis reveals that there is a clear connection between willingness to invest and general assessment: Companies that have invested in digitalisation see digitalisation as an opportunity. Companies that have not invested see it as a risk.

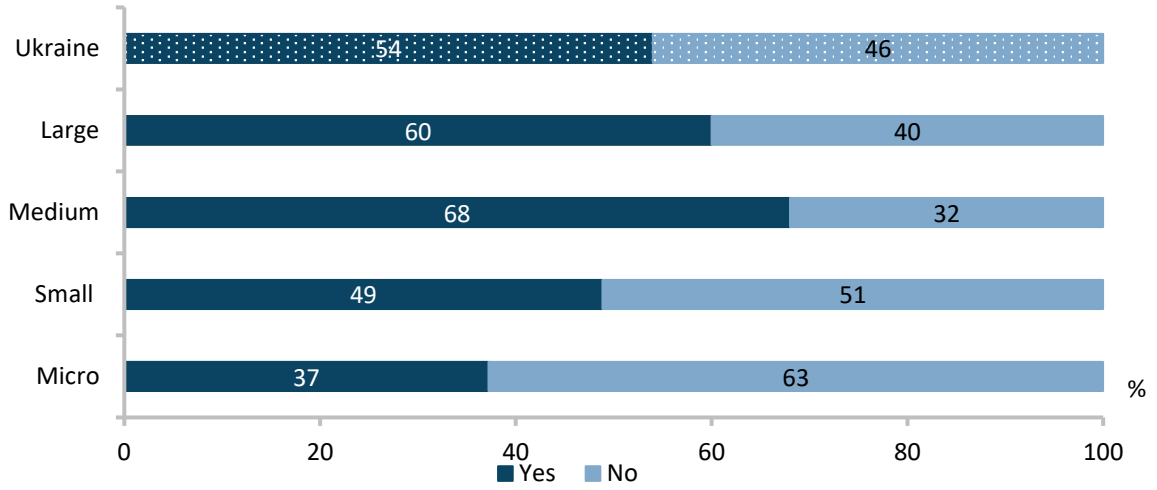
Figure 9: Has your company invested specifically in the digital transformation in the last two years?



Source: Own survey, Bitkom Research (2020a).

At first glance, it seems that the share of companies that have invested in digitalisation is even higher in Ukraine than in Germany. However, the German survey was conducted in April 2020, at the beginning of the pandemic, while the Ukrainian survey was conducted in May/June 2021. The pandemic was a driver for digitalisation projects in many companies. Therefore, recent investment behaviour of German companies is likely higher than figure 9 suggests. Also, the survey data does not allow conclusions on the extent of the investment.

Figure 10: Has your company invested specifically in the digital transformation in the last two years?



Source: Own survey.

It is striking that medium-sized companies are the most active investors in Ukraine, as figure 10 clearly shows. More than two thirds of medium-sized enterprises reported that they have made specific investment in digitalisation in the last two years in Ukraine.

On the contrast, only about one third of micro enterprises reported recent investment. Micro enterprises have generally suffered the most from the pandemic because they usually have the least reserves for crises. At the same time, the managers of micro enterprises interviewed are similarly optimistic about the future as the managers of small, medium-sized and large enterprises. It is therefore to be expected that micro enterprises will try to catch up in terms of investments as the pandemic fades away[7], provided a sufficient access to finance (more on obstacles to digitalisation in section 7).

What however is astonishing is that 40% of large enterprises have not invested in digitalisation in the last two years. Especially large companies are usually expected to have substantial resources and the best access to capital compared to smaller companies. Although the speed of digital transformation in such companies could be lower than in smaller ones due to size-related inertia (it can be very difficult to change often highly complex processes in larger companies), they should be able and willing to commit resources to adapting to what is clearly a global megatrend.

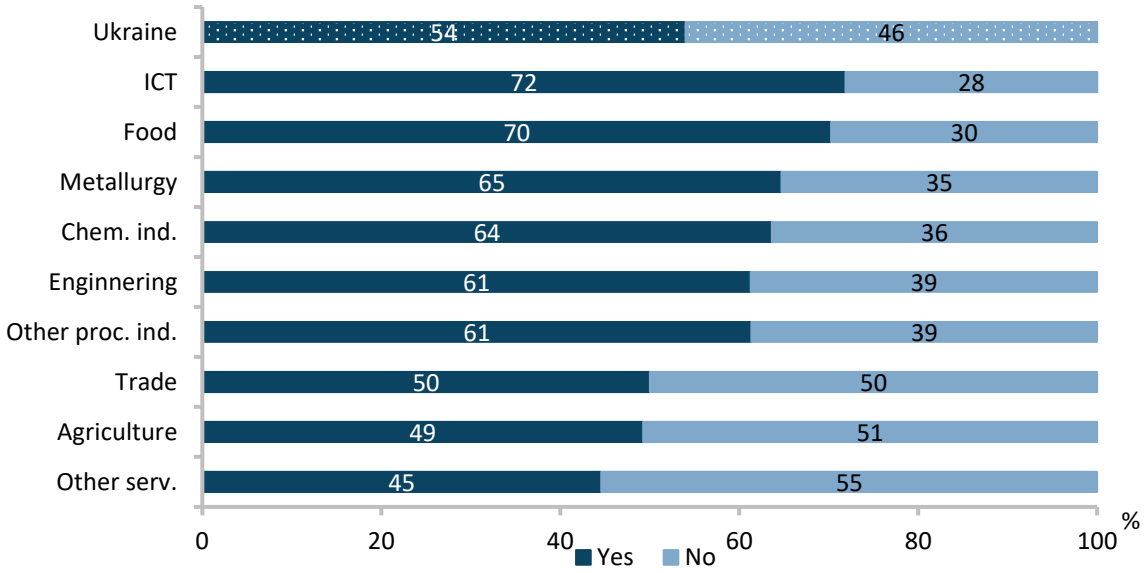
There are differences across the industries regarding investment activity. Ukrainian companies in the ICT and manufacturing sectors appear to be most active in digital-related investment. This result is consistent with developments in other countries: A recent survey of the European Investment Bank sees the manufacturing sector as a frontrunner in the EU and UK.[8] In Germany, for example, mechanical and plant engineering and related industries are among the forerunners in digitalisation, along with the ICT sector.[9]

[7] One limitation of the survey should be noted in this argument: there is a so-called survival bias in the data, meaning that only micro and small businesses that have survived the pandemic are included in the data.

