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# Digital Challengers in the next normal

Central and Eastern Europe on a path to digitally-led growth

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# Preface

The number of people in Central and Eastern Europe (CEE) who have accessed at least one online service has risen by 15 percent points since the start of the COVID-19 pandemic. At the peak of the pandemic, there were almost 12 million new users of online services—more than the population of Slovakia, Croatia, and Slovenia put together.

The change in customer demand for digital channels witnessed in the last months is unprecedented. The ability of businesses and the public sector to follow their customers and citizens in the digital world and to envision new ways of operating will be crucial to successfully weathering the crisis and ensuring long-term sustainability and growth in the next normal.

In 2018 we published a series of reports on the rise of “Digital Challengers” across Central and Eastern Europe. We defined the economic potential from accelerated digitization in ten countries in the region: Bulgaria, Croatia, the Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. We considered these countries Digital Challengers, as they demonstrate strong potential for growth in the digital economy. We pointed out that robust digitization could act as the next driver of sustainable growth in the region, potentially contributing €200 billion of additional GDP by 2025.

Of course, when we made our recommendations, we did not foresee a pandemic transforming the world.

COVID-19 is a human tragedy, affecting all of our lives. It is also having an increasing impact on the economy and the process of digitization. With this in mind, we decided to revisit our data on Digital Challengers to see how well CEE countries were prepared for the disruption caused by COVID-19, and whether they are now managing to digitize as fast as their populations.

COVID-19 was a tipping point for digital transformations. Not because it significantly altered the solutions, but rather because it amplified the need to implement them fast. This report aims to further strengthen the importance of digitization, explain implications of the COVID-19 pandemic, and put forward recommendations on how digital technologies can fuel faster recovery. It analyzes Digital Challengers’ level of digitization before the pandemic outbreak and showcases acceleration in digital technologies adoption during the first half of 2020. This includes primary research insights from the McKinsey Digital Sentiment survey, which measures the uptake in digital services usage by individuals across CEE during the lockdown. Furthermore, we provide concrete ideas on how policymakers, business leaders and individuals can use digital technologies to build resilience and together contribute to a more sustainable, digitally-led CEE economy.

The ideas we present build on those outlined in the previous reports and articles published by McKinsey & Company and other institutions. We would like to take this opportunity

to thank the authors of the above publications—in particular James Manyika, a senior partner in McKinsey’s San Francisco office; Klemens Hjartar, a senior partner in Copenhagen; and Paul Jenkins, a senior partner in Oslo, for their expertise, inspiration, and guidance.

The work on this report was led by: Tomasz Marciniak, partner; Jurica Novak, McKinsey’s managing partner in Central Europe; Borys Pastusiak, local partner; and Marcin Purta, managing partner in Poland. Significant contributions were made by McKinsey partners across CEE, including: Tomislav Brezinščak in Croatia; Alexandru Filip in Romania; András Havas, Levente Jánoskúti, Daniel Rona in Hungary; Tomáš Karakolev, Helena Šarkanová, and Dan Svoboda in the Czech Republic and Slovakia.

These individuals worked together with a team comprising consultants Ivana Valachovicova, Kamila Kawecka, and Margarita Młodziejewska; communications experts Joanna Iszkowska and Milena Malinowska; graphic designer Małgorzata Leśniewska; and many others.

At the same time, we would also like to thank the many area experts from the public, private, and social sectors who provided insights and source data, and helped advance our thinking. In particular, we would like to acknowledge our collaboration with Google on this research, including contributions of analytical inputs and insights leveraged in this report.









Prague, Czech Republic

# Executive summary

The development of Central and Eastern European economies over the past few decades is truly a remarkable achievement. The ten CEE countries analyzed in this report—Bulgaria, Croatia, the Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia—increased per capita GDP by 115 percent in the period 2004–2019.<sup>1</sup> In 2019, the market openness of these Digital Challengers, as we call them, reached 123 percent<sup>2</sup> and the average unemployment rate across the region was the lowest in recent history, at just 4.6 percent. Productivity increased to €36 per hour worked in 2019 and is catching up with the levels seen in Western Europe.

The success of CEE was largely driven by strong traditional sectors of the economy, dynamic exports, investments from abroad, labor-cost advantages and funding from the European Union (EU). However, many of these engines are now gradually powering down. Moreover, it is clear that CEE is still vastly undercapitalized. With labor capacity at its limit and strong dependence on exports, there is little more that the region can do with its historical growth engines.

## **The pace of digitization increased slightly, but COVID-19 is accelerating changes**

In our 2018 report *The rise of Digital Challengers*, we suggested that

# 12m

new users of online services  
appeared in CEE since the start  
of the COVID-19 pandemic

digitization was the new lever that CEE countries could use to stay on their growth trajectory. Our analysis showed that CEE can gain significant economic benefits from digitization, primarily due to productivity gains. According to our calculations, closing the gap with Western and Northern Europe had the potential to add as much as €200 billion in additional GDP by 2025.<sup>3</sup>

In this report we take the opportunity to assess the progress of CEE countries. With the digital economy reaching €94 billion in 2019, it is clear that CEE exceeded the “business as usual” scenario laid out in the previous report by €2 billion. But it was still €23 billion below the level of the aspirational scenario. This implies that the region has not yet managed to fully leverage digitization of the public and private sectors, and has not yet significantly boosted e-commerce and offline consumer spending on digital equipment.

In 2017–2019, the digital economy in CEE grew by almost eight percent a year, much higher than the pace of change in the largest five economies in Western Europe, or the “Big 5”—France, Germany, Italy, Spain, and the United Kingdom. However, the group we use as a primary reference in our reports—the Digital Frontrunners of Belgium, Denmark, Estonia, Finland, Ireland, Luxembourg, the Netherlands, Norway, and Sweden—managed to grow even faster, widening the gap with CEE even further.

The outbreak of the COVID-19 pandemic has been a global humanitarian crisis that has upended lives and cast a shadow of uncertainty over the future. There is one thing, however, we can be sure about: The world that emerges from the pandemic, or as we call it the next normal, will be more digital than today.

This is reflected in our investigation into the digital economy. During the first months of the COVID-19 lockdowns, our estimates show that the digital economy in CEE accelerated, capturing 78 percent, or €5.3 billion, of the increase seen in the whole of 2019 within the space of just five months. The rate of growth from January to May 2020, at 14.2 percent, was almost twice as high

as the year-on-year change observed in 2017–2019 (7.8 percent).

During the pandemic, the way people interact, work, travel, spend their leisure time, use public services and perform other routine activities has shifted dramatically. As the McKinsey COVID-19 Digital Sentiment Insights survey shows, almost 12 million new users of online services appeared in CEE—more than the population of Slovakia, Croatia, and Slovenia put together.<sup>4</sup> Notably, this increase was not only driven by the young population: the strongest growth was actually observed among consumers aged over 65.<sup>5</sup> While it is difficult to judge the “stickiness” of those behaviors, around 70 percent of survey respondents declared they will continue using new services digitally after the pandemic.

This leads us to another important point. Once consumers get used to new contactless channels, they might not be inclined to go back, particularly since health and safety measures related to COVID-19 may not disappear anytime soon. This unlocks great potential for companies that had already invested in digitization prior to the outbreak. But it also puts great pressure on other organizations, particularly small and medium-sized enterprises (SMEs), which lag behind on digital adoption, to quickly transform the way they interact with customers and run their businesses.

COVID-19 has also impacted the labor market, with many people losing their jobs or being put on temporary furlough. While the full effect is not yet reflected in the numbers, this may soon change, particularly as many support programs and furlough schemes are coming to an end. According to new analysis by McKinsey Global Institute, around 9.9 million jobs in CEE are at risk due to COVID-19.<sup>6</sup> About 36 percent of these jobs are also at risk of displacement due to automation by 2030.<sup>7</sup> This hints at the fact that COVID-19 may have accelerated changes that will lead to faster automation. Policymakers and businesses would be well-advised to introduce programs for reskilling and upskilling in order to avoid structural unemployment in the future.



Restrictions imposed during the pandemic accelerated digital adoption by citizens and required companies and governments to adjust the way they interact with them. Many decision makers and businesses now see digitization as a necessary step forward.

## **CEE's digital foundations are strong, but the talent pool needs strengthening**

In our previous Digital Challengers report, we said that having a resilient economy, a strong talent pool, high-quality digital infrastructure, and a vibrant technology ecosystem was the basis for digitization to become CEE's new growth engine. This time we once again looked at those aspects. Below, we describe what we found.

### **Macroeconomic performance**

Since 2004, the gap between Digital Challengers and Digital Frontrunners in terms of GDP at purchasing power parity (PPP) has narrowed from 60 to 31 percent.<sup>8</sup> While economic growth has been slowing down recently, it still remains more than three times as fast as the Big 5 and almost twice as fast as the Digital Frontrunners. Despite recent increases in costs, CEE's labor also remains much more affordable: with current growth rates, it would take almost 18 years for Digital Challengers to reach the level of labor costs seen among Digital Frontrunners in 2019.<sup>9</sup>

### **Talent pool**

While Poland and Slovenia topped the 2018 global PISA rankings for primary and secondary education, seven out of ten Digital Challenger countries scored below the EU average in math, science, and reading.<sup>10</sup> During the peak of COVID-19, schools had to move to remote education solutions, which uncovered significant gaps in digitization in this sector. Going forward, it would be advisable for the education system to put more emphasis on digital technologies—not only because of the threat of future lockdowns, but because in general, the way children engage with information has changed considerably over the last decades.

In our earlier report we stated that the CEE region had the largest pool of STEM graduates in Europe. This is no longer the case, since the number of students graduating in these subjects fell from 234,000 in 2016 to 216,000 in 2018.<sup>11</sup> Moreover, higher education attainment remains lower than among Digital Frontrunners, with a 14 percentage-point gap between the two groups today.<sup>12</sup> Going forward, attracting more students to STEM subjects by supporting university-industry collaborations could help strengthen the CEE talent pool.

One of CEE's strongest assets is its people. The “brain drain” or migration of the educated workforce has been a major challenge for the region in the past. While this remains an important issue, another trend has now emerged. In 2018, CEE experienced positive net migration for the first time in 30 years<sup>13</sup> with migrants serving as a new source of talent.

### **Digital infrastructure**

CEE continues to enjoy high-quality digital infrastructure. For instance, more than 92 percent of populated areas are covered by 4G and the share of fiber optic broadband has increased to 47 percent, overtaking the Big 5 and Digital Frontrunner countries. Moreover, connectivity is affordable in CEE. Looking ahead, the biggest source of competitiveness will be 5G technology, which enables real-time data analysis and the development of the Internet of Things (IoT). Current forecasts are that CEE will only achieve around 20 percent 5G penetration in 2024—less than half of the level of Digital Frontrunners and the Big 5.<sup>14</sup>

### **Tech ecosystem**

CEE's unicorns are worth around €31 billion.<sup>15</sup> 2019 marked yet another record year for technology investment in CEE, with almost €1.5 billion in venture capital attracted to the region.<sup>16</sup> This is more than five times the level in 2015, and puts Digital Challengers ahead of the other two country groups in terms of growth of venture capital.<sup>17</sup> However, CEE economies remain vastly underinvested: in the 2013–2020 period, investment per capita was eight times smaller than in the Big 5 and thirteen times smaller than in Digital Frontrunners.<sup>18</sup>

## **Action needed by policymakers, business and individuals in the next normal**

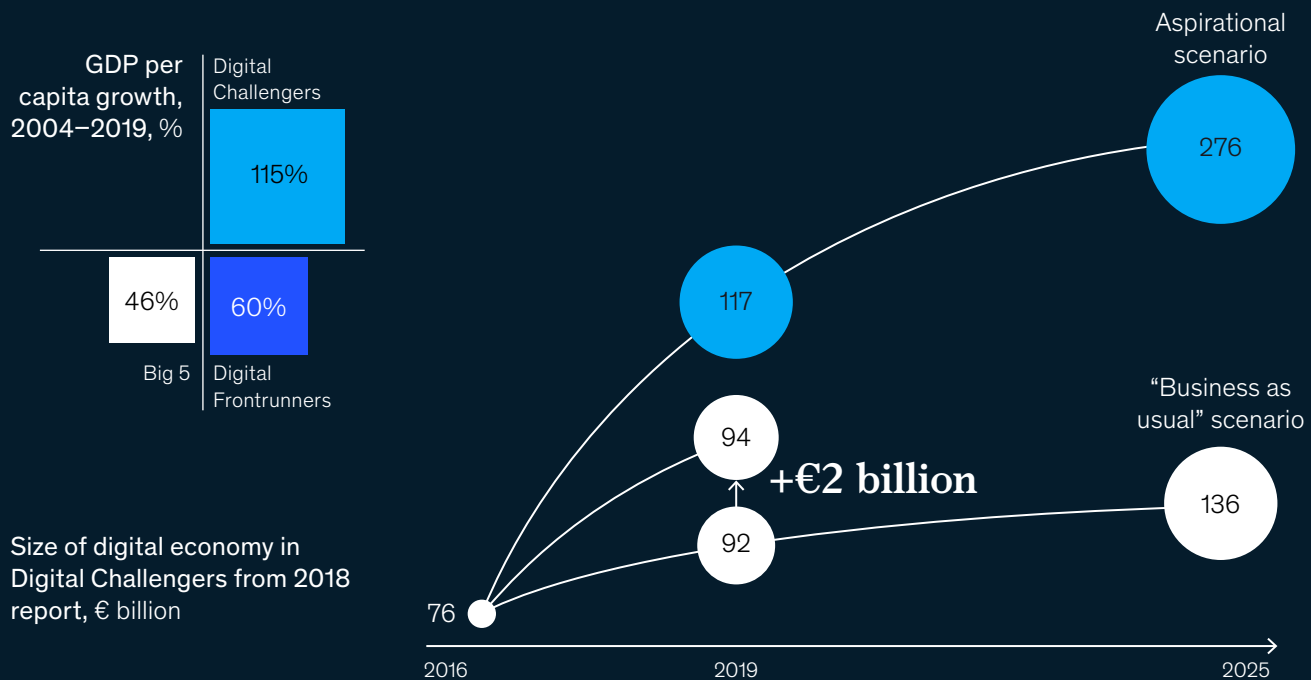
To move closer to the aspirational scenario for the digital economy outlined in our previous report, action is required by all stakeholders in Digital Challenger countries. Restrictions imposed during the pandemic are a catalyst for digital transformation. Not because they have significantly changed the solution, but because they have made the solution all the more important. Now, businesses need an e-commerce website, online customer service and cloud and automation technologies (including data analytics, AI, robotic process automation, and improved IT architecture) in order to survive. Therefore, many of the recommendations that we put forward in our report two years ago remain valid today. To successfully achieve a digital transformation, enterprises need a holistic approach, digitizing customer interactions, optimizing operations, and modernizing their IT.

Policymakers could consider bringing more public services online to meet the expectations of an increasingly digital society. Apart from developing internal capabilities, public institutions would be well advised to create a digital ecosystem in which individuals and businesses can thrive. They can do this by supporting entrepreneurship, creating incentives for SMEs to digitize and cooperating with “tech clusters”—sectors that enhance the competitiveness of the region.

What is also important is to boost collaboration on the CEE level. In this report we put forward the idea of creating a CEE Digital Council, similar to the initiative run by the Nordic states, that would drive the digital agenda and tap into the potential of a single digital market. Finally, digitization in the public sector should aim to improve digital inclusion and human development. To this end, governments could look into promoting digital skills among the population, on the one hand preparing younger generations for the demands of the future job market, and on the other helping adults to reskill or upskill.

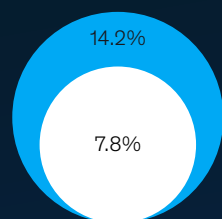
# Key findings

We have revisited the three regions defined in the previous report. In 2019, the CEE digital economy surpassed the “business as usual” scenario by €2 billion—but its full potential was not realized



In Jan–May 2020, the digital economy of CEE grew almost twice as fast as in previous years, achieving 78% of the total increase seen in 2019 in just 5 months

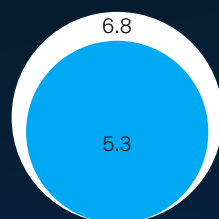
**Growth rate of digital economy, %**



- Growth, Jan–May 2020
- YoY growth 2017–19

**~2x**  
growth rate

**Value growth of digital economy, €**



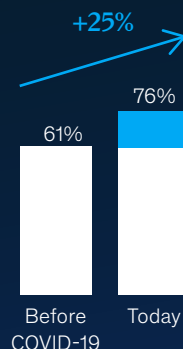
- Estimated increase Jan–May 2020
- Increase in 2019

**78%**  
of value growth in 2019 achieved within first five months of 2020

Three out of four people in CEE are now digitally engaged

**Digital adoption in CEE**

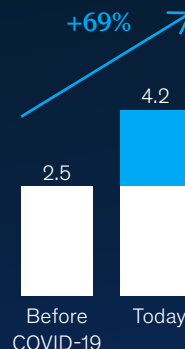
Share of users that accessed at least one service



**12m**  
new online service users in CEE

**Use of digital channels**

No. of sectors accessed digitally of the 10 surveyed<sup>1</sup>



**40%**  
increase in the number of users over age 65 who access online services, the highest among all age groups

<sup>1</sup> Sectors: banking, insurance, grocery, apparel, entertainment, social media, travel, telecommunications, utilities, public sector.