[8] EIB (2021), Link.

[9] Tata Consultancy Services and Bitkom Research (2021), Link.

Figure 11: Has your company invested specifically in the digital transformation in the last two years? By industry



Source: Own survey.

However, the share of investing companies in the agricultural and non-IT service sectors lags behind in Ukraine. This is not necessarily intuitive: Ukraine is a good location for the development of digital agricultural technologies. Its advantages include the large agricultural resources, the strong IT sector and the existence of financially strong agricultural holding companies.[10] However, other studies also conclude that, despite some examples, the Ukrainian agricultural sector as a whole is lagging behind the potential of digitalisation. For example, experts point out that in the USA, 80% of American farmers use elements of precision agriculture, whereas this figure is ten times lower in Ukraine.[11] Also, the food industry (i.e. the manufacturing part of the agri-food complex) sector is among the frontrunners in digital investment in Ukraine.

It is also surprising that the non-IT services sector (trade and other service activities) is one of the laggards in digital investment. While this could also have to do with the composition of our sample, in Germany, for example, the retail sector has now overtaken all other sectors (except ICT) in terms of digitalisation.[12] Regardless of questions of sampling and statistical significance, it is apparent that the service sector still has untapped potential in digitalisation in Ukraine.

Looking at the tools and technologies currently used by Ukrainian companies, a picture emerges that also corresponds to the observations of a comprehensive OECD study: On the path to digital transformation, companies tend to digitise general administrative and marketing processes as a first step, which includes interactions between companies and public authorities and the use of electronic invoices. The digitalisation and virtualisation of production processes are further, more advanced and more complex stages of the digital transformation.[13]

[10] GTAI (2021), Link.

[11] Nemitz, F. (2021), Link.

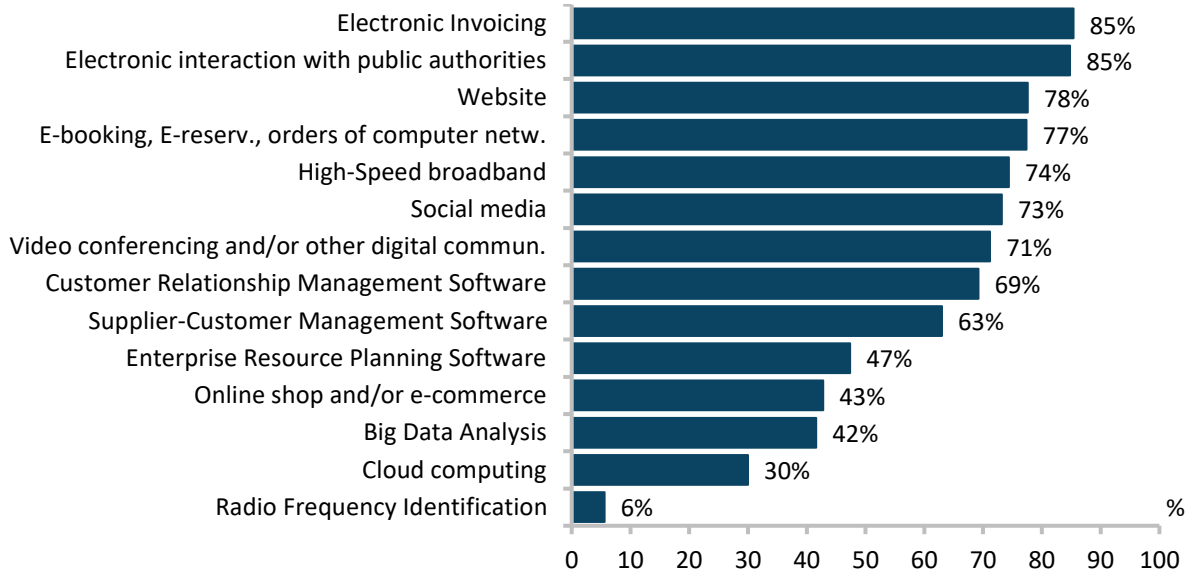
[12] Tata Consultancy Services and BitKom Research (2021).

[13] OECD (2021), p. 24, Link.

On this trajectory, companies in Ukraine are still in the early stages of digital transformation. Adoption rates are higher for simple tools and low-entry digitisation technologies, but even for entry-level technologies, adoption rates are remarkably low compared to international standards: More than one fifth of Ukrainian companies do not even use a website.

The correlation between adoption rate and technological maturity is very clear in figure 12: The descending order of adoption rates corresponds exactly to the ascending order of sophistication of digital tools. Electronic invoicing is the most simple technology and Radio Frequency Identification (RFID) the most advanced in this chart. At the same time, it must be said that - perhaps with the exception of RFID - none of the tools presented belong to high technologies. Cloud computing, for example, is nowadays considered standard rather than high-tech. And yet only 30% of Ukrainian companies report using cloud computing.

Figure 12: What digital tools and technologies does your company already use?

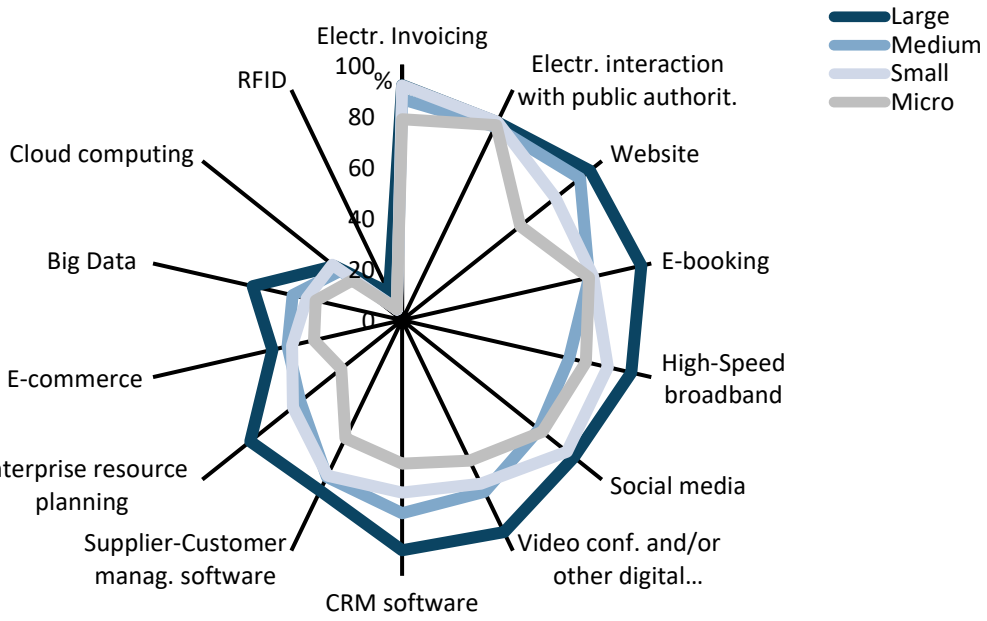


Source: Own survey.

A slightly different picture emerges if a distinction is made according to company size. Figure 13 demonstrates significant differences between SMEs on the one hand and large enterprises on the other in terms of the use of digital tools and technologies. However, even in the group of large companies, only 34% reported that their company uses cloud computing. In Germany, for example, 94% of big companies use cloud computing.[14]

[14] Tata Consulting Services and BitKom Research (2021); 89% of enterprise with 100 and more employees uses cloud computing.

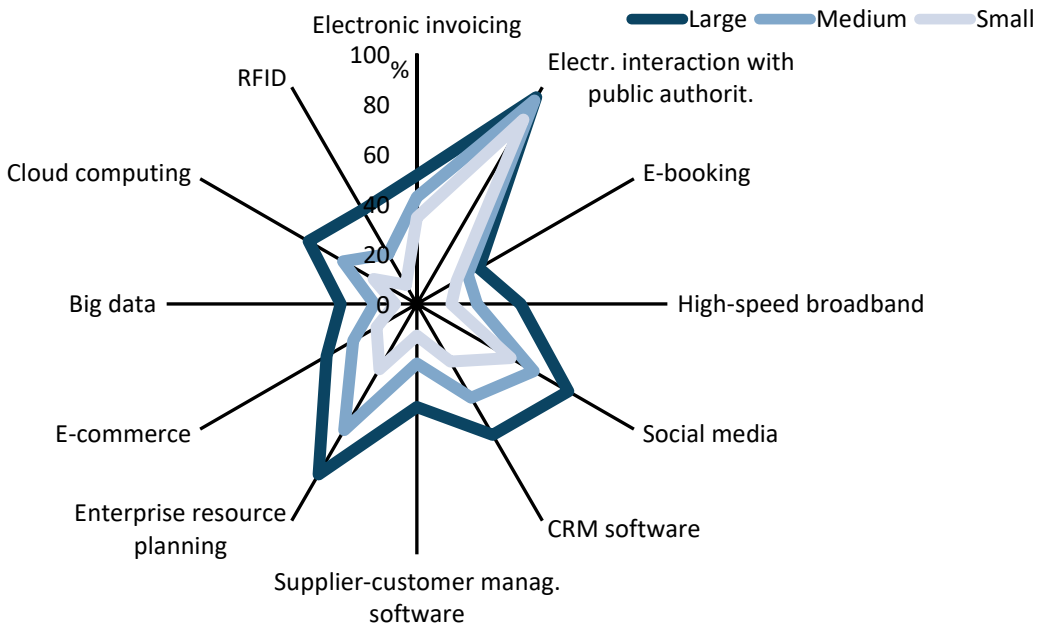
Figure 13: What digital tools and technologies does your company already use? By firm size



Source: Own survey.