Source: Eurostat; Euromonitor; IMF 2004–19; McKinsey & Company COVID-19 Digital Sentiment Insights; survey results for the Czech Republic, Hungary, Poland, and Romania

## Strengths supporting digital growth in CEE are still valid; education begins to lose the edge



### Macroeconomic performance

60% to 31% decrease in GDP per capita gap (in PPP) among Digital Frontrunners between 2004 and 2019



### Vibrant tech ecosystem

€31 billion—estimated value of CEE unicorns; €1.5 billion—total VC investment in Digital Challengers in 2019



### Quality of digital infrastructure

92% of populated areas covered by 4G



### Primary and secondary education

7 out of 10 Challenger countries scored below the European average (DF, Big 5) in math, science, and reading in 2018 (PISA study)



### Higher education

11 percentage-point gap between Challengers and Frontrunners in tertiary education attainment; 234,000 to 216,000 drop in number of STEM graduates between 2016 and 2018

## New levers to pull by CEE on its digitization journey



### Migration

For the first time in 30 years, CEE immigration exceeded emigration (2018); 34% of CEE immigrants have higher education, more than the average for the whole CEE population (29% in 2019)



### EU recovery and resilience fund

Total €750 billion in grants and loans to fund COVID-19 recovery as well as support EU's green and digital priorities

## All actors across the CEE region have to act to accelerate digitally-led growth



### Public sector

- 1 Create CEE Digital Council**
  - Build a harmonized digital business environment in CEE
  - Induce best-practice sharing
- 2 Grow a digital ecosystem for businesses**
  - Support digitization of SMEs
  - Improve early-stage funding availability for start-ups
  - Support development of tech clusters
- 3 Accelerate public services digitization**
- 4 Invest in digital talent**
  - Adjust school curricula
  - Promote lifelong learning (including underprivileged groups)
  - Leverage positive net migration as a source of talent



### Business

- 5 Adjust business models**
  - Accelerate digital adoption
  - Increase operational efficiency (digital offering and channels, data analytics and AI, improved IT architecture)
- 6 Adopt flexible operating models** (eg., agile, remote work)
- 7 Implement reskilling and upskilling**



### Individuals

- 8 Engage in lifelong learning and invest in digital skills**
- 9 Take advantage of remote work models**



# Digital Challengers at a glance

Since the transition to a market economy over three decades ago, Central and Eastern Europe (CEE) has experienced a tremendous transformation. Between 2004 and 2019 the region's economy grew by 4.8 percent on average on a yearly basis, closing the gap in GDP per capita (in PPP) to its Western peers from 60 percent GDP in 2004 to 31 percent in 2019.<sup>19</sup> This success was driven by a number of factors, including strong traditional industries, dynamic exports, investments from abroad, labor-cost advantages and funding from the European Union (EU).<sup>20</sup> But now these advantages are beginning to weaken as the region's labor reserves dry up. Moreover, uncertainty surrounds

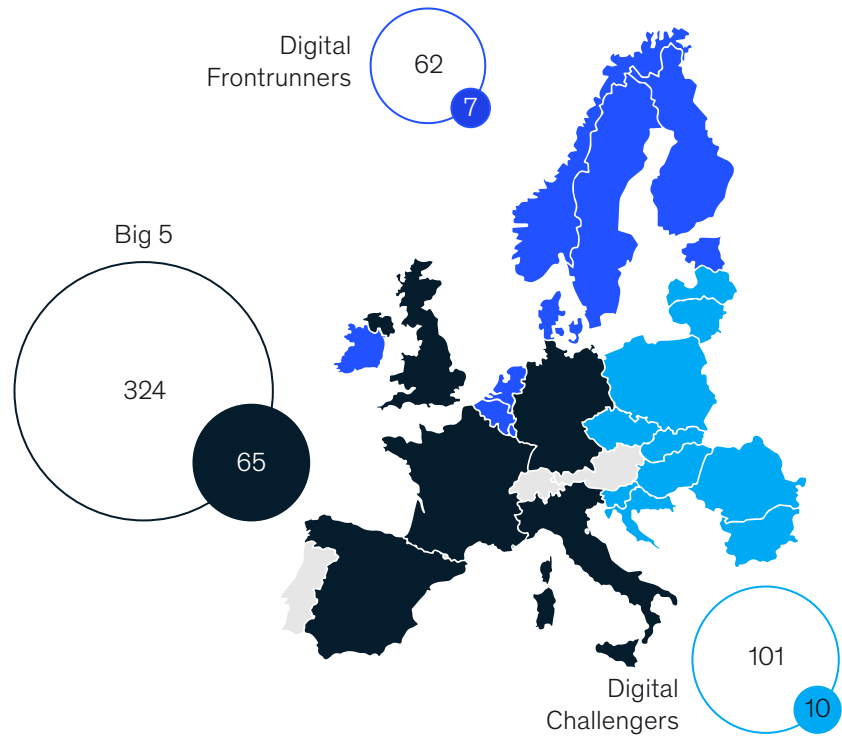
country-level funding in the EU's new budget for 2021–27. If it wishes to support further dynamic development, continue improving its citizens' quality of life, and provide a marketplace in which businesses can flourish, CEE now needs to review its growth strategies.

In 2018 we published a series of reports on the rise of Digital Challengers in CEE. We examined ten countries: Bulgaria, Croatia, the Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. We called these countries Digital Challengers because of their strong potential for growth in the digital arena and their potential to emulate other, with very high digitization rates.

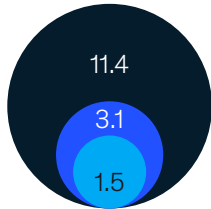
**Prior to COVID-19, Digital Challengers were catching up with their Western peers in terms of economic performance —however, a significant gap remains**

Total regional population vs country average, 2019, millions

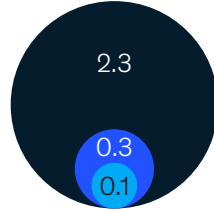
■ Digital Challengers  
■ Big 5  
■ Digital Frontrunners



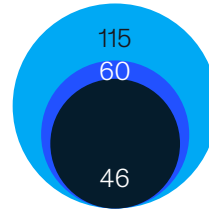
Total GDP, 2019, € trillion



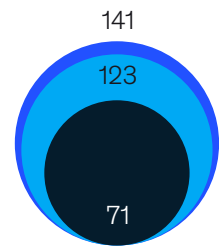
GDP country average, 2019, € trillion



GDP per capita growth,<sup>1</sup> 2004-2019, %

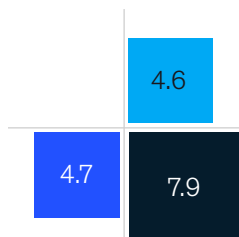


Market openness, 2019  
Trade as % of GDP

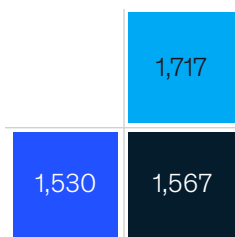


**With low unemployment rates, low capital stock, and high working hours, Digital Challengers must now leverage automation to close the productivity gap**

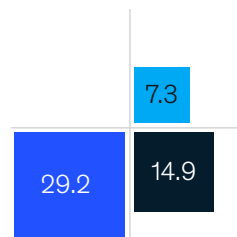
Unemployment, 2019, %



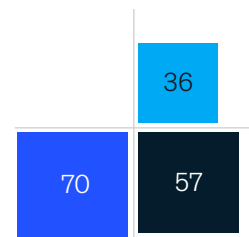
Average hours worked per person employed per year, 2019



Capital stock per employee, 2019  
€ thousand



Productivity, 2019, GDP per hour worked, €



1. Cumulative, in real terms (€). Nine CEE countries excl. Romania.  
Source: Eurostat 2019; OECD 2019, IMF 2004–19



In our 2018 reports we asked ourselves whether digitization could become a new growth lever for the region. Our analysis showed that developing the digital economy across all sectors in CEE could generate up to EUR 200 billion in additional GDP by 2025 thanks to increased productivity, a gain almost the size of Portugal's entire economy in 2017.

This could be achieved by closing the gap between Digital Challengers and countries that are digital leaders in Northern and Western Europe, a group we call Digital Frontrunners: Belgium, Denmark, Estonia, Finland, Ireland, Luxembourg, the Netherlands, Norway, and Sweden. A third group of countries, made up of France, Germany, Italy, Spain, and the United Kingdom, which we called the "EU Big 5" (a title we have now revised to the Big 5 due to Brexit) typically relies more heavily on their large internal markets. These five countries have relatively high digitization rates but do not rival the Digital Frontrunners.<sup>21</sup>

According to our new analysis, the growth engines driving economic development in Digital Challengers continued to lag behind the Big 5 and Digital Frontrunners in 2019. The CEE market was still undercapitalized compared with more advanced European economies. Just before COVID-19 emerged, the capital stock, measured as total gross fixed assets per employee, was on average 50

percent lower in CEE than in the Big 5.<sup>22</sup> Workforce costs were also rising, and unemployment in CEE was at record low levels—on average 4.6 percent in 2019, compared to 7.9 percent in the Big 5<sup>23</sup>—which means that there were limited labor reserves left to plug into the economy.<sup>24</sup> Clearly, CEE needed a new engine to drive its future economic growth.

Just as the economic growth of Digital Challengers was slowing down, a global crisis broke out—the COVID-19 pandemic. COVID-19 is a human tragedy that affects all of our lives. It is also having an increasing impact on the world economy and the process of digitization. CEE is no exception here. Besides the economic challenges of declining business activity, growing unemployment and expanding budgetary deficits, we are witnessing a shift of virtually every aspect of life toward online channels.

With this in mind, we decided to revisit our data on Digital Challengers to see how well CEE countries were doing just before the pandemic, how prepared they were for the disruption caused by COVID-19 and whether they are now still on a path to digitally-led growth. We present our findings in this report. We also put forward our recommendations for policymakers, businesses, and individuals about how they can leverage digitization in their efforts to build a more resilient CEE economy.

# 4.8%

## Growth of the region's economy on average on a yearly basis between 2004 and 2019





Budapest, Hungary

# 01

## Digitizing the CEE economy

Digitization is a broad concept that means different things to different stakeholders. To quantify digitization in the CEE economy, we use a metric developed in our last report on Digital Challengers, made up of three basic components:

- The value of the information and communication technology (ICT) sector
- The value of the e-commerce market, measured as online sales of goods
- The value of offline consumer spending on digital equipment (such as purchases of computers, in-home consumer electronics,

in-car entertainment, and portable consumer electronics in bricks-and-mortar stores)

This metric allows us to model the value of a given country or region's digital economy using a bottom-up approach and country-level figures from reliable sources (see the Appendix for more detail on the methodology used).

In this chapter we examine how much progress the CEE region has made in the years 2016–19, and compare that progress with estimates we made in 2018. We also discuss the COVID-19 pandemic and how it affected the digital economy in the first half of 2020.

## Size and growth of the CEE digital economy 2017–19

As we stated in the introduction, the CEE economy, with its relatively high GDP growth and historically low unemployment, thrived in the years 2017–19. Nonetheless, productivity lagged behind Western countries, as a diminishing labor supply and low capitalization challenged the traditional drivers of growth.

In our previous Digital Challengers report, we looked at digitization as a potential new lever that could sustain future growth and become a regional trademark. To evaluate the potential growth of the CEE digital economy, we presented two scenarios: a business as usual scenario, which assumed that historical growth rates for CEE countries would remain unchanged, and an aspirational scenario, which described the digital economy's potential if Digital Challengers achieved

the same pace of digitization and productivity improvement as Digital Frontrunners.

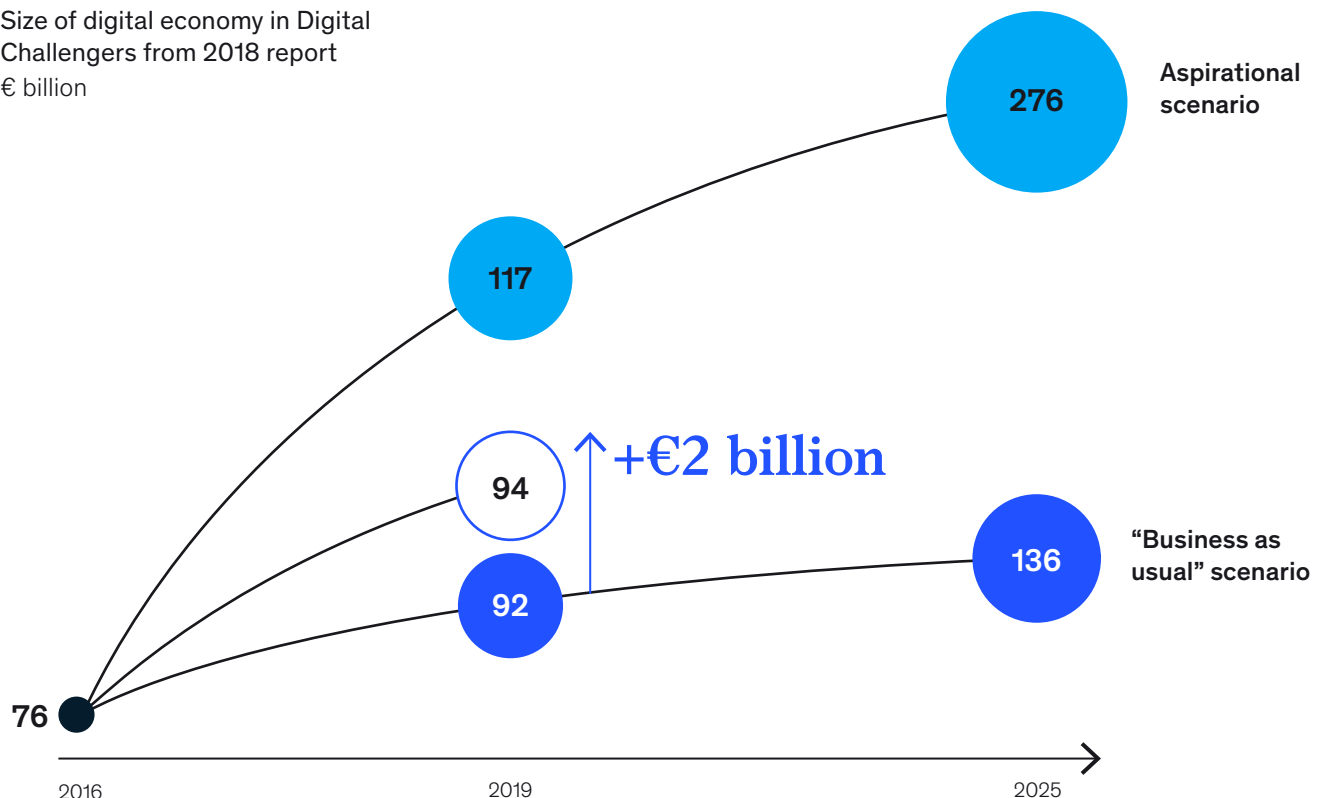
Now, we are in a position to assess the progress of CEE countries<sup>25</sup> (Exhibit 1). Our analysis shows that the CEE digital economy exceeded the business as usual scenario by €2 billion, growing to €94 billion in 2019 and contributing seven percent to total GDP. However, this is €23 billion below the level of the aspirational scenario, indicating that CEE countries have not yet launched the necessary digitization initiatives that would bring them closer to the more ambitious goal.

In 2016 the CEE digital economy was valued at €76 billion, or 6.5 percent of total GDP. This was comparable to its role in the Big 5 (6.9 percent of total GDP) but somewhat further behind the Digital Frontrunners (7.3 percent). Our snapshot from 2019 shows that the digital economy's share of GDP in

Exhibit 1

**In 2019, the CEE digital economy surpassed the “business as usual” scenario by €2 billion—but its full potential was not realized**

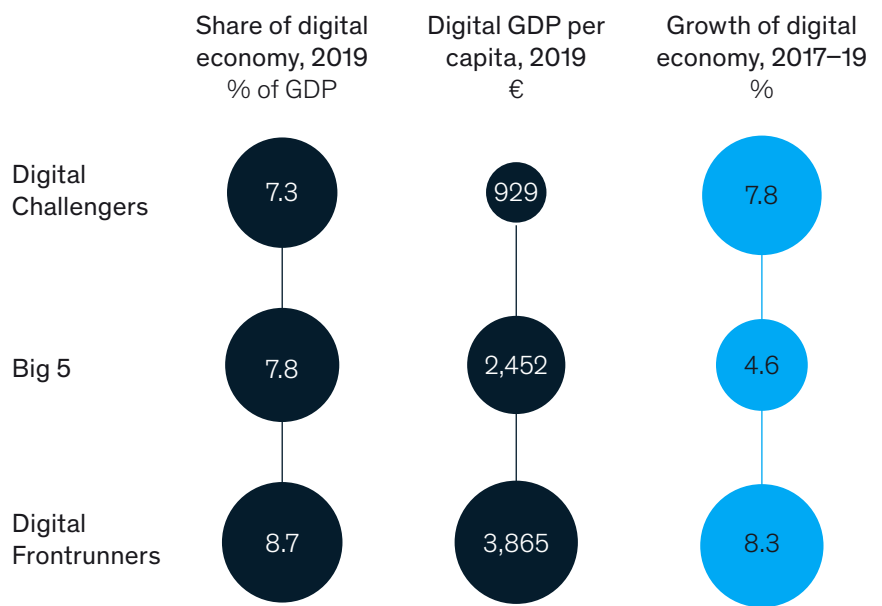
Size of digital economy in Digital Challengers from 2018 report  
€ billion



Source: Eurostat; Euromonitor; McKinsey analysis

Exhibit 2

## Digital Challengers' economies are accelerating, but not as fast as those of Digital Frontrunners



Source: Eurostat; Euromonitor; local institutes of statistics; McKinsey Global Institute analysis; McKinsey analysis

CEE was 7.3 percent (Exhibit 2), in other words, at the level of Digital Frontrunners three years earlier. This is less than one percent below the Big 5, but the gap between CEE and Digital Frontrunners has widened from 0.8 percent to 1.4 percent. Digital GDP per capita in CEE is now €929, four times less than the average for Digital Frontrunners.