The results are consistent with a recent comprehensive OECD study, as figure 14 shows. The technology adoption rates in the OECD chart are smaller in absolute terms, which is due to different data collection periods and techniques. Furthermore, the categories differ slightly. Nevertheless, the same trends emerges: Firstly, adoption rates decrease as technology and instruments become more sophisticated, Secondly, adoption rates decease with the size of the company. [15]

Figure 14: Which digital tools and technologies are used by companies: OECD

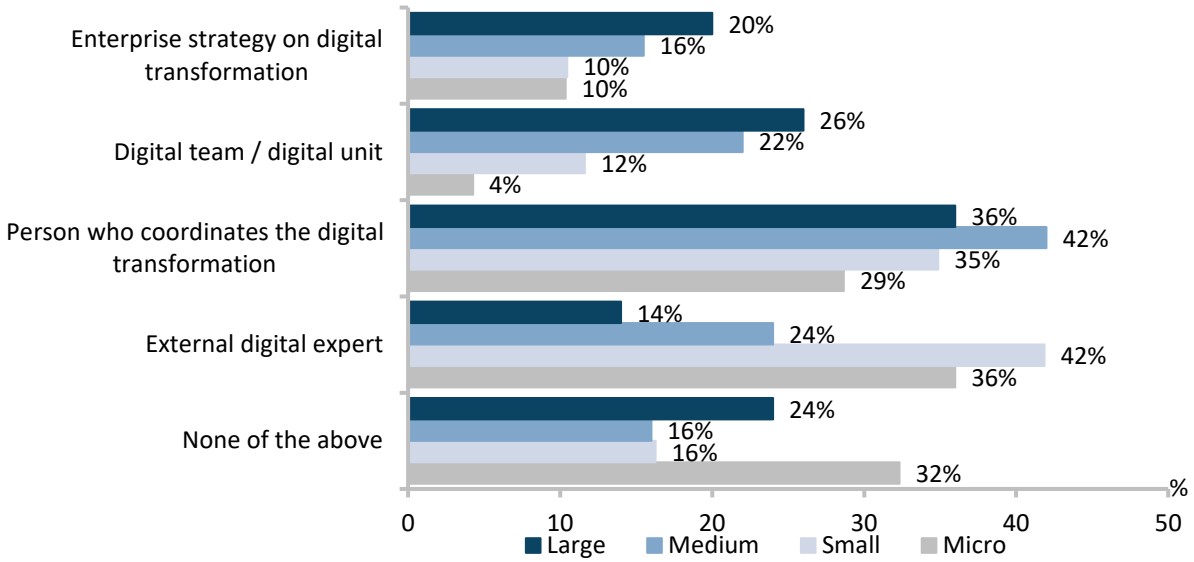


Source: OECD (2021).

[15] OECD (2021).

Apart from technology use, a crucial process dimension is the question what organisational measures have been taken with regard to the digital transformation. Engaging an external digital expert is a low-threshold measure, as no restructuring of the organisation is required. It could be regarded as a first step towards digital transformation from the organisational perspective. The appointment of a person responsible for coordinating the digitisation measures is a further step because internal resources will be build up. A digital team or department shows that management is providing adequate resources for digitalisation. A corporate strategy for digital transformation proves that management is truly committed to digitalisation.

Figure 15: Which of the following organizational measures for the digital transformation have you already taken?



Source: Own survey.

In Ukraine, only one fifth of large enterprises have a digital strategy. In the SME sector, this proportion is even lower. In comparison, 38% of companies[16] in Germany have a central digitalisation strategy and further 39% have a digitalisation strategy for company divisions.[17] Micro and small enterprises rely mainly on external digital experts, which reflects their limited resources. In contrast, medium and large enterprises should be able to allocate adequate human resources to digitalisation. However, only 26% of large enterprises and 22% of medium-sized enterprises in Ukraine have set up a digital unit or a digital team. This is much less than in Germany, for example, where 41% of large and medium-sized companies[18] have a digital unit.[19]

In Ukraine, 36% of large companies and 42% of medium-sized companies have appointed at least one person to coordinate the digital transformation, which is again lower than in Germany, where 56% of

[16] 20 employees or more.

[17] Bitkom Research (2020a).

[18] 100 employees and more.

[19] Tata Consultancy Services and Bitkom Research (2021).

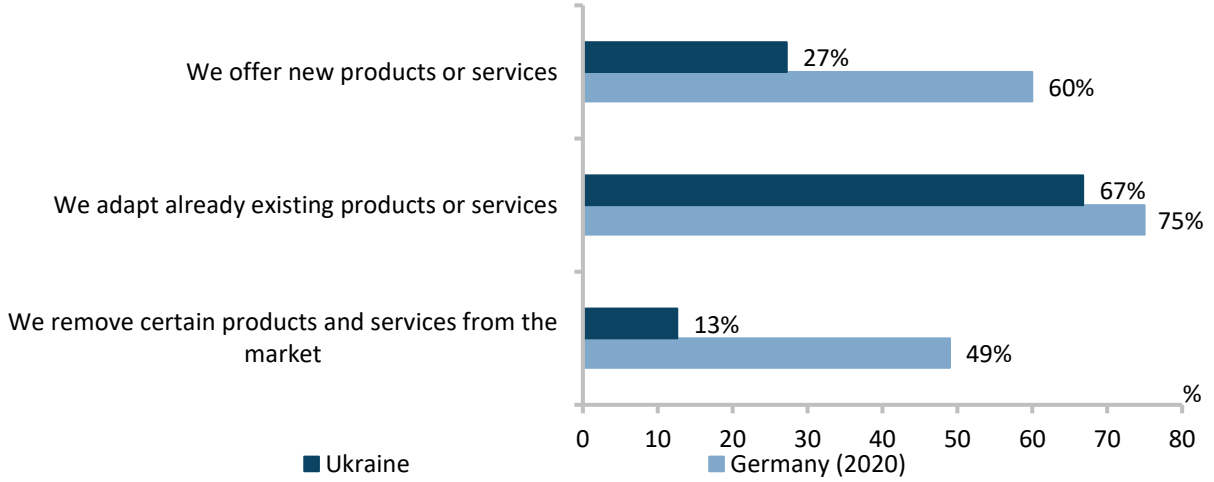
large and medium-sized companies have an internal digital coordinator.[20] Worryingly, almost a quarter of the large companies stated that they do not employ or commission any digitalisation experts at all.

Correlation analysis between the question reveals that companies with clear internal responsibility for driving digital transformation (internal digitalisation coordinators and/or digital units/teams) were more likely to invest in digitalisation in the last two years (see figure 10). Organisational measures and progress on investment and technological assets are interrelated. Companies lagging in their efforts probably need to first assign internal responsibility and build up competence in order to invest and make substantial progress with the uptake of new, digital technologies and methods.

5.2 Product innovation

On the output side, the majority of Ukrainian companies have already reacted to digitalisation. However, most appear to have taken a rather incremental approach so far. 67% report that they have adapted existing products. Only 27% of companies report that they offer new products as result of their digital transformation effort. And only 13% removed products from their portfolio.

Figure 16: Which statements apply to your company? As a result of the digital transformation...

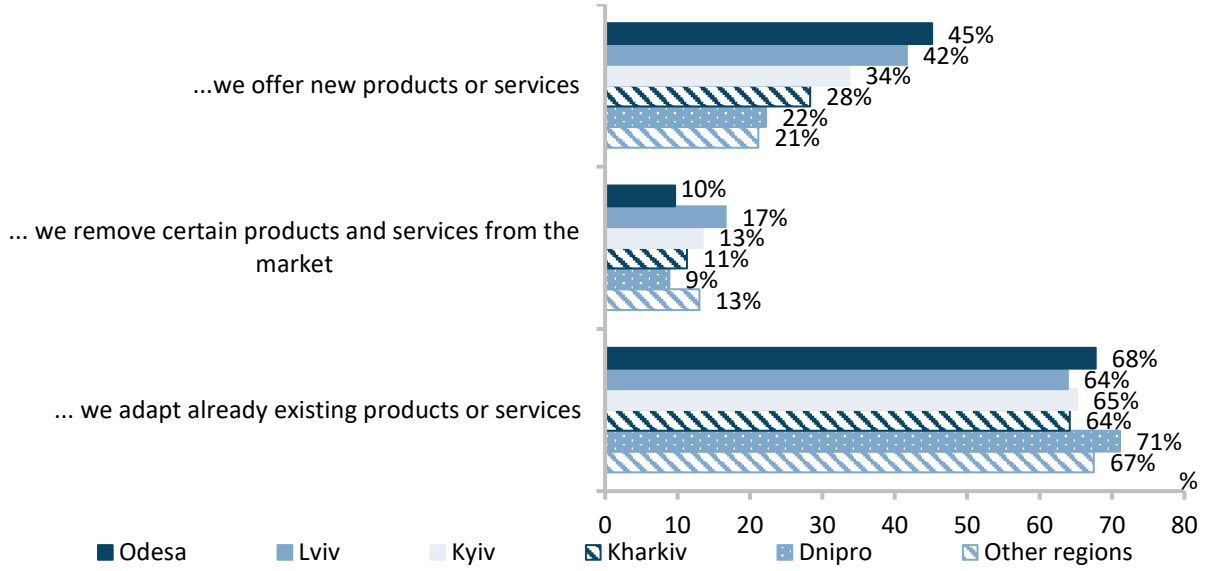


Source: Own survey, Bitkom Research (2020a).

Strong differences are visible between the innovation activity of Ukrainian and German companies in terms of reactions on their product portfolio. A far higher share of German companies (60%) has started offering new products or removed products from the market as a result of digital transformation dynamics. Interestingly, this links back to the observation of far more broad-based competitive pressures on German companies made in chapter 4. More pressure will require more substantial and deep reactions by companies. If pressures are so far limited in Ukraine, this explains the rather incremental steps taken on adapting the output side of companies.

[20] Bitkom (2020a).

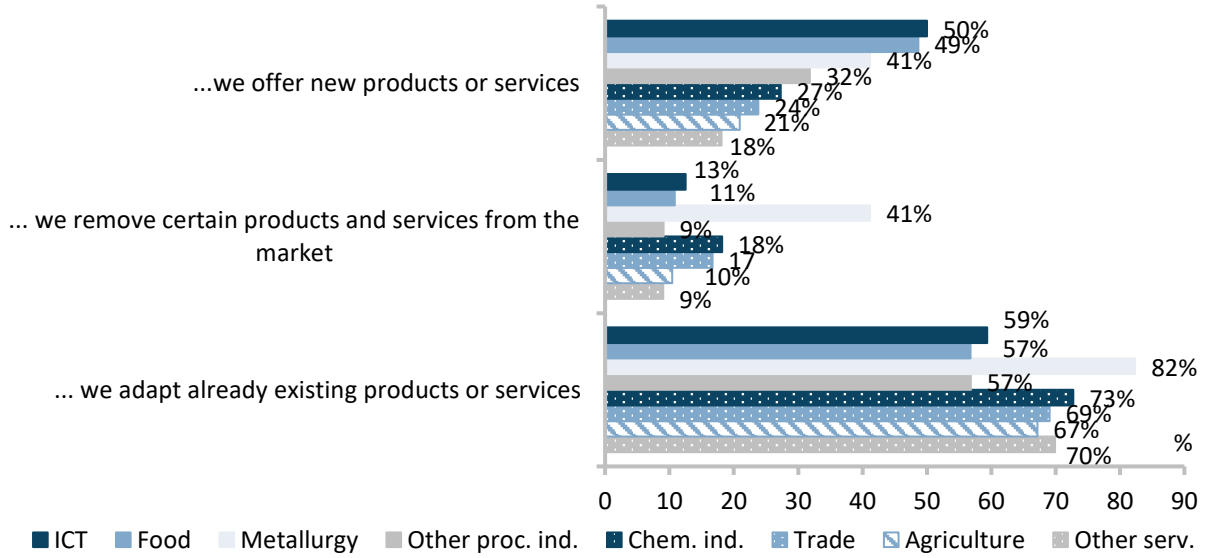
Figure 17: As a result of the digital transformation... By region



Source: Own survey.