CEE managed to increase its rate of digital GDP growth from 6.2 percent in the period 2012–16 to 7.8 percent in 2017–19. This means that Digital Challengers were digitizing almost twice as fast as the Big 5 over the past two years. However, digitization in CEE was slower than among Digital Frontrunners, which managed to boost their rate of digital GDP growth to 8.3 percent, thus increasing their lead over Digital Challengers. Evidently, Digital Challengers still have plenty of room for improvement.

### COVID-19 impact on the digital economy

The coronavirus outbreak is both a humanitarian crisis and an

unprecedented challenge for the global economy. At the time of writing, in Europe alone, COVID-19 has infected over 3.8 million people and caused more than 210,000 deaths.<sup>26</sup>

Not all countries have been affected equally. CEE countries have on average 1,400 cases per million inhabitants, while the Big 5 have more than double this (3,800 per million) and Digital Frontrunners more than triple.<sup>27</sup> These differences are partially due to lower rates of testing in Digital Challengers, at 83 tests per thousand inhabitants, 46 percent less than in Digital Frontrunners.<sup>28</sup> However, a significant contributing factor was the CEE's early implementation of the mandatory wearing of masks outdoors and strict lockdown measures, including full border closures, limitations on social gatherings, heavy restrictions on all nonessential services, restricted availability of public services, and nationwide school closures.

Large-scale lockdowns meant long-term closures for bricks-and-mortar stores and long interruptions to

services and production. During this period, the only way many companies could continue their commercial activity was through online channels. Sales shifted from physical to e-commerce, while operations were conducted using communication technology such as videoconferencing. Digital services became indispensable.

The question, however, is whether COVID-19 also increased digital GDP on a country and regional level. The data for 2020 is still incomplete, so we have used estimates in our analysis (for detailed methodology see the Appendix). Our calculations confirm that digitization did indeed speed up during the pandemic: around 76 percent of the digital GDP achieved in the whole of 2019 in CEE was already generated in the first five months of 2020 (Exhibit 3). The digital economy grew by EUR 5.3 billion between January and May 2020, or more than 14 percent, compared to the same period in 2019. As the overall economy was shrinking over the same period, the contribution of digital to total GDP increased from seven percent

in 2019 to nine percent in 2020, thus achieving the business as usual target for 2025. This will likely change once the economy is up and running again. But, be that as it may, it is clear that lockdowns prompted a tremendous digital shift.

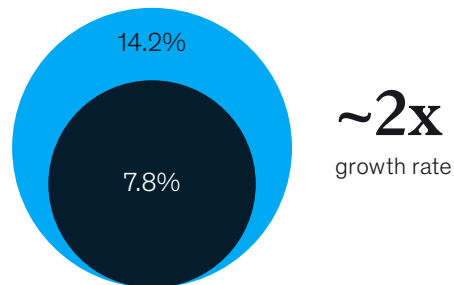
While the pandemic has sparked a massive crisis, one that now presents

us with a unique challenge, we should nonetheless take the lessons of 2020 into account when planning the path forward. Rather than returning to business as usual, governments, organizations, and individuals would be well advised to acknowledge both the volatility of today's world and the importance of digitization in improving our future resilience.

Exhibit 3

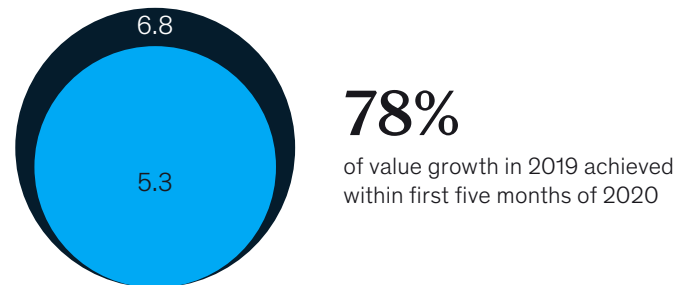
**In Jan–May 2020, the digital economy of CEE grew almost twice as fast as in previous years, achieving 78% of the total increase seen in 2019 in just 5 months**

Growth rate of digital economy,  
%



● Growth, Jan–May 2020  
● YoY growth 2017-2019

Value growth of digital economy,  
€



● Estimated increase Jan–May 2020  
● Increase in 2019

Source: Eurostat; Euromonitor; McKinsey analysis

**In 2020, the CEE digital economy is expected to contribute even more to total GDP due to faster growth of digital combined with shrinking GDP**

**-6.4%**

Estimated drop in 2020 GDP<sup>1</sup> in CEE countries vs 2019

**8.9%**

Estimated share of CEE's digital GDP in 2020

1. Assuming Digital economy to grow at the same rate as between 2017–2019 between Jun–Dec 2020  
Source: European Commission, Eurostat, Euromonitor, McKinsey analysis





Split, Croatia

# 02

## The CEE region's digital foundations

Digitization is a complex topic, involving many different dimensions and processes. In order to strengthen digital transformations, all economic actors must play an active part, from policymakers, large corporations, and small and medium-sized enterprises (SMEs), right down to individual citizens. Together, they can build a digital ecosystem that both stimulates digital adoption within their region and attracts investors from abroad.

In our Digital Challengers reports, published two years ago, we identify four key areas of digitization where CEE enjoys a competitive advantage over other, more advanced digital economies. They are its resilient economy, strong talent pool, high-quality and affordable

digital infrastructure, and vibrant technology ecosystem. In this chapter we examine those areas to see whether they have stood the test of time, and determine what impact the COVID-19 pandemic has had on them.

### **Competitive advantages**

#### **A resilient economy**

CEE has long been recognized as one of the most fast-developing regions in the world. The market-oriented economic reforms of the 1990s and subsequent accession to the European Union has allowed the CEE countries to modernize and become an attractive target for foreign direct investment (FDI). Since 2004, when most Digital Challengers joined the European Union,

# 18 years

Time it would take for Digital Challengers' labor costs to reach the 2019 level of Digital Frontrunners

the GDP per capita (PPP) gap between them and the Digital Frontrunners has fallen from 60 to 31 percent.<sup>29</sup> Some countries, including the Czech Republic, Hungary, Lithuania, Poland, Slovakia, and Slovenia, have even managed to overtake some more mature economies in Western Europe. While GDP growth in CEE has shown signs of slowing down in recent years, it remains more than three times as fast as in the Big 5 and almost twice as fast as among Digital Frontrunners.<sup>30</sup>

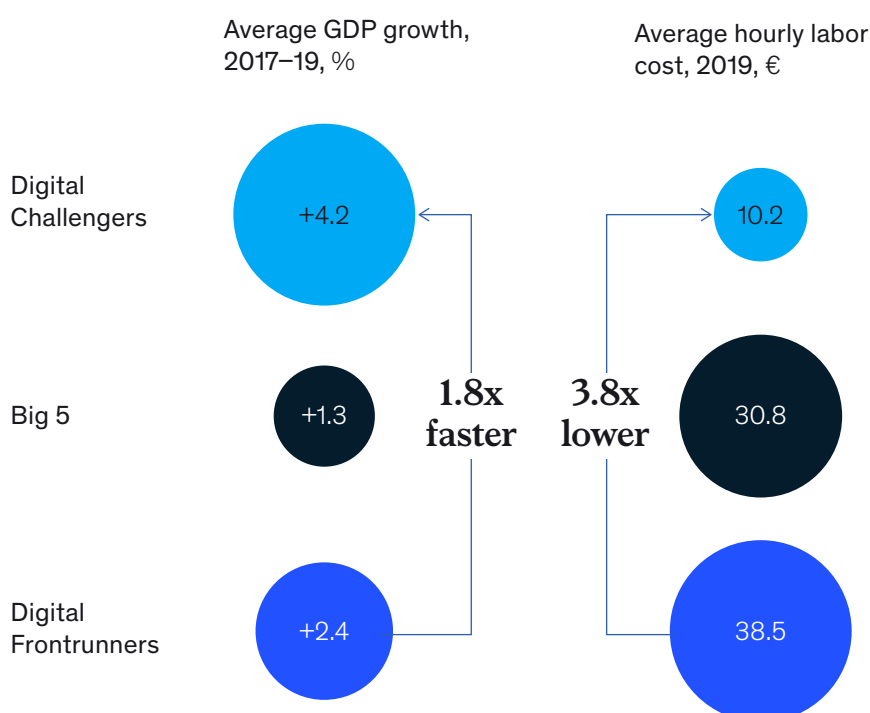
One of the most prominent features that has attracted investors to CEE is its affordable workforce. With an average hourly wage of €10, CEE labor costs are three to four times lower than in other countries (Exhibit 4). The difference in hourly rates between Denmark, the EU country with the highest labor costs in 2019, and Bulgaria, which had the lowest labor costs, is as much as €39. Despite the much faster increase in costs in CEE from 2016–19, at around eight percent a year, it would take

almost 18 years for Digital Challengers to reach the level of labor costs seen among Digital Frontrunners in 2019.<sup>31</sup>

As mentioned before, labor productivity in CEE grew by 4.7 percent from 2010–19, overtaking both Digital Frontrunners and the Big 5.<sup>32</sup> However, with a gap in productivity of 37–48 percent between CEE and other countries in 2019, the difference remains significant. This is likely due to the low capital stock per employee in CEE, which is three times below that of Digital Frontrunners. In practical terms, this means that CEE have less equipment and fewer assets that could automate some of their manual labor. The availability of low-paid workers has allowed CEE countries to circumvent the need for higher efficiency. However, with historically low unemployment, at 4.6 percent (2019), which equates to low labor reserves, this will soon no longer be a viable option.<sup>33</sup> This is a call to action for all CEE governments and businesses to increase their investment in innovation.

Exhibit 4

**Digital Challengers have smaller economies but they are growing fast—labor costs are significantly lower**



Source: Eurostat, 2017–19



### A strong talent pool

The backbone of every digital society is a good education system. This fact is apparent when one looks at Digital Frontrunner countries, which are known for their top-ranking schools. In our earlier reports we found that CEE's strong talent pool is one of its key advantages. Indeed, its results in the area of primary and secondary education are comparable to those of other countries. However, the region lost its position of having the largest pool of STEM (science, technology, engineering, and mathematics) graduates in Europe.<sup>34</sup>

Data from the OECD Program for International Student Assessment (PISA) study, which measures the quality of K-12 schools,<sup>35</sup> indicates that the distance between Digital Challengers and Digital Frontrunners has remained roughly similar to that identified in our previous report: the gap has increased, but only by one percent, making it

five percentage points in 2018. In the same year, CEE actually managed to exceed the average for the Big 5, achieving higher maximum scores for mathematics, reading and science (Exhibit 5). Within this, the results vary greatly between the countries in CEE. Poland and Slovenia are the two best performers in the region, Poland coming 11th in the global ranking and Slovenia 13th. The other CEE countries are advised to try to emulate best practices from Digital Frontrunners such as Estonia, which ranked fifth in the global ranking in 2018 and has one of the most innovative models of education in the world. Estonia launched the "ProgeTiger" project in 2012, which introduced computer programming at all levels of education, from kindergarten to lifelong learning. Interestingly, teachers in Estonia are entrusted with managing the syllabus in a fairly autonomous way, which translates to a greater sense of ownership and responsibility for students' progress.<sup>36</sup> The Estonian

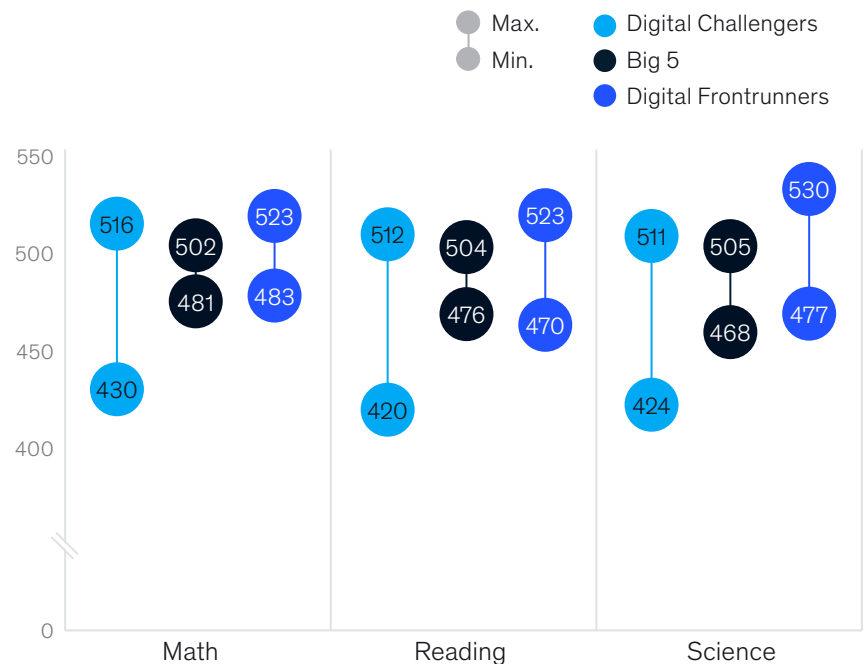
system also employs a host of innovative solutions, such as digital knowledge databases, digital textbooks, digital class diaries, and online learning platforms.

Another example of best practice is found in Croatia, where young people aged 16–24 topped the digital skills statistics by Eurostat in Europe, with 96 percent of young people having basic or above basic digital skills. In addition to a good standard of digital education in schools, the country has introduced its Croatian Makers program, the largest non-governmental educational program in the European Union. This program has supported the digital education of more than 150,000 children and educated more 3,000 teachers in the country, free of charge.<sup>37</sup> Indeed, it has been so successful it has now been extended beyond Croatia's borders to neighboring countries, including Serbia, Bosnia and Herzegovina, and Kosovo.

Exhibit 5

### Quality of primary and secondary education does not differ significantly between Digital Challengers and Digital Frontrunners

PISA results, avg. scores for math, reading, and science (min./max.), 2018

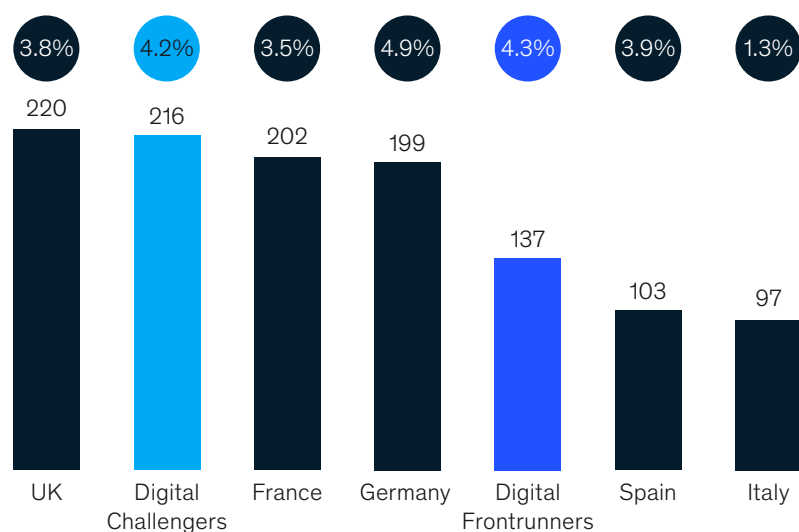


Source: OECD, 2018

Exhibit 6

## Digital Challengers have the second-biggest STEM graduate pool in Europe and a similar share of ICT graduates

Number of STEM graduates,<sup>1</sup> in '000s, 2018



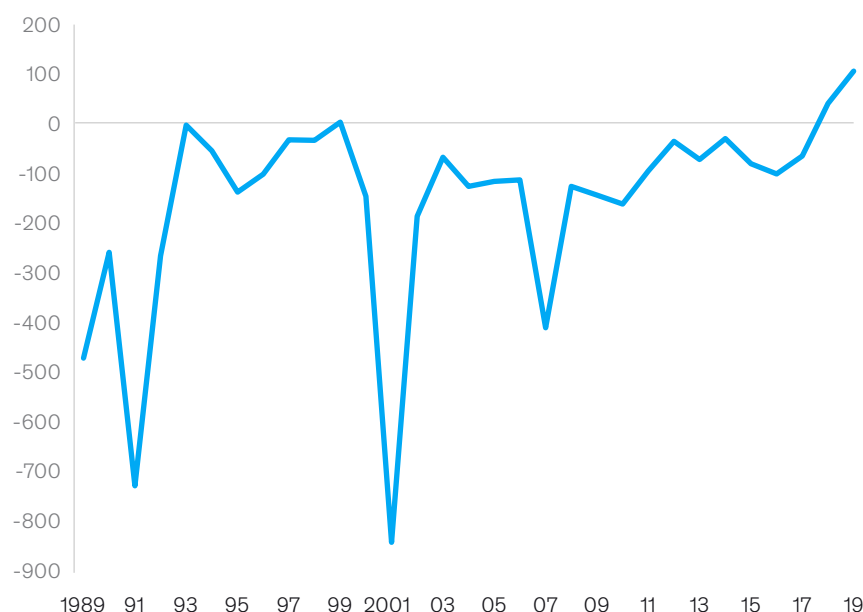
○ ICT graduates, as % of all graduates

1. Incl. Bachelor, Master and doctoral level.  
Source: Eurostat, 2018

Exhibit 7

## For the first time in the last 30 years,<sup>1</sup> CEE experienced more immigration than emigration

Net migration in Digital Challengers, 1989–2019  
Immigration less emigration, in '000s



1. Except in 1999, likely due to the Second Chechen War.  
Source: Eurostat, 1989–2019

One of the key assets of digital economies are their highly-skilled technical graduates, as reflected by the number of STEM graduates (Exhibit 6). In our earlier report we highlighted that the CEE region has the largest pool of these graduates in Europe. This is no longer the case, as the number of students graduating these subjects fell from 234,000 in 2016 to 216,000 in 2018. CEE is now outranked by the United Kingdom, France, and Germany in terms of share of population.

At the same time, the proportion of ICT graduates among all graduates in CEE has risen from 3.6 to 4.2 percent, the highest level after Germany and the Digital Frontrunners.<sup>38</sup> Importantly, the quality of ICT programs, in particular programming, is considered to be among the highest in the world,<sup>39</sup> and the winners of international programming competitions regularly come from the CEE region.<sup>40</sup>

When discussing higher education, it is also important to consider attainment levels. In 2019, 29 percent of the population aged 25–34 in Digital Challengers had degrees—a three percentage-point improvement on 2015. Over the same period, Digital Frontrunners improved their score by four percent, widening the distance from Digital Challengers to 14 percentage points in 2019.<sup>41</sup> This may not be a dramatic shift, but it once again indicates that the CEE talent pool is not growing as fast as it could, thereby undermining one of the region's key advantages.

We identify another trend, however, that could help counteract this widening gap. In 2018, for the first time in 30 years, CEE experienced more immigration than emigration (Exhibit 7), meaning that more people moved to the country than left it.<sup>42</sup> Poland was the key driver of this new migration trend, granting the most visas in the whole of Europe in 2018.<sup>43</sup> Over half of the newcomers state that work was the primary reason for their migration—a much higher level than in other countries high in the ranking, where family reasons were the leading factor. In addition, more than 52 percent of

people migrating to Poland had higher education, which is 21 percentage points more than the level found in the Polish population in general.<sup>44</sup> The question remains whether those migrants manage to find work in their own professions or have to resort to low-skilled jobs due to language and cultural barriers. However, given that the ICT sector often operates in English and coding languages are international, immigration could represent a valuable new source of digital talent for Digital Challengers.

### High-quality digital infrastructure

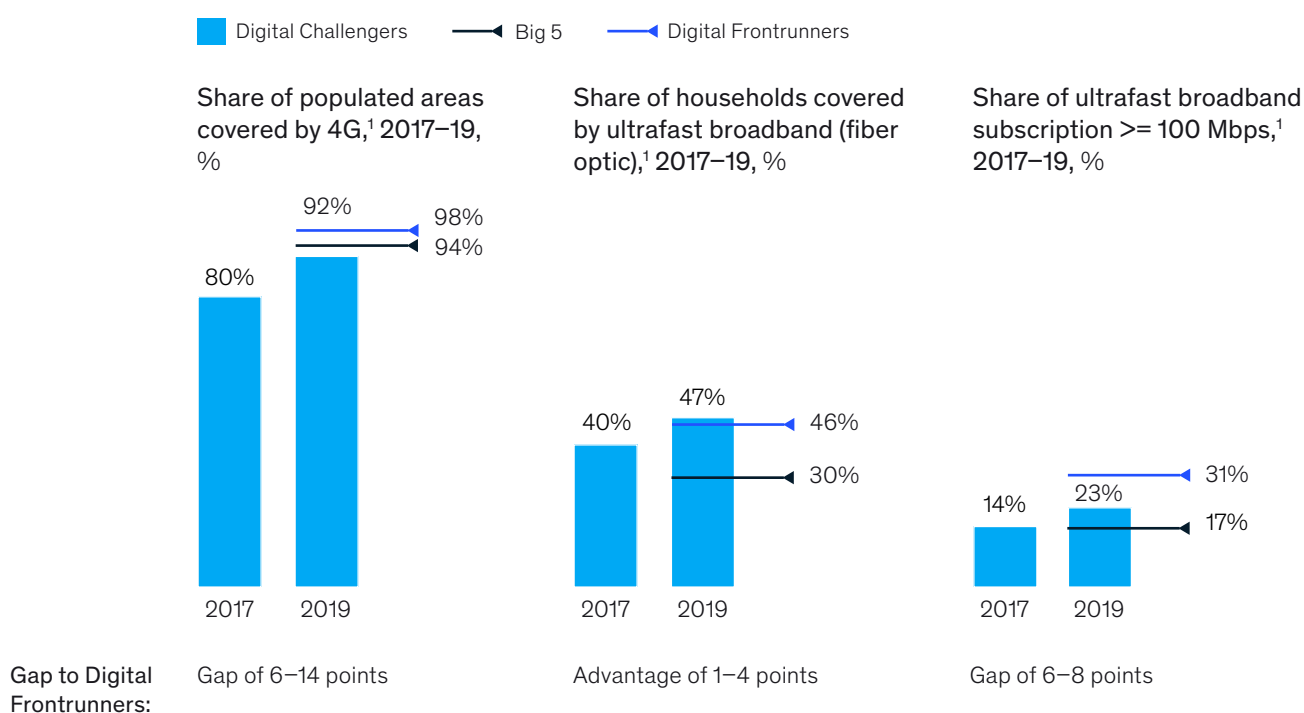
In today's world, connectivity is no longer merely one product among many offered by the telecommunications industry. It is part of the fabric of the digital economy, linking individuals, communities, businesses, and economies. Digital infrastructure, such as mobile connectivity and fixed broadband, is not only a platform for interaction but also a driver of

productivity, competition, and new market opportunities.

In our previous Digital Challengers studies, we reported that CEE was well connected, its digital infrastructure forming a strong foundation for the digital economy. This holds true today, with 47 percent of households connected to fixed broadband—around one percent higher than among Digital Frontrunners.<sup>45</sup> In terms of mobile coverage, 4G coverage has grown to 92 percent, reducing the gap from 14 percentage points to just six, mainly due to improvements in Romania, Croatia, Bulgaria, and Slovakia.<sup>46</sup> In ultrafast broadband, CEE increased subscriptions to 23 percent, compared to 31 percent in Digital Frontrunners<sup>47</sup> (Exhibit 8). These improvements in infrastructure are due to multiple initiatives across the region, such as the Polish National Broadband Plan, which aims to connect every household to broadband Internet before the end of 2020.<sup>48</sup>

Exhibit 8

## Digital Challengers are catching up with Digital Frontrunners in terms of mobile coverage, but lag behind on ultrafast broadband subscriptions



1. Excl. Norway.  
Source: DESI, 2017–19

Apart from its good quality, CEE digital infrastructure has one other defining feature: its low price. In most Digital Challenger markets, the amount spent on broadband represents a smaller share of household earnings than in Digital Frontrunner markets, with Romania leading with the highest score.<sup>49</sup> This means better value for money for CEE citizens and businesses, which are increasingly dependent on access to the Internet.

While it might appear that CEE has already mastered the connectivity challenge, in fact there are more technological disruptions ahead. Large-scale deployment of 5G is just around the corner, with 92 percent of global operators planning deployment by 2022.<sup>50</sup> Under the EU 5G Action Plan, the first auctions for the 5G spectrum should happen this year, with countries obliged to introduce the technology in at least one city.<sup>51</sup> The investment required for the deployment of 5G will almost double the costs for operators; in addition, the spectrum costs are almost four times as high for 5G than for the previous generation.<sup>52</sup>

Peak 5G speeds are expected to be up to 100 times faster than 4G LTE networks, allowing users to download content in a matter of seconds.

Reduced latency and increased network capacity will support the development of the Internet of Things (IoT) and artificial intelligence (AI),<sup>53</sup> which should lead to massive improvements in efficiency, real-time data analysis, and new market opportunities. Nonetheless, due to the competitive environment in the telecommunications industry and the fact that customers are not willing to pay a high premium for extra speed might limit return on investment.<sup>54</sup> The low prices enjoyed by customers in CEE exacerbate the problem. This may be why Digital Challengers are forecast to have just 19 percent 5G penetration by 2024, less than half the level of Digital Frontrunners and the Big 5.<sup>55</sup>











### **A vibrant technology ecosystem**

The CEE technology ecosystem is booming, with a number of start-up unicorns and a large pool of rising stars. Various tech clusters are emerging on a regional and country level, strengthening the credibility—and visibility—of specific sectors and individual players on the international stage. However, due to the small size of the individual markets, CEE start-ups suffer from limited access to funding, indicating a need for intervention by policymakers.

**A vibrant technology ecosystem:  
The CEE technology ecosystem  
is booming, with a number  
of start-up unicorns and a  
large pool of rising stars.**

Exhibit 9

## In 2019, there were 7 CEE unicorns and multiple rising stars

|                           |           |  |  |  |  |  |  |  |  |  |
|---------------------------|--|---|---|---|---|---|---|---|---|---|
|                           | Poland   | Hungary   | Romania   | Croatia   | Czech Rep.  | Latvia  | Lithuania   | Bulgaria  | Slovenia  | Slovakia  |
| Unicorns                  | Allegro<br>CD Projekt  |   | Ui Path<br>eMag   | Infobip   | Avast   |   | Vinted  |   |   |   |
| Rising stars <sup>2</sup> | Applica<br>Booksy<br>Brainly<br>Docplanner<br>Huuuge<br>Infermedica<br>Nomagic<br>Packhelp | Almotive<br>Prezi<br>Tresorit<br>Bitrise<br>Commsignia<br>Sharp3D                 | Elefant.ro  | Bellabeat<br>Qualia<br>Rimac<br>Nanobit   | Twisto<br>Liftago   | Lokalise<br>Mintos<br>Sonarworks  | CityBee<br>Tesonet  | Remix<br>Gtmhub<br>OfficeRnD  | Geneplanet<br>Eligma<br>Sinergise   | Sli.do<br>Photoneo<br>Minit   |
| Large exits <sup>3</sup>  |  | LogMeIn   |   |   | Kiwi.com<br>Socialbakers  |   |   | Telerik   | Outfit7   |   |

1. Unicorns: companies founded since 1990 with \$1 billion valuation. Incl. companies that dropped below the \$1bn mark after going public.

2. Rising stars: non-acquired, non-public start-ups founded since 2000, with minimum €1m in total funding, funded since 2015, maximum valuation €800m.

3. Large exit: acquisitions/IPOs of VC-backed start-ups. The term "large" is subjective and can change based on the region. In case of CEE countries, it includes €100m+.

Source: Dealroom, 2019

The CEE ICT sector is growing, with a larger share of high-growth enterprises than among Digital Frontrunners. The share of employment in such companies is also higher, most likely due to the lower costs and better availability of labor in CEE. The region's unicorns are worth almost a total of EUR 31 billion and mainly stem from Poland and Romania, followed by the Czech Republic, Croatia, and Lithuania.<sup>56</sup> In addition, there is a vast number of rising stars (Exhibit 9), which have already received more than EUR 2.8 billion in investment.<sup>57</sup>

If we consider both established players and emerging start-ups, a number of clusters becomes apparent in CEE. Gaming studios, cybersecurity software firms, and fintech companies in particular are making their mark on the global stage (Exhibit 10). For example, thanks to rapid growth, CD Projekt Red, a Polish video game developer best known for its series *The Witcher*, has become the biggest gaming studio in

Europe.<sup>58</sup> In cybersecurity, the three top companies in the region—Avast (based in the Czech Republic), ESET (Slovakia) and (Romania)—together have more than one billion users globally,<sup>59</sup> ten times the population of the whole CEE region.

Lithuania is the EU's largest fintech hub, with more than 210 companies in 2019—a large number for a country of just three million inhabitants.<sup>60</sup> Lithuania's success is not accidental, however: the Bank of Lithuania facilitated market entry for newcomers by streamlining the licensing process and automating the number of supervision procedures. Organizations and communities such as ROCKIT, Fintech Hub LT, FINTECH Lithuania, and Blockchain Centre Vilnius also created spaces for exchanging knowledge and STEM within the fintech space.<sup>61</sup> The areas of e-commerce, education technology, and telemedicine are also now kindling investors' interest in CEE (Exhibit 11).

## CEE gaming cluster—example companies

### Poland

**Chess & Checkers** was founded in 2015. Initially developed as a side project, it turned into a prosperous business. The company develops board games for cell phones with Android and iOS software. Chess & Checkers games have been downloaded over 70 million times.

**Reality Games** is a gaming studio developing mobile games based on live, real-world Big Data. In 2015, Reality Games launched its first game, Landlord Real Estate Tycoon, with over 12 million players. The primary goal of Reality Games is to add value to multiple segments of the gaming industry. For players, the company develops engaging and entertaining games. For developers, it offers game engine services and serves as an aggregator of APIs from different sources.

**Huuuge Games** released its first game in 2014. Since then, the company has focused on creating real-time easy-to-play, mobile social games. The most famous game created by the company is Millionaire Casino, which contributed to the rapid growth of the company's value in 2017. Huuuge Games employs more than 600 people and has 1.5 million daily active users and 150 million player connections.

**Ten Square Games** is one of the biggest mobile games development companies in Poland. Founded in 2011 in Wrocław, the company is experimenting with unique 3D game ideas targeted at the social Web. Ten Square Games had quickly developed into a company employing nearly 250 people. It has released 200 different games and has 21 million active players. The most popular games developed by the company are Fishing Clash, Wild Hunt, and Let's Hunt.

### Slovenia

**Outfit7** is a Slovenian video game developer, the creator of the Talking Tom and Friends app and media franchise. The company has up to 410 million monthly active users playing 23 games, which generated US\$130 million in revenue in 2019.



## CEE digital fintech cluster—example companies

### Poland

**Blue Media** has 20 years of experience developing innovative services in the field of electronic payments. More than 6 million clients receive electronic invoices generated by Blue Media's online systems. The company processes 3 million payments yearly, totaling more than PLN 270 million. The Blue Media payment system BlueCash (instant transfers) is offered by over 100 banks and handles more than 200,000 transfers every month.

### Latvia

**Creamfinance** makes money available by providing one-click loans to consumers globally. The company has experienced continuous growth since its foundation. Creamfinance has developed in-house scoring technology that is rated among the top three worldwide for speed and accuracy of credit scoring.

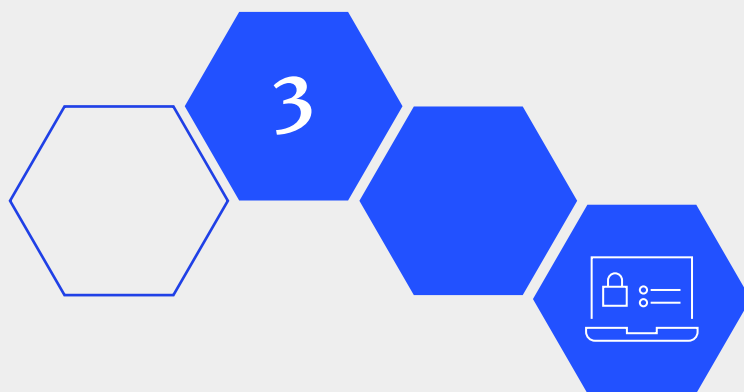
### Lithuania

**FinBee** is a peer-to-peer lending platform that has been providing services to individuals and companies in Lithuania and the Czech Republic since 2015. The company connects small businesses that are overlooked by banks and need finance to grow with investors who want to lend to them and earn great returns.

**FinBee Verslui** is the first and most active crowdfunding platform in Lithuania, serving thousands of retail and institutional investors, and SMEs. It was the first to implement SME support mechanisms initiated by the state's business support agency INVEGA. Its activity is supervised by the Central Bank of Lithuania.

Source: Company sites, chessandcheckers, outfit7, LinkedIn





## CEE cybersecurity cluster—example companies

### The Czech Republic

**Avast** is a multinational cybersecurity software company, operating in more than 50 countries and headquartered in Prague, using next-gen technologies to fight cyberattacks in real time. Its growing patent portfolio is focused on four key areas: malware detection and blocking, AI and machine learning, Internet of Things, and location technologies. The company has more than 435 million monthly active users and has the second-largest market share among anti-malware application vendors worldwide.

**435 million**

monthly active users

### Slovakia

**ESET**, headquartered in Bratislava, is an Internet security company that offers antivirus and firewall products and which has grown into a global brand with over 110 million users in more than 200 countries and territories. For 30 years, ESET has been developing industry-leading IT security software and services for businesses and consumers worldwide.

**110 million**

users in more than 200 countries and territories

### Romania

**Bitdefender** is a cybersecurity and anti-virus software company, founded in 2001 in Romania. The company develops and sells antivirus software, Internet security software, endpoint security software, and other cybersecurity products and services. As of 2018, its software has about 500 million users worldwide. Offices are located all over the world, including in the US, UK, and Australia.