Some regional differences are present here: Companies in Odesa, Lviv and Kyiv report more new product or service offerings as a result of digitalisation than companies from other regions of Ukraine and generally the urban centres report more innovation in this regard than the less urban regions grouped into "Other regions" (see figure 17). These differences between regions are not fully statistically robust, but deserve to be explored in more detail in future analyses. A reason might be found in the company structure of these oblasts – perhaps companies in markets where most pressures towards digital transformation exists are concentrated in these regions, or indeed these regions may boast a more innovative ecosystem that brings about more innovation than in other regions.

Figure 18: Which statements apply to your company? As a result of the digital transformation... By industry



Source: Own survey.

Similar differences across industries also appear. Apart from the ICT sector, again the food industry, metallurgy and other manufacturing sectors lead with regard to having reported new product and

service offerings. Agriculture and the non-IT service activities again appear to lag behind. While it is understandable that few reactions on the output portfolio of agricultural companies may be required as a response to digital transformation, this is less understandable for the service sector: In many cases, digital product innovations are possible and promising in services – and less cost-intensive to implement than in industry.

5.3 Assessment

Many Ukrainian companies reported to have already taken measures to respond to the challenge and opportunity of digital transformation. More than half have invested into digitalisation measures in the past two years and most companies have made changes to their portfolio of products or services offered on the market. However, consistent with yet limited pressure to transform (see chapter 4), overall reactions are still rather on the incremental side and significant shares of companies appear to have done little to nothing so far. If, as we assume, pressures on the market will keep increasing in the coming years, companies need to prepare to do more. Domestic and foreign disruptors will discover the yet unexploited potential for new products and more efficient processes on the Ukrainian market. Whilst this will benefit Ukrainian consumers, existing companies need to prepare for more pervasive changes and drive their own digital transformation processes more strongly.

6 Company views on obstacles to digitalization

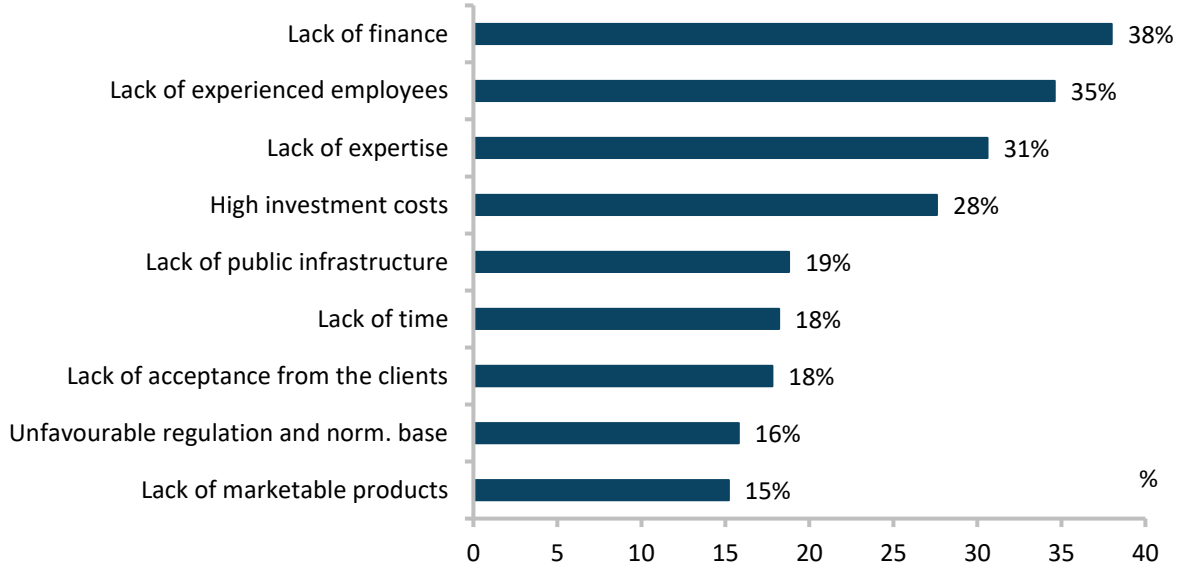
If Ukrainian businesses need to undergo more and deeper digital transformation in future, it is important to understand, what may hold them back. Companies reported most problems with regard to digital transformation in two distinct areas: Finance and expertise/skills.

The first area contains the answers directly related to finance, but also those on investment costs. That this domain is prominent is not surprising. Access to finance is a problem affecting Ukrainian companies in general. Despite comprehensive and successful reforms of the banking sector in the past years, interest rates remain high in Ukraine (as underlying risks in Ukraine are unfortunately higher than in e.g. EU markets). Access to credit also is often hard in general and only relatively short-term credits are available, making it hard to finance more substantial long-term investments.

The second area is somewhat more surprising. The lack of experienced staff and the lack of expertise were mentioned as second and third place. As Ukraine is a country with a strong IT sector, a shortage of skilled staff is somewhat surprising at first glance, but is more understandable at a deeper look. The IT sector might absorb most talent on the labour market by offering substantially higher-than-average salaries than other sectors.[21] Also, with its high focus on service exports from outsourcing and other export-oriented companies, the linkage of the IT sector with the rest of the Ukrainian economy is so far limited. At the same time, substantial demand for digital skills should give rise to a market, e.g. for related consulting activities. As this has not emerged in large scale so far could be due to inadequate abilities or willingness to pay for such services.