**500 million**

users worldwide

### Lithuania

**FIMA** is a system integrator that designs intelligent engineering systems and tailor-made solutions for organizations across the Baltic region. The company offers a range of engineering services and solutions including security, automation and telecommunication systems. FIMA's head office is located in Vilnius and has subsidiaries in Latvia and Poland. The company employs 500+ people and has implemented more than 15,000 projects.

**€83 million**

group revenues in 2018

## CEE digital education cluster—example companies

### Poland

**Brainly**, founded in 2009, Brainly is one of the fastest-growing Internet businesses in the edtech space. The company has developed educational Q&A-type social networking site for students. The platform connects peers to help strengthen their skills in math, science, history, and beyond. It has 200 million unique users monthly, boasting

- 35+ countries
- 130+ employees
- 50+ million questions answered

**Skriware** offers educational solutions for practical STEAM education in schools and at home. The company provides high-quality, affordable 3D printers with WiFi connection, touchscreens and magnetic removable beds. Skriware also runs Skrimarket, a platform connecting experts with everyday users and enabling even those with no experience to fully explore the possibilities of 3D printing.

**NovaKid** is an early English learning platform that allows children around the world to learn English through remote practice with native-speaking teachers. It also offers AI-powered games and training apps that promote English speaking and comprehension based on authentic content in English.

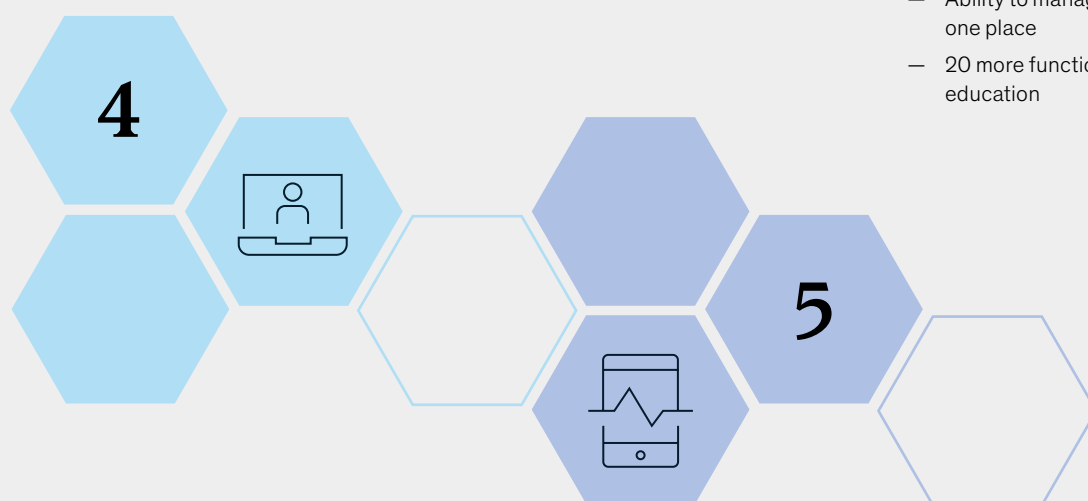
### Hungary

**CodeBerry**, founded in 2016, is an online platform for learning programming. Access to lessons is granted after payment of a monthly subscription. CodeBerry offers programming courses in 20 languages.

### Romania

**Kinderpedia** is an online communication and management solution for schools and kindergartens. It provides:

- Free remote video teaching
- Daily attendance records, gradebooks, and reports
- Secure, personalized document sharing
- Ability to manage all activities in just one place
- 20 more functionalities for connected education



## CEE e-health cluster—example companies

### Romania

**Regina Maria** is a virtual clinic and online medical consultation platform. It was developed with Microsoft Romania and has over 100 physicians, with specialties ranging from internal medicine, gastroenterology, ENT, endocrinology, and pediatrics to dermatology, pediatric psychology, and nutrition counseling. It is available on both iOS and Android.

**Medlife**, a market leader in private healthcare in Romania, has launched an online platform for video consultations, featuring over 80 specialized healthcare professionals, and convenient sending of medical documentation via app. Due to local legal restrictions, neither prescriptions nor formal diagnoses are possible online.

### Poland

**Infermedica** is a Polish medtech company that creates solutions using artificial intelligence to facilitate initial medical diagnostics and manage patient traffic. It offers a phone application, Internet platform, chatbot and API. Founded in 2012 in Wrocław, the company operates as a B2B, serving mainly insurance companies, hospitals, telemedicine, and IT companies.

The company's technology is based on the recommendation engine. After entering the patient's symptoms and risk factors, the statistical algorithm processes the data using the accumulated knowledge base and calculates the probability of a given disease.

**Telemedi.co** is a Polish telemedicine platform offering remote consultations with

physicians with various specialties via the Internet or telephone.

During telemedicine consultations, Telemedi.co physicians conduct a full medical interview, interpret the results of laboratory and imaging tests, and make recommendations regarding treatment.

**DocPlanner** is a platform matching physicians with patients and vice versa. It enables patients to search for an appropriate physician based on ratings and patients' opinions. This saves on physicians' time by managing visits, and cuts no-shows by half. DocPlanner also offers online chat and consultations with physicians and a free mobile app for patients with a visit calendar.

The year 2019 marked yet another record for technology investment in CEE, with almost EUR 1.5 billion in venture capital funding in the region<sup>62</sup> (Exhibit 12). Romania led the way in terms of total venture capital invested, largely driven by financing rounds for UiPath, a global software company that is developing a platform for robotic process automation (RPA).<sup>63</sup> This is considered the world's first platform for hyperautomation, a combination of RPA, process mining, AI, machine learning, and analytics. Poland leads in terms of the number of funding

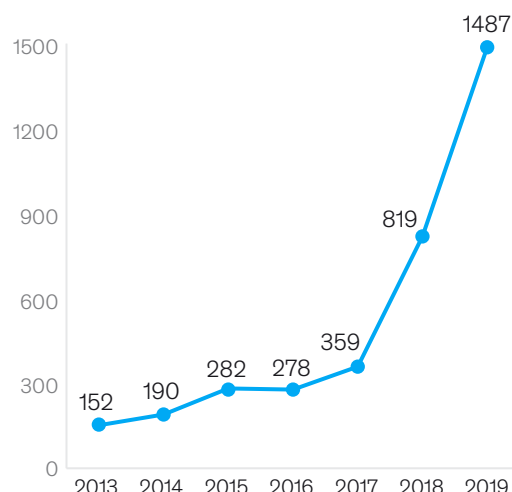
rounds, mostly thanks to the significant increase in seed rounds in 2019.<sup>64</sup>

Our analysis shows that in the period 2015–19, venture capital investment in CEE grew by a factor of five, more than twice as fast as the Digital Frontrunners and the Big 5.<sup>65</sup> However, in terms of total investment since 2013, Digital Challengers are still far behind more advanced markets (Exhibit 13). In Chapter 5 we suggest ways that policymakers can speed up improvements in order to strengthen the CEE technology ecosystem.

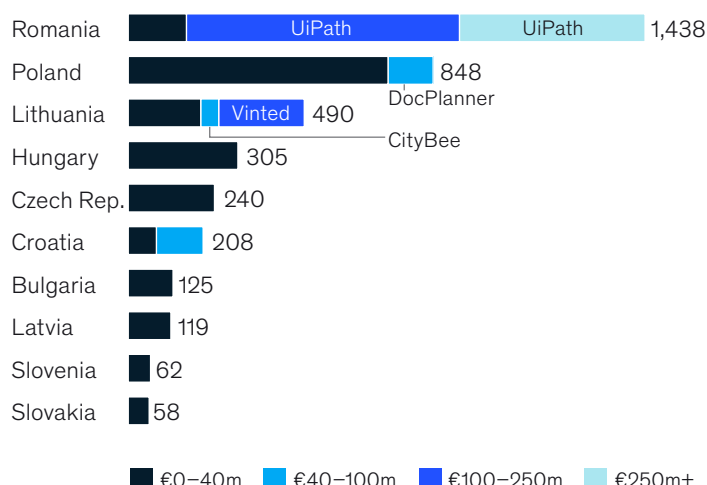
Exhibit 12

## Venture capital investment in CEE has increased considerably, mainly in Romania, Poland, and Lithuania

Total venture capital investments in Digital Challengers, 2013–20, € million



Cumulative venture capital investments by country and round size, 2013–20, € million

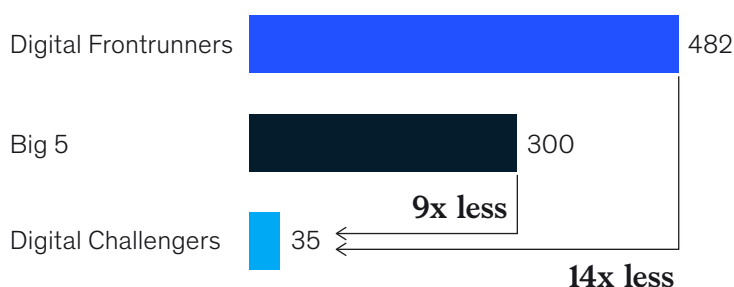


Source: Dealroom 2013–20

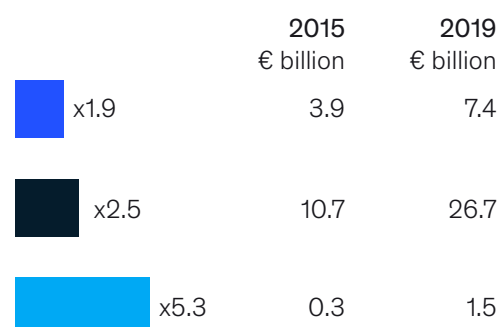
Exhibit 13

## Digital Challengers have 9 to 14 times less venture capital investment per capita than their peers; however, levels are growing fast

Venture capital investments per capita, cumulative 2013–19, €/person



Venture capital investments, 2015 vs 2019



Source: Dealroom 2013–20

## Impact of COVID-19 on CEE's digital foundations

COVID-19 has disrupted many aspects of life. The period of lockdowns, unpredictable demand shifts and economic uncertainty changed the way all actors of the economy behaved, in some cases for years to come. It is therefore worth examining the impact of the pandemic on the digital foundations in CEE, to understand which trends were caused by the pandemic and which were accelerated. This chapter looks at how COVID-19 affected the economy and education.

### Economy

The global COVID-19 pandemic is delivering a significant shock to the economy. According to recently published data, the pandemic caused the CEE economy to shrink by 10 percent in the second quarter of 2020, comparable to the decline seen in the Digital Frontrunners (down 8 percent) and the Big 5 (down 18 percent).<sup>66</sup>

According to the IMF, Digital Challengers' GDP for the full year may fall by 6.3 percent, which is less than for more advanced economies.<sup>67</sup> In terms of economic recovery in 2021, CEE countries are forecast to experience 5.8 percent GDP growth, followed by 4.9 percent in Digital Frontrunners and 4.6 percent in the Big 5.<sup>68</sup>

The economic slowdown has affected CEE countries differently. Some have been hit harder due to their reliance on tourism, such as Croatia, or on exports, such as Slovakia. The countries that experienced the highest GDP drop in Q2 2020 compared to the same period in 2019, were Croatia (down 15 percent), Hungary (down 14 percent) and Slovenia (down 13 percent).<sup>69</sup>

Even though the budget deficits are relatively small in CEE countries, low credit ratings and currency depreciation make borrowing more difficult than in more established economies. Importantly, the European Union has established a recovery fund worth EUR 390 billion to support post-COVID-19 economic recovery. On average, the recovery fund grants, over

a period of three years, are equal to 90 percent of the EU budget spent in the past seven years—an indication of the scale of the commitment. On top of this, an additional EUR 360 billion in repayable loans has been approved to facilitate recovery in EU member states.<sup>70</sup> These funds are intended to help EU countries implement national recovery and resilience plans with regard to the green and digital transitions, and the strength of national economies. The EU Commission mentions the importance of investing in digital to strengthen Europe's autonomy, including technologies such as artificial intelligence, cybersecurity, data and cloud infrastructure, 5G and 6G networks, super- and quantum computers, as well as blockchain technologies.<sup>71</sup> CEE countries thus have a unique opportunity to obtain the funds necessary for their digital transition and address the challenges in areas such as competitiveness, productivity, education, and digital skills.

### Education

The pandemic has caused countrywide school closures, affecting almost 1.6 billion children worldwide, according to UNESCO.<sup>72</sup> Going fully remote within a matter of weeks was a difficult task for schools, particularly in countries with relatively lower levels of spending on education. This is the case for CEE, where total public spending on education as a percentage of GDP is the lowest when compared with Digital Frontrunners and the Big 5.<sup>73</sup> While data from this period is limited, we have attempted to analyze how prepared the CEE education system was for remote learning; we also include a discussion of two surveys in the Czech Republic and Slovakia into the experience of teachers.

According to a survey by the OECD, the conditions for studying by children of school age, including the availability of a quiet space to study and a computer, are only two to three percent lower in CEE than Digital Frontrunners.<sup>74</sup> Nonetheless, we should keep in mind that the sample is unlikely to be representative of the whole population, and children from low-income households are

Exhibit 14

## Digital Challengers set up national e-learning platforms for students and teachers



### Lithuania

Eduka – private platform that creates a virtual classroom where teachers can create groups of students, provide exercises for them to work on, set homework assignments, and provide other relevant information



### Croatia

Skola za život – platform for distance learning and teaching created by the Ministry of Science and Education with materials divided by grade and subject area. Participants in the School for Life include 48 primary and 26 secondary schools across Croatia. For higher education, the Ministry has issued a note directing higher-education institutions to organize online classes by themselves, with central support, including a learning management system



### Romania

Manuale – launched in 2014, gives free access to digital versions of all school textbooks for all grades. It is available for students and teachers offline and online



### Poland

epodreczniki.pl – learning portal offered by the Ministry of Education, providing online learning resources

Source: Platforms' websites

likely to have worse conditions than others. Some 67 percent of CEE schools surveyed claimed that their teachers have sufficient professional resources in order to learn how to use digital applications and technology, just four percent lower than Digital Frontrunners. The same survey showed that the availability of online platforms is 37 percent lower in CEE than in Digital Frontrunners. Indeed, while some of the CEE countries already have online educational content in place (Exhibit 14), there is still potential to strengthen the e-learning offerings across the region.

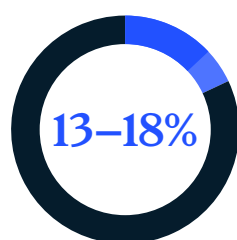
The two surveys carried out in the Czech Republic and Slovakia shed some light on the experience of teachers during the pandemic (Exhibit 15). In the Czech Republic only 13 percent of elementary schools (Classes 1-4) used any form of digital learning before the pandemic broke out.<sup>75</sup> Nonetheless, the majority of elementary schools surveyed—81 percent—managed to actively communicate with pupils remotely.

In Slovakia, 77 percent of teachers claimed that it took them less than two weeks to start remote learning, however, an equal proportion of them had to use their own equipment to do so rather than equipment belonging to their schools.<sup>76</sup> Both Czech and Slovak teachers admitted that remote education was much more difficult than traditional in-class teaching. In Slovakia, the two most important factors for online teaching were considered IT skills (81 percent) and equipment (74 percent).<sup>77</sup> Teachers in both the Czech Republic and Slovakia expressed a willingness to learn new tools and skills in order to be more prepared for remote education. This is a positive sign, and even though most children from the region returned to schools in September, the future is volatile: the education system must be prepared for possible disruption caused by future waves of the virus. Now, it would appear, is the time to rethink how children should be exposed to knowledge in the digital age.

Exhibit 15

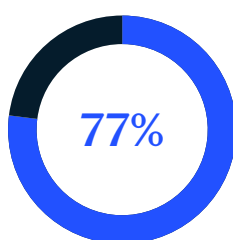
### Teachers in CEE had to quickly adjust to the new reality, despite little prior experience and limited technical support

#### Czech Republic

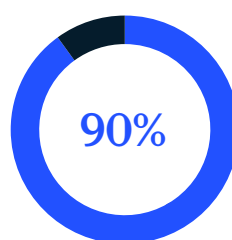


Teachers who used remote learning on regular basis before COVID-19

#### Slovakia



Teachers who used their own equipment for remote teaching



Teachers who consider remote education "difficult" or "very difficult" compared to traditional education

# ~1.6bn

children affected worldwide as a result of governments' closing schools in response to COVID-19 spread according to UNESCO

Source: Survey by the Dionýz Ilkovič Foundation, [www.nadaciadi.sk/lepsie-skolstvo/ucitelia-online-vyuku-zvladli-no-museli-si-pomoc-ako-vedeli-vychadza-z-prieskumu-pocas-pandemie-covid-19/](http://www.nadaciadi.sk/lepsie-skolstvo/ucitelia-online-vyuku-zvladli-no-museli-si-pomoc-ako-vedeli-vychadza-z-prieskumu-pocas-pandemie-covid-19/); survey by the Czech School Inspectorate : <https://www.csicr.cz/getattachment/a17f4484-8f2f-4331-bc5e-3e49219b45c3>





Bulgaria

# 03

## Labor market in CEE

Historically, the long-term growth of GDP in CEE countries has been driven by two factors: improvements in productivity, and increases in employment. With pre-pandemic unemployment at historically low levels, there is growing concern that the workforce may now be reaching its peak, making it unable to contribute to the further development of CEE economies. Moreover, demographic trends such as the aging population and overall population decline, paired with the change in demand for certain jobs due to digitization and automation, could in the long term lead to a shortage in the workforce in certain industries and structural unemployment.

In this chapter we analyze the state of the labor market up to the end of 2019. We then shift our focus to the more recent disruptions caused by COVID-19. We pay close attention to remote working, a new trend that emerged as a consequence of restrictions during the pandemic, which has the potential to affect the way we work in the future. The rise in remote working not only sped up digitization at companies, it may also lead to increased labor participation by women, young people, and those living outside of urban centers. As such, it could to some extent help governments and businesses deal with the pressure created by a declining workforce.



# 9.9m

jobs in CEE are at risk due to the pandemic

## The labor market before COVID-19

The population in CEE has declined by six percent over the past two decades. In the same period, the population of Digital Frontrunners grew by 13 percent, and that of the Big 5 by nine percent.<sup>78</sup> Given that the fertility rates for all three regions are comparable (Digital Challengers: 1.59; Digital Frontrunners: 1.61; Big 5: 1.53)<sup>79</sup>, this is largely the result of migration. Western and Northern Europe have enjoyed positive net migration for years, while immigration did not overtake emigration for Digital Challengers until 2018, the first time in over three decades.<sup>80</sup> In terms of age distribution, CEE countries have the highest proportion of people of working age (15–64) and the lowest proportion of people of retirement age (over 65).<sup>81</sup>

The unemployment rate in CEE has been declining steadily over the years, dropping below levels of the Big 5 in 2011 and Digital Frontrunners in 2016. It reached a historical low of 4.6 percent in 2019.<sup>82</sup> However, Digital Challengers are outpaced by their peers in terms of net job growth: in 2014–19 the rate was less than half that of Digital Frontrunners.<sup>83</sup> In terms of labor participation by different groups, the gap between the employment of women and men in CEE is almost double that of Digital Frontrunners.<sup>84</sup>

## Short-term effect of COVID-19 on the labor market

### Jobs at risk due to COVID-19

In our previous Digital Challengers reports, we focused our discussion of the labor market on the opportunities and risks presented by automation, drawing on forecasts by the McKinsey Global Institute (MGI). Our finding was that up to 51 percent, or 21 million jobs, were at the risk of being potentially automated by 2030. While these numbers are alarmingly high, it is important to remember that they only refer to potential job losses—the technical feasibility of workplace activities to get automated based on currently demonstrated technologies, not accounting for other important

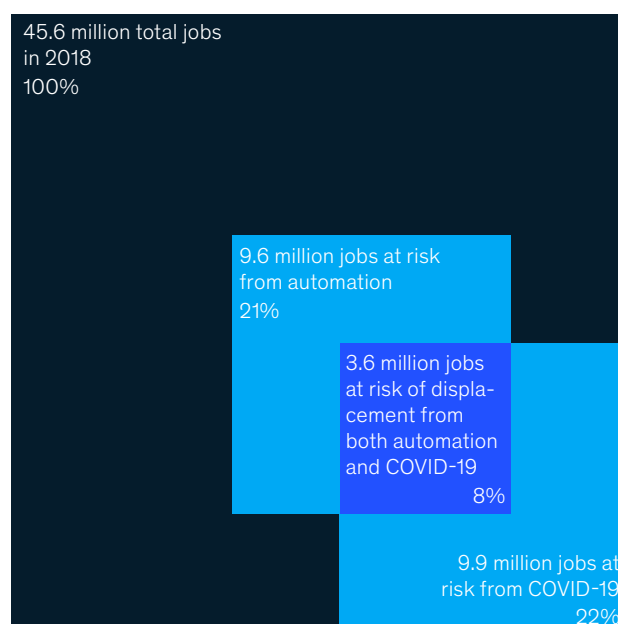
factors such as solution development and integration, economic feasibility of automation deployment, and other social, regulatory, and implementation barriers. Automation adoption accounts for all these stages and provides a more realistic picture of expected workforce automation. In CEE, adoption of automation is forecast to reach 21 percent, or 9.6 million jobs by 2030, in the midpoint automation adoption scenario.<sup>85</sup>

According to a new analysis by MGI, a similar number of jobs in CEE are at risk due to the pandemic: around 9.9 million<sup>86</sup> (Exhibit 16). Furthermore, there is an overlap of around 3.6 million jobs that are at risk in the short term due to COVID-19 and in the long term due to automation. This can be attributed to the fact that lockdowns and other safety measures imposed during the pandemic mostly affect physical workers and those working directly with customers. Indeed, the sectors that have the most jobs at risk from both automation and COVID-19 are wholesale and retail trade, manufacturing, construction, and accommodation and food services.

The impact of the pandemic on the labor market varies significantly depending on the sector, company size, and employee age and level of education. In CEE, around 65 percent of all jobs at risk due to COVID-19 are in customer service and sales, construction, food services, and office support (Exhibit 17). Education level has a significant impact on short-term job risk: 8.1 million jobs at risk (82 percent of total jobs at risk from COVID-19) are held by employees without tertiary education. Employees without tertiary education are almost three times as likely to be at risk than those with tertiary education. In terms of different age groups, the jobs at risk are distributed relatively uniformly between employees aged 25 to 54, who account for 7.7 million jobs at risk (78 percent of total jobs at risk from COVID-19). Employees aged 15 to 24, however, are at a significantly higher risk than older employees, which implies a danger of youth unemployment in CEE increasing.

## A large overlap exists between jobs at risk due to COVID-19 in the short term and jobs potentially displaced by automation in the longer term

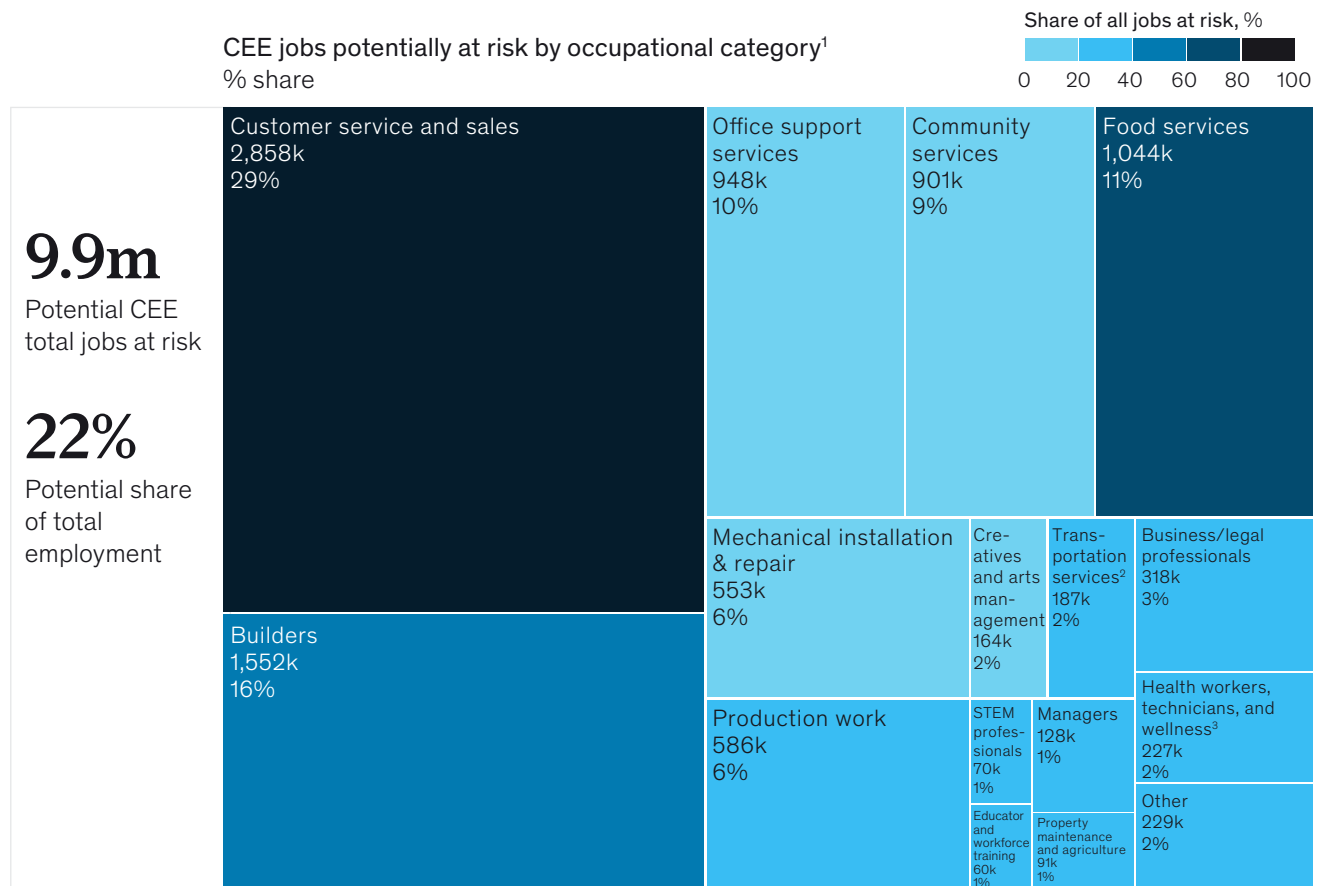
Digital Challenger countries



| Jobs at risk of displacement from both COVID-19 and automation<br>'000 |     | % of jobs potentially displaced by automation | Correlation coefficient <sup>1</sup> |
|--|-----|---|--------------------------------------|
| Wholesale and retail trade   | 805 | 61%   | 95%                                  |
| Manufacturing  | 723 | 23%   | 26%                                  |
| Construction   | 461 | 61%   | 86%                                  |
| Accommodation and food services  | 361 | 94%   | 95%                                  |
| Transportation and storage   | 243 | 43%   | 63%                                  |
| Public administration and defense                                      | 179 | 36%   | 82%                                  |
| Human health and social work   | 138 | 41%   | 47%                                  |
| Education  | 120 | 36%   | 44%                                  |
| Administrative and support service                                     | 115 | 59%   | 95%                                  |
| Agriculture  | 111 | 12%   | 83%                                  |
| Professional services  | 95  | 36%   | 34%                                  |
| Finance and insurance  | 69  | 40%   | 52%                                  |
| Arts   | 66  | 80%   | 68%                                  |
| Other services   | 60  | 52%   | 67%                                  |
| Information and communication  | 26  | 12%   | 12%                                  |
| Water supply, sewerage   | 18  | 27%   | 27%                                  |
| Electricity  | 16  | 27%   | 55%                                  |
| Real estate  | 13  | 31%   | 33%                                  |

1. Correlation between jobs at risk due to COVID-19 and jobs displaced due to automation at the aggregate level is highly significant ( $r = 0.76$ ;  $p = 0.00$ ).  
 Note: Includes Digital Challengers Bulgaria, Croatia, Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia; jobs displaced are based on midpoint automation scenario. Analysis of long-term labor market trends and impact of automation was conducted before COVID-19 pandemic; we define "jobs at risk due to COVID-19" as a reduction in hours or pay, temporary furloughs, or permanent layoffs; analysis determines jobs at risk as related to physical-distancing policies and their short-term knock-on economic consequences. "Jobs at risk from automation" refers to jobs whose constituent work activities are highly susceptible to being displaced by automation adoption.  
 Source: LaborCUBE; Eurostat; McKinsey analyses

65% of all jobs at risk due to COVID-19 in CEE are in customer service and sales, construction, food service, or office support services



Note: Figures based on estimated jobs at risk due to social-distancing policies and their immediate economic consequences; assumes level of social distancing based on state policies.

1. Based on the job cluster framework defined by the McKinsey Global Institute.

2. Excl. commercial transportation jobs, eg., heavy trucking and lorry driving (included in "production work" job cluster).

3. Includes health professionals.

Source: LaborCUBE; Eurostat; BLS OES; McKinsey Global Institute

## Early signs of the impact of COVID-19 on the labor market

With widespread lockdowns in place, businesses had to take action in order to survive periods of low or even zero commercial activity. Measures included layoffs, reduced working hours, and salary cuts. The data from the first half of 2020 is still fairly limited, and the impact of the pandemic on the labor market will no doubt become more visible in the coming months. However, we have gathered what information is already available in order to draw an early picture of the disruptions caused by the pandemic.

Among Digital Challengers, Digital Frontrunners, and the Big 5, more than 850,000 people have lost their jobs

since January 2020.<sup>87</sup> The number of people unemployed has risen by 22 percent among Digital Challengers and 20 percent among Digital Frontrunners, but just two percent in the Big 5. The figures started rising from March 2020 onward, the month when most countries entered lockdowns. In CEE, the three countries experiencing the biggest drops in employment are Latvia, Lithuania, and Croatia, where unemployment is currently between nine and ten percent, following an increase of more than 40 percent between March and June. In Latvia and Lithuania, the biggest increase in unemployment was for highly qualified workers in the capital cities, whereas in Croatia the tourist industry accounted for the largest share of the increase.<sup>88</sup>

The large discrepancy between the Big 5 and the other two regional groups in terms of growth in unemployment may be due to the fact that the Big 5 were, of course, already experiencing high unemployment rates prior to COVID-19. The Big 5's baseline unemployment rate in March 2020 was almost seven percent, 41 percent higher than that of Digital Frontrunners and a full 82 percent higher than that of Digital Challengers<sup>89</sup> (Exhibit 18). Because unemployment has been a long-standing issue for the Big 5 countries, they introduced measures that shielded them from higher job losses during COVID-19. These were generally different types of subsidies that covered workers' salaries, such as Kurzarbeit in Germany,<sup>90</sup> the partial-activity scheme in France,<sup>91</sup> furlough in the United Kingdom,<sup>92</sup> and basic income for the poor in Spain and Italy.<sup>93</sup>

According to a Eurofound survey of more than 62,000 Europeans, one-fifth of CEE citizens surveyed claimed that they had lost their job contracts, either temporarily or permanently. The figure for the Big 5 was 23 percent lower, whereas for Digital Frontrunners it was 51 percent lower. The research

also shows that many people fear losing their jobs in the future. Almost one-third of CEE citizens responded that they could lose their jobs, almost twice the level of Digital Frontrunners.<sup>94</sup> Clearly, perceived job security is much lower in the CEE region than among Digital Frontrunners, even though the actual unemployment figures are comparable.

In terms of the size of different stimulus packages, the Big 5 was well ahead of the other regions, spending 33 percent of its GDP on economic assistance, compared to 13 percent in the CEE and 17 percent among Digital Frontrunners (Exhibit 19). Clearly, CEE countries could consider maintaining or increasing their support packages in order to avoid prolonged double-digit unemployment.

### Remote work is the next normal

The pandemic saw a sudden shift to remote work, with around 30 percent of the CEE workforce starting to work from home.<sup>95</sup> This shift was much smaller than in some European countries, however, where 40–50 percent switched to remote work. One of the reasons for these differences is likely to be that employees in CEE countries had little experience of their employees

working from home in the past, and so had a more difficult time adapting to the new situation: prior to COVID-19, just nine percent of the workforce in CEE worked remotely, almost 70 percent lower than among Digital Frontrunners.

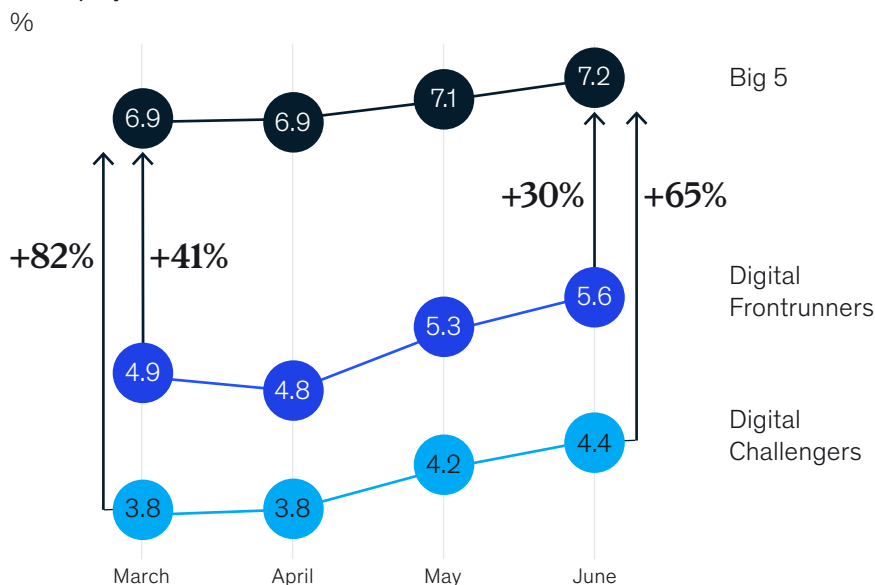
While the shift to remote work was driven by necessity, this model of operating has plenty of benefits that might make business owners consider prolonging it beyond the end of the pandemic. Some companies are already planning a new combination of remote and on-site working, a hybrid virtual model in which some employees work on the premises and others work from home. This new model promises greater access to talent, increased productivity for individuals and small teams, lower costs, more individual flexibility, and improved employee experiences.<sup>96</sup>

Remote work removes geographical barriers and so provides greater access to talent. This could, on one hand, strengthen their competitive advantage through higher labor participation of currently disadvantaged groups in the labor market. On the other hand, this could allow for easier brain drain, as the international job opportunities become relevant for the local talent pool as well.