[21] GET (2021a).

Figure 19: What do you see as the biggest obstacles to the digital transformation of your company?



Source: Own survey.

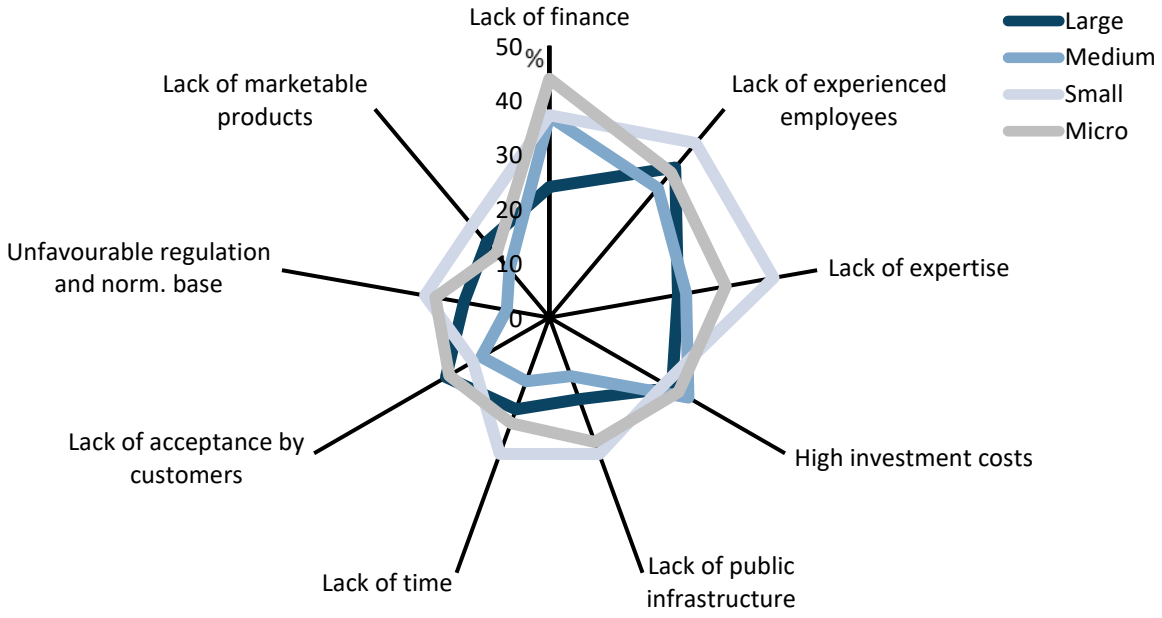
Deficiencies in public infrastructure provision or regulation only came behind these two areas. When managers mentioned "lack of public infrastructure" and/or "unfavourable regulations and normative bases" as obstacles, the interviewers asked for more detailed explanations. Among the more detailed explanations, the following points were mentioned most frequently:

- Poor internet access in rural areas
- Inefficient digital interaction with authorities
- Problems with the regulation of digital intellectual property rights

Again, reported obstacles differed in their intensity by company size. Medium-sized enterprises complained least about external obstacles, with the exception of lack of financial resources. To some extent, it can be inferred that these are the most dynamic companies in Ukraine and find solutions where other companies find it harder to surmount obstacles.

Large companies complained substantially less than all others about a lack of finance. That is generally plausible (they are generally to be expected to have better access to finance due to size and developed relationships with banks and the capital market) but in contrast with fewer large than medium companies reporting investment in the previous two years (see figure 10).

Figure 20: Reported obstacles to the digital transformation of the company - by company size



Source: Own survey.

According to our findings, there are differences regarding the perception of obstacles across regions. While the managers of businesses located in Kyiv report nearly the same obstacles as the average, two regions stand out because the answers of the interviewed business leaders differ most from the average: Lviv and Odessa. Businesses in Odessa mentioned the lack of expertise more rarely than other regions, while businesses in Lviv appear to experience less issues with regard to lack of financial resources. Due to the sample size, these results at regional level are not statistically robust but could be investigated in future analyses.

7 Policy implications

Ukrainian businesses are optimistic about digitalisation. Many have undertaken measures both with regard to internal organisation and processes as well as with regard to their product or service portfolio. Nevertheless, progress so far appears limited: Many companies have only undertaken limited transformation activities and it is likely that a significant share of companies has still done little or nothing. Interestingly, this also includes a significant share of large companies that appear to struggle more than the more dynamic medium-sized companies. As competitive pressures on the Ukrainian market are set to increase in future years, more activity and more pervasive transformation will be required across the spectrum of Ukrainian companies.

In the following, we derive some policy recommendations from the results of this survey, addressing the obstacles, gaps and deficiencies identified in the previous chapters that can be addressed by policy. All of the listed measures will of course require careful design and deeper consideration of the specific issues during the design stages as the result of this survey is mainly to highlight the areas that need to be addressed. It is also important to highlight that the Ukrainian government is already working on these issues.

Support programmes directed explicitly or implicitly at digital transformation have been deployed, including several programmes under the "Diia" umbrella (especially Diia Digital Literacy directed at skills and Diia Digital state directed at improving regulation and e-government) as well as the "5-7-9" programme for subsidized credit provision to SMEs[22]. These programmes can be further sharpened by incorporating the insights gained from this study as well as further analysis in its wake.

7.1 Policy recommendations

Increasing the available skills base in the economy

The shortage of skilled workers should be addressed on several levels. In the domain of university education, the range of courses and places offered at Ukrainian tertiary educational institutions in the so-called STEM[23] disciplines should be expanded. Also, it could be considered to facilitate studying financially by revising the current system of tuition fees, student financing and scholarships.