Exhibit 18

## Unemployment grew fast for Digital Challengers and Digital Frontrunners, but is still 30–65% higher in the Big 5

Unemployment rate, Mar–Jun 2020

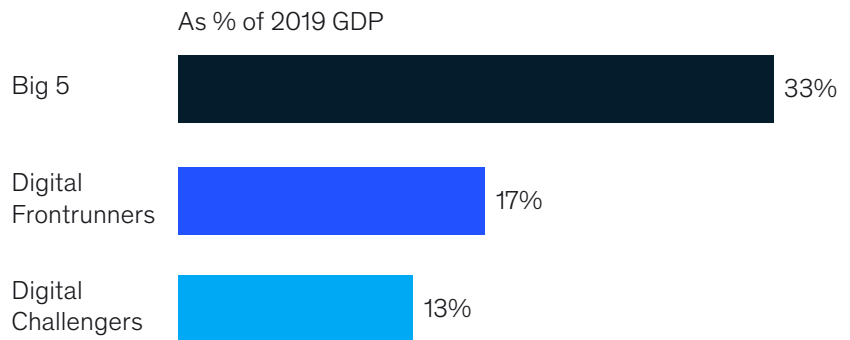


Source: Eurostat; McKinsey analysis

#### Exhibit 19

### Economic assistance packages in CEE were much smaller than elsewhere

Size of stimulus packages  
(incl. monetary and fiscal measures)



Source: Government websites; press clippings

According to a survey by Gartner, more than 74 percent of CFOs believe that at least five percent of their workforce will remain permanently remote post-crisis.<sup>97</sup> This trend is reflected in CEE. One telecommunications operator in CEE, for example, is planning to keep their call-center employees working remotely after the pandemic, believing that it will allow them to tap into a new talent pool from outside the big cities.

A survey carried out by the largest online work platform in Poland,

Pracuj.pl, provides some insights into the employee perspective. According to the research, approximately 90 percent of respondents would like to continue working remotely, but most of them would still like to be able to access the office once a week or just a few days a month<sup>98</sup> (Exhibit 20). In terms of why people like working from home, the respondents in the Polish survey said that it gave them greater flexibility with regard to working hours, limited the time spent commuting, and allowed them to combine work and

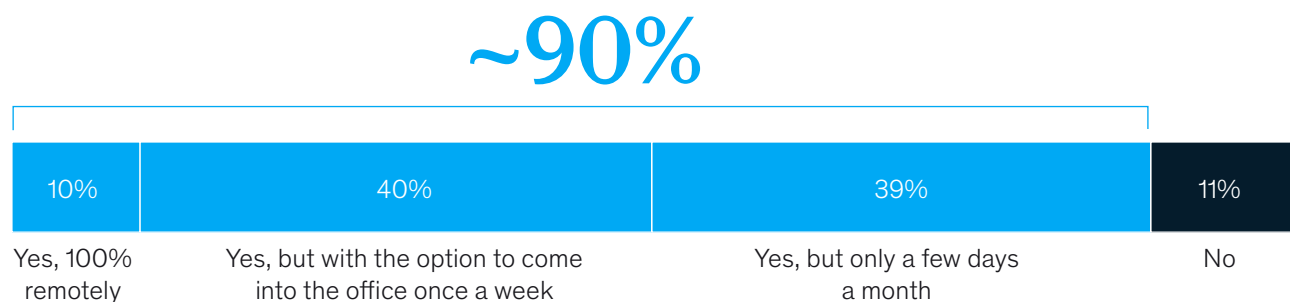
home responsibilities. At the same time, they admitted that working remotely required much more self-discipline due to distractions and the blurring of lines between their work and private lives. Most believe that remote work skills will become more important as companies offer more such opportunities in the future. This supports the view that companies might want to look into remote working models, and in particular the hybrid model, when adjusting their operations to the next normal.

#### Exhibit 20

### Around 90% of Poles would like to continue working from home, but only 10% would like to do so 100% of the time

Would you like to work remotely after COVID-19 restrictions are lifted?

n = 683; online survey of users of Pracuj.pl, 2020



Source: Grupa Pracuj; Rzeczpospolita, May 2020





Zagreb, Croatia

# 04

## The impact of COVID-19 and early responses across CEE

In the preceding chapters we focused on how the digital fundamentals and labor market in CEE have fared during the pandemic so far. We now turn to the impact of COVID-19 on different economic actors, including individuals, businesses and policymakers. We also explore the increased digital adoption that the pandemic has triggered, giving some examples of early responses by different stakeholders.

### Individuals

The number of people in CEE who have accessed at least one online service has risen 15 percentage points in the first six months since the start of the COVID-19 pandemic, according to figures from the McKinsey COVID-19

Digital Sentiment Insights survey (Exhibit 21). At the first peak of the pandemic in March, there were almost 12 million new users of online services—more than the populations of Slovakia, Croatia, and Slovenia put together. Prior to the pandemic, 61 percent of consumers used digital services; following the lockdown imposed in various countries, that figure had grown to 76 percent.

Our survey reveals rapid digital adoption by all age groups and geographies, not just traditional early adopters—young professionals living in large cities. Younger generations (people aged 18–44) led the way with regard to digital adoption in all countries in CEE, both before and



# 12m

new online service users in CEE

# 3.6m

new online service users in Poland

# 40%

increase in the number of people over age 65 accessing online services, the highest among all age groups

after lockdowns were imposed. But the digital adoption rate also grew significantly during lockdown for consumers aged over 65, their increased level of medical risk giving them a strong incentive to access services online. In fact, this age group showed the strongest growth across the region, with user numbers increasing by a factor of 1.4.

Furthermore, our research found that the number of online services in different sectors accessed by CEE consumers has almost doubled since the start of the pandemic. Prior to the pandemic, the total number of different online services accessed by consumers was above two; now, it is above four. The most popular online services in CEE are banking (accessed by 59 percent of consumers) and telecommunications (45 percent) (Exhibit 22). This comes as no surprise: these two sectors had been investing significantly in digitization for

several years prior to the pandemic. The number of consumers accessing government services online has more than doubled, but these services receive the lowest satisfaction ratings from users. An uptick in e-commerce is also visible, with the number of consumers using online channels for grocery shopping doubling, and for retail as a whole growing by a factor of 1.7. Entertainment, too, has doubled its number of users, with 39 percent of consumers accessing services at least once during the pandemic. Digital penetration is lowest for the insurance sector (accessed by 21 percent of users) and the travel industry (17 percent); here, much room for improvement remains. However, given the travel restrictions that were in place, low use of digital channels in the travel industry, at least, comes as no surprise.

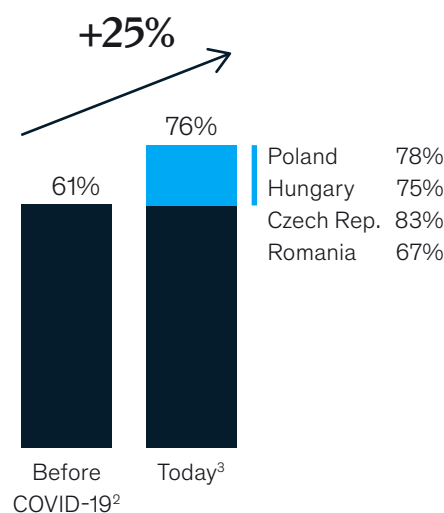
In terms of user experience, 88 percent of people who accessed digital services

Exhibit 21

## Three out of four people in CEE are now digitally engaged

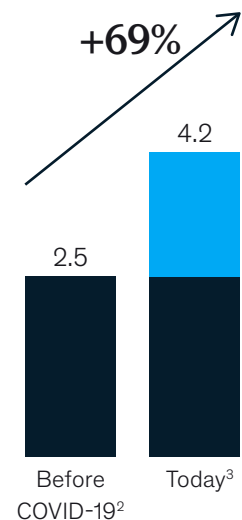
### Digital adoption in CEE

Share of users that accessed at least one service



### Use of digital channels

Number of sectors accessed digitally of the 10 surveyed<sup>1</sup>



1. Sectors: banking, insurance, grocery, apparel, entertainment, social media, travel, telecommunications, utilities, public sector.

2. Before COVID-19 has been determined as the difference between the usage of digital during last 6 months and the usage of digital specifically during COVID-19.

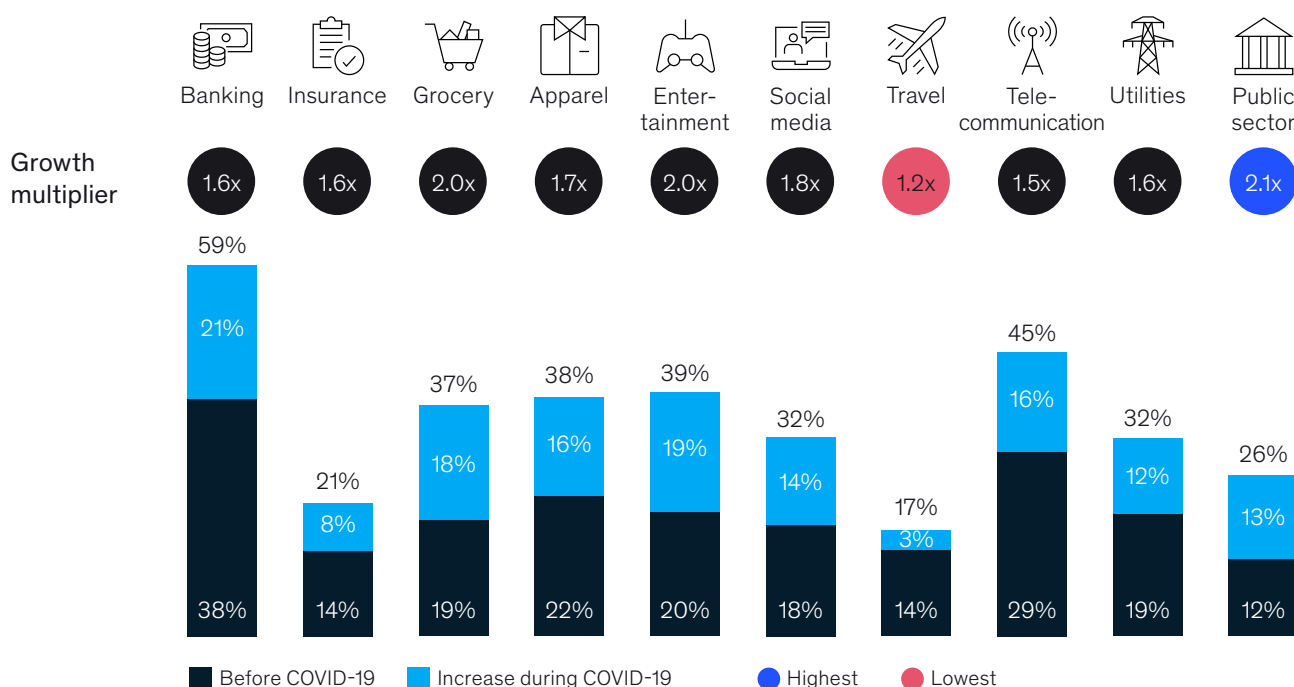
3. Today includes the industries visited digitally during the last 6 months.

Source: McKinsey & Company COVID-19 Digital Sentiment Insights; survey results for the Czech Republic, Hungary, Poland, and Romania

## The public sector saw the biggest increase in digital adoption out of all sectors

### Digital adoption by sector

Share of users that accessed at least one service from the sector in question in the last 6 months, %



Source: McKinsey & Company COVID-19 Digital Sentiment Insights; survey results for the Czech Republic, Hungary, Poland, and Romania

said that they were either “satisfied” or “very satisfied” with the service. The main source of dissatisfaction was the difficulty of using digital services. The second most-common issue was the fact that online channels did not have a full range of products on offer (Exhibit 23). Although almost 70 percent of people across the European Union said that they would be willing to continue using digital services at the same or an even higher level after the pandemic, businesses and governments are well advised to act to keep their customers satisfied. COVID-19 has forced private and public bodies to digitize at an accelerated rate; now and in the coming months, they may want to focus on gathering feedback, making customer journeys simpler, and ensuring the migration of their product and service offerings to online channels.

#### Businesses

In our analysis of the impact of COVID-19 on the private sector,

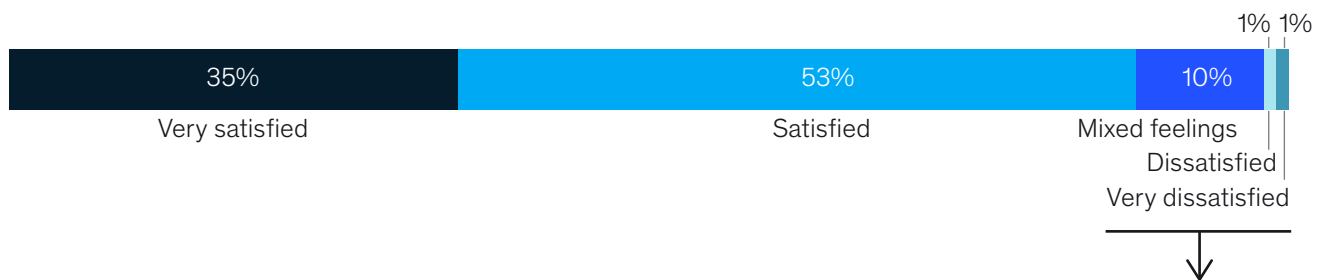
we intentionally focus on small and medium-sized enterprises (SMEs) in CEE, that is, companies with fewer than 250 employees. These companies form the backbone of the economy in terms of both their financial contribution and job creation. Indeed, 99 percent of businesses in CEE are SMEs, and they account for more than two-thirds of all jobs.<sup>99</sup> There are also good reasons to believe that SMEs are more vulnerable to the impact of the pandemic due to potential liquidity issues, their limited ability to sustain supply chains, and their lower rate of digitization.<sup>100</sup>

While data on SMEs from the first half of 2020 is limited, we can gain some insights from The COVID-19 Business Pulse Survey, conducted in Poland by World Bank Group and the Polish Agency for Enterprise Development (PARP) between May and July 2020. Almost 70 percent of the small businesses surveyed experienced a drop in revenues.<sup>101</sup> The average

## Most customers—88 percent—are satisfied with their digital experience; ease of use is the main lever for improving customer satisfaction further

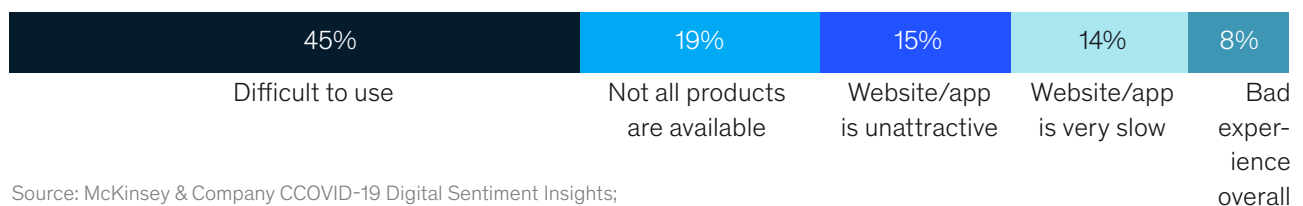
Question: How satisfied are you overall with the digital services that you are using during the COVID-19 crisis?

Average degree of satisfaction, %



Question: What are the main reasons for your dissatisfaction?

% of users by reason for dissatisfaction



Source: McKinsey & Company CCOVID-19 Digital Sentiment Insights; survey results for the Czech Republic, Hungary, Poland, and Romania

decrease in sales was around 30 percent.<sup>102</sup> The top three problems mentioned by Polish companies in the survey were decline in demand (58 percent), cash flow problems (44 percent) and limitations on hours of operation (29 percent).<sup>103</sup> To sustain their business, the owners of small companies also had to adjust their workforce, reducing hours, putting staff on paid leave, and reducing salary levels.

Another important lever that SMEs used to stay afloat was digitization. Around 32 percent of companies stated that they had increased their use of digital tools and platforms, and 18 percent said they had invested in new hardware or software.<sup>104</sup> Nevertheless, more than one-fifth of companies said that they could continue operating for a maximum of three months without facing bankruptcy unless the economic situation improved.<sup>105</sup>

### Digitization of SMEs

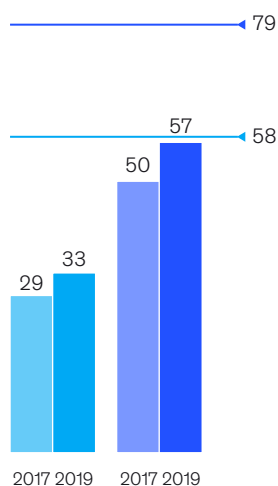
For the majority of small businesses, being online was the only way to continue their commercial activity during lockdown. So, it is worth examining how prepared they were to make this transition. Overall, SMEs in CEE lag behind large enterprises in terms of their digital adoption, with digitization rates half their levels (Exhibits 24 and 25).<sup>106</sup> In CEE, 68 percent of SMEs had a website prior to the pandemic, but only 27 percent of those websites had a “shopping cart” functionality allowing online shopping or booking.<sup>107</sup> By contrast, among Digital Frontrunners, 85 percent of companies had websites, of which 31 percent had an e-shop, while in the Big 5, 78 percent had websites, of which 24 percent had e-shops. Thus, while SMEs in CEE are less likely to have their own websites, those that do are more likely than those in the Big 5 to have an online shop, too.