Outside academic institutions, the development of a sophisticated market for private providers of on-the-job training and lifelong learning should be facilitated. This includes the development of Ukrainian digital education platforms. Not all IT workers need academic diplomas necessarily, but skills such as network administration or even programming or agile project management can be acquired outside universities. Also, new job profiles related to digital transformation should be considered when revising the system of vocational training.

Targeted support for digital investment

The Ukrainian government is already implementing a comprehensive credit programme since 2020 that is intended to improve access to finance specifically for SMEs. The 5-7-9 loan programme supports SMEs with credit at discounted rates. The access and eligibility conditions of this programme are generally in line with international standard. Nevertheless, it should be evaluated to what extent this support programme is also suitable for promoting digitalisation investments. At first glance, the funding conditions are tailored to traditional production conditions. The focus on the investment of fixed assets, real estate and construction of premises underlines this very clearly. In digital transformations, however, the importance of fixed assets is secondary; it is more about investments in know-how, processes, brands and market shares. The 5-7-9 programme should be reviewed to see whether it takes into account the special investment characteristics of digital transformation.

Some measures can address skills and financial gap simultaneously

There is international experience with policy programmes that address both problems simultaneously. For example, programmes that combine the provision of external digital experts with government funding to pay the digital expert, e.g. in the form of cost sharing. Germany has experience with a programme that subsidises the employment of digital professionals by paying 50% of their salary for a limited period of time by the state. Such programmes could be considered in Ukraine, too.

[22] GET (2021b), forthcoming.

[23] Natural Sciences, Technology, Engineering and Mathematics

Addressing gaps in regulation and e-government facilities

Although government regulation and difficulties in the digital interaction with authorities are further down the list of obstacles, they should be addressed nevertheless. Although reform measures have been undertaken related to improving the digitised exchange of documents between businesses and public authorities, companies are still experiencing obstacles in this regard, which should be identified and addressed. Also, insufficient protection of digital data and intellectual property rights, the regulation of legitimacy of digital documents in general, and the lack of a functioning e-signature facility in particular were highlighted and should be addressed by policy measures.

Improving internet availability in rural regions

The poor availability of internet access in rural areas was mentioned as an obstacle to digital transformation in the periphery. According to our survey results, the difference between Ukraine's main urban centres and the Ukrainian periphery is not too big at the moment. However, as digitalisation accelerates, there is a great risk that rural areas will be left behind due to insufficient digital public infrastructure. Also, digitalisation of agriculture appeared to be progressing slowly – a potential threat for one of the key sectors of the Ukrainian economy that has contributed significantly to economic growth and export in the past years. As with many infrastructure investments, a balance needs to be struck between costs of providing infrastructure in less densely populated areas with lower economic activity and concerns for interregional equity. Hence, investments in improving internet availability across rural regions should be carefully considered.

Strengthening awareness of the need for digital transformation

A fundamental problem that emerges from this survey and that seems to be a decisive brake on action is the lack of awareness of the importance of digitalisation. This seems to be particularly true for large companies, because large companies report significantly less about a lack of financial resources and a lack of know-how and skilled workers. At the moment, competitive pressures towards digitalisation appear to still be limited in Ukraine, but they will grow. Ukrainian companies need to develop greater awareness themselves, and policymakers should support them in this. Ukraine can take advantage of international experience. The German government, for example, has implemented a number of support programmes to raise awareness of digitalisation among companies. One measure that should be highlighted here are digital competence centres. They provide a scientifically based, free-of-charge offer tailored to SMEs and craft enterprises. They provide support through information, demonstration, qualification, conception and assistance in the implementation of companies' digitisation projects.

7.2 Priorities and sequencing

Work should address all identified problem areas, but focus on the skills gap

Policy towards the digital transformation of the business sector should concentrate especially on the lack of expertise and skilled workers, but also address other highlighted obstacles and identified problems. Lack of finance/access to capital is a general problem for Ukrainian companies without an immediate, comprehensive solution. However, in the context of advancing companies' digital transformation, targeted measures towards facilitating digital-related investments can and should be evaluated. Public investment and regulatory measures should also be reviewed and modified to further assist digital transformation. Awareness of companies so far ignoring this issues should also be strengthened.

Support measures should be differentiated by company size

It is striking that medium-sized companies in Ukraine are the most active in investing and the least likely to complain about external obstacles, but suffer more from financial constraints and lack of skilled labour than large companies. It could therefore be advisable to focus government programmes on medium-sized enterprises in these areas, at least in the short run.

Micro and small enterprises also need support, but the digital dividend for the entire Ukrainian economy and society is likely to be smaller than the digital dividend of digitalised medium-sized enterprises. As the digitisation of the Ukrainian economy progresses, the liability of smallness will become less important and small businesses will gain better access to markets and resources as a positive side effect. Programmes for micro and small enterprises should hence follow after those for medium-sized companies have been rolled out.

Large companies appeared to experience fewer obstacles. Their comparative lack of transformation hence indicates a problem with awareness. Measures aimed at large companies should hence focus on strengthening that.

Summary of major policy recommendations

Short term

- Strengthening awareness for the necessity of digital transformation, esp. in large companies
- Review and fix reforms regarding e-government and related reforms (e.g. digital signature)
- Consideration of usefulness of increasing broadband internet coverage
- State support for medium-sized enterprises to access expertise and knowledge
- State financial support for medium-sized enterprises for digital investment
- Start fighting the scarcity of skilled workers by adapting or reforming the education system to train more digital professionals

Medium and long term

- State support for micro and small enterprises to access expertise and knowledge
- State financial support for micro and small enterprises for digital investment

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