## SMEs in Digital Challenger countries did not increase their online advertising, and they are still behind Digital Frontrunners

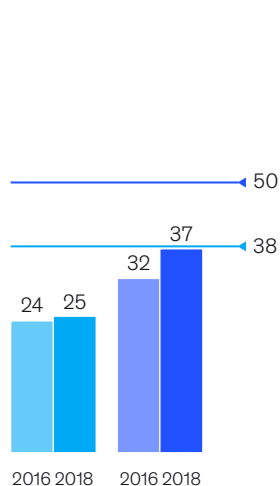
### Generating sales, % of companies

#### Connecting in real time

Using social media for branding and marketing, 2019

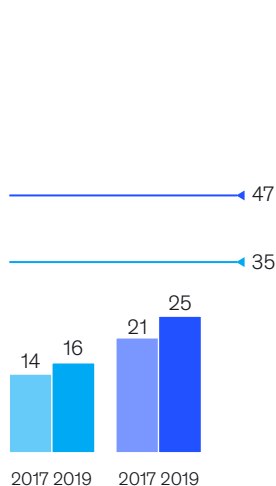


Paying to advertise on the Internet, 2018



#### E-commerce sales overall

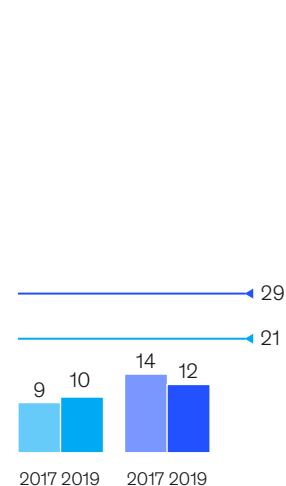
Selling online, 2019



Large enterprises, overall average (latest year available):

— Digital Challengers  
— Digital Frontrunners

Share of revenues from selling online, 2019

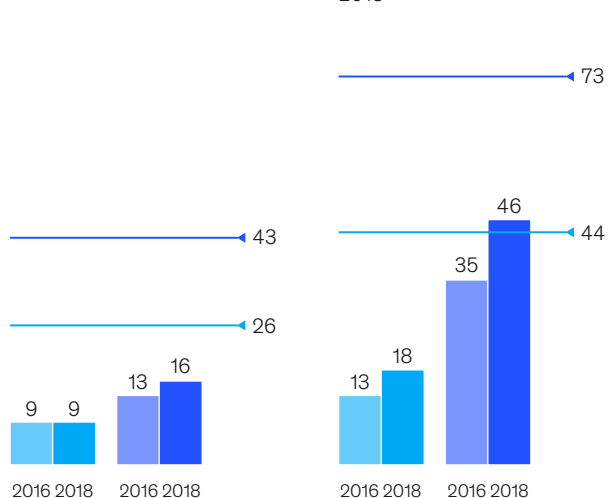


Use of cloud by SMEs in Digital Challenger countries increased by 5 points from 2016–18, but Digital Frontrunners are still ahead by 28%

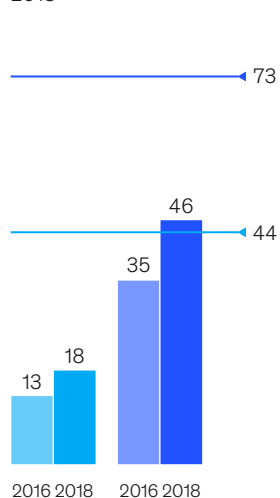
### Optimizing operations, % of companies

#### Advanced analytics for decision making

Analyzing big data, 2018

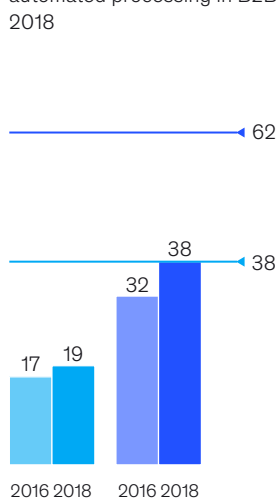


Using cloud computing tools, 2018

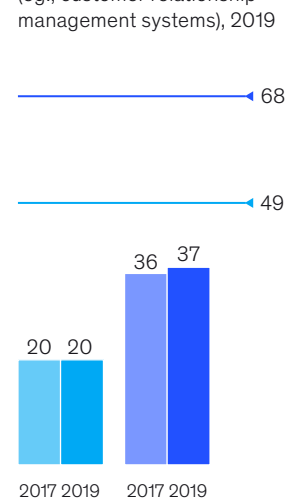


#### Streamlining and automating processes

Sending e-invoices suitable for automated processing in B2B, 2018



Using software solutions (eg., customer relationship management systems), 2019



Although digital adoption by SMEs in CEE has increased in the last two years, the gap between the region and Digital Frontrunners remains, particularly in the area of online advertising, including social media for branding and marketing.<sup>108</sup> In terms of leveraging online channels as a source of revenues—an activity that is especially important during the pandemic—there is a nine to 12 percent gap between Digital Challengers and Digital Frontrunners for both SMEs and large companies.<sup>109</sup> When it comes to cross-border online sales of SMEs, Digital Challengers grew the fastest since 2017.<sup>110</sup> In 2020, CEE shows a higher percentage of cross-border online sales by SMEs than the Big 5 (8.3 percent in CEE and 7.6 percent in the Big 5), with a gap to Digital Frontrunners remaining at almost four percentage points.<sup>111</sup> Cloud adoption in CEE grew by five percent in the period 2016–18,<sup>112</sup> but that is still only half the growth rate seen among Digital Frontrunners. With 18 percent of CEE's SMEs utilizing cloud computing tools in 2018, the gap between them and the Digital Frontrunners is 28 percentage points, indicating significant potential for improvement. The use of tools such as e-invoices, Big Data analytics and customer relationship management (CRM) by SMEs in CEE also lags far behind their use by SMEs in Northern Europe,<sup>113</sup>

### E-commerce

In the following paragraphs we discuss the impact of the pandemic on two specific sectors: e-commerce, which experienced significant growth during the lockdown, and manufacturing, which suffered from major production-line shutdowns. We also present a number of examples in terms of responses to the crisis (Exhibit 26).

Before COVID-19, e-commerce in CEE was increasing steadily, at 18 percent per year, outpacing both the Digital Frontrunners (13 percent) and the Big 5 (11 percent).<sup>114</sup> In April 2020, with the pandemic well underway, e-commerce revenues in CEE achieved a staggering 73 percent year-on-year growth, compared to 25 percent in the Digital Frontrunners and the Big 5.<sup>115</sup> As per

## Exhibit 26

### Companies are adapting to the next normal



#### InPost

InPost is a leading Polish provider of logistics services. It introduces the first network of self-service parcel lockers and streamlined the processes of parcel delivery and collection.

#### Implemented solutions:

For people using courier delivery, InPost offers the option of collecting parcels using a pickup code, eliminating the need to physically sign for them

Due to COVID-19, InPost hastened the launching of its 24/7 work mode, with the possibility of deliveries to parcel machines on weekends

InPost launched a new offer for local authorities, InPost Urząd 24, which makes possible the settling of legal matters despite offices being closed



#### Rohlik.cz

Rohlik.cz is the largest e-grocery store in the Czech Republic. During COVID-19 it expanded its logistics capabilities, hiring drivers from other industries that were forced to shut down. It also partnered with a taxi company to deliver orders.

#### Two new brands created:

- Suchý rohlík (now discontinued)
  - Delivered durable food and pharmaceutical products across the whole country, whereas main brand works in selected areas only
  - This product was discontinued at the end of May as the restrictions imposed by the government eased
- Rohlík bistro
  - Meal deliveries from well-known Prague restaurants



#### Moj-eRačun

Moj-eRačun is a Croatian IT company for e-invoice services. It launched an AI chatbot to support its customer support team on technical issues regarding e-invoicing. The chatbot successfully resolved 92 percent of customer inquiries (more than 1,500 questions and 6,500 messages). Only around 90 questions required referral to live support.

The company has worked intensively on developing new paperless services, fully digitizing business processes and developing its AI chatbot since the beginning of 2020.

Source: rohlik.cz and Mediar, Nakup bezpečně, Suchý Rohlík, Rohlík Bistro, Rohlík Mini. Čupr to rozjíždí ve velkém, Bohuslav Bohunek, March 2020; www.mediar.cz/nakup-bezpecne-suchy-rohlik-rohlik-bistro-rohlik-mini-cupr-to-rozjizdi-ve-velkem/; www.netokracija.com/andjelka-chatbot-moj-e-racun-168866

our COVID-19 Poland Consumer Pulse survey, as a result of the pandemic, customers started using online channels to buy households essentials like household supplies and personal-care products, a product group that was previously sold predominantly through physical stores.<sup>116</sup>

For many businesses, customer interaction patterns shifted significantly under lockdown. Some companies innovated, expanding their business models and making strategic decisions at a pace hard to imagine prior to COVID-19. For example, Booksy, a Poland-based application for finding, scheduling, and managing appointments, had mainly focused on the beauty sector prior to the pandemic. The impact of the lockdown on the company was massive: it saw a 90 percent drop in activity on its application. But within a few weeks, the company had managed to expand its business model by forming partnerships with numerous banks, an electronics chain, and other businesses, enabling users to make appointments with these organizations without the need to physically wait in line—something that was especially important due to the pandemic. Thanks to its quick reaction, Booksy saw a 25 percent increase in visitor numbers, with ten percent of them making use of the new services offered. As for many other companies, the initial situation during the pandemic was not easy for Booksy, and they had to review their

cost base and even terminate some of their employees' contracts. But after rethinking their business model, they were able to hire new specialists to help with their expansion and continue along their growth trajectory.

Companies are also showing greater interest in online channels as a way of staying engaged with their existing customer base. For example, Allegro, the most popular online shopping destination in Poland and the tenth most popular in the world, increased the number of its partners by 15,000 between April and June 2020,<sup>117</sup> achieving in those three months three-quarters of the level of growth it had seen in the whole of 2019.<sup>118</sup> Similarly, Mall Partner, the online marketplace of a leading Czech e-commerce player, saw its partner network grow three times faster after COVID-19-related restrictions were imposed.<sup>119</sup>

There are various examples of e-commerce players' response to the pandemic. Allegro introduced three-months' of free delivery for people using Allegro Smart!<sup>120</sup> or an Allegro helpline<sup>121</sup> for seniors. Empik, one of the biggest e-commerce players in Poland,<sup>122</sup> made its Empik Premium version free for two months during the pandemic, and also supported education through making most of the required reading available online.<sup>123</sup>

### Manufacturing

Owing to factory shutdowns, production in CEE was down 33

percent at the peak of the lockdown in April 2020.<sup>124</sup> Many production facilities had to stop operating: in the European automotive industry, for example, the average shutdown period was more than a month.<sup>125</sup> According to McKinsey's Global Manufacturing & Supply Chain Pulse Survey, 31 percent of companies have faced challenges related to worker shortages during COVID-19.<sup>126</sup>

Before COVID-19, Industry 4.0—including connectivity, advanced analytics, automation, and advanced-manufacturing technologies—was gaining momentum, as companies transformed their operations in areas ranging from production efficiency to product customization. Industry 4.0 has become even more critical during the COVID-19 crisis. Indeed, players that had already implemented digital solutions were better positioned to navigate the crisis, as they were able to move faster and further than their peers.<sup>127</sup>

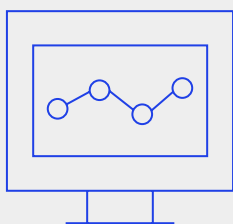
From e-commerce to manufacturing, speeding up the adoption of quick-win solutions can help companies respond and adapt to the new norms. That includes solutions such as tracking employee health, enforcing safe distancing on the shop floor and supporting remote collaboration. Leveraging these solutions can increase companies' resilience to shocks such as those experienced since the outbreak of the virus.

### Case study

## How Henkel's digital solutions prepared them for COVID-19

Prior to the outbreak of COVID-19, chemical and consumer goods company Henkel had already installed sensors across its production facilities.<sup>128</sup> The data gathered from more than 30 production sites and ten distribution centers was combined with multiple other data sources and integrated into Tableau dashboards,

providing real-time visibility across all major KPIs. During the pandemic this has been particularly useful. For instance, one such dashboard monitors the company's global stock of personal protective equipment (PPE), ensuring employees are properly protected across facilities, while another provides real-time visibility over material shortages. This enables Henkel to correct any problems that arise on an ongoing basis and reorganize supply chains flexibly in the event of disruption.





## Public sector

Digitization of the public sector has long been an objective for policymakers. CEE governments, with the exception of Estonia, Latvia, and Lithuania, however come right at the bottom of the DESI index for digital public services (Exhibit 27). Worse still, over the past five years the gap between CEE and Digital Frontrunners has closed by just two percentage points, from 22 to 20 percent, indicating a lack of significant progress.<sup>129</sup>

In the past, digital public services were considered a “nice to have”; now, with COVID-19, they have become a necessity. Several CEE countries

have indeed developed multiple digital government solutions in response to the first wave of the pandemic. The Latvian parliament was one of the first in the world to create and start using a completely remote solution to work during the pandemic.<sup>130</sup>

The Croatian Financial Agency (FINA) was also quick to develop its “COVID score” feature, a digital scoring mechanism that determines how vulnerable a company is due to the pandemic by linking multiple government databases.<sup>131</sup> This helps determine the company’s need for additional financing and is used for processing applications for different types of state

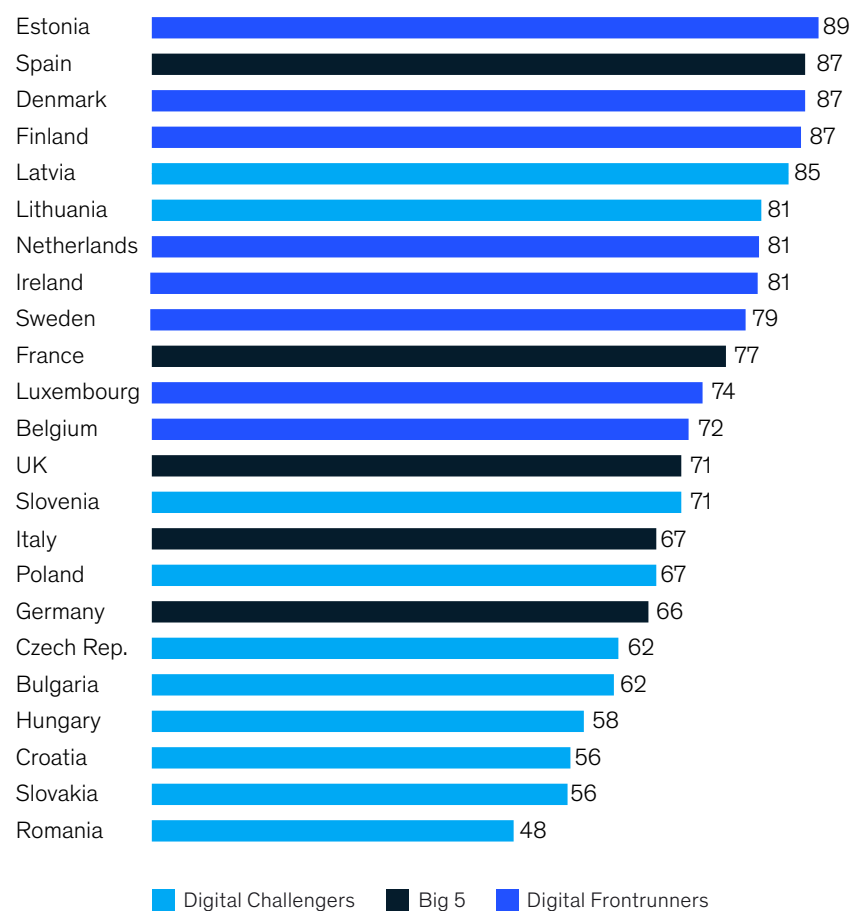
support, measures for job retention, tax measures, and liquidity loans from commercial and state-owned banks.

A number of e-services were developed to help the citizens during the pandemic, many of which were a result of collaborations between businesses and non-governmental organizations (NGOs). For instance, volunteers and private companies in Slovakia developed the contact-tracing app “Zostaň Zdravý” (“Stay Healthy”) and then handed it over to the government free of charge.<sup>132</sup> Similarly, the Lithuanian app “Act on Crisis” was created by a private group of individuals to help people affected by the pandemic access support.<sup>133</sup>

Exhibit 27

### Digital Challengers occupy the last ranks of the DESI index for digital public services

DESI Index – Digital public services (e-government), 2020  
Ranges from 0 to 100



Source: European Commission, 2020

## Case study Estonia

Long before the COVID-19 pandemic began, Estonia boasted one of the world's most advanced digital societies (Exhibit 28). Citizens could access online services such as electronic voting (i-Voting), online learning in schools, digital administration services (e-cabinet, digital ID, e-residency) and digital healthcare.<sup>134</sup> Since the beginning of the pandemic, the government has gone even further, working with a number of Estonian start-ups to add more online public services, including e-verification by notaries<sup>135</sup> and an automatic sick leave, temporarily allowing patients to open a sick leave in the patient portal themselves to ease the burden on doctors and nurses.<sup>136</sup> Another recent invention is Suve, a state-backed chatbot that helps Estonians and foreign residents find up-to-date information about COVID-19.<sup>137</sup> The chatbot was a result of a "Hack the Crisis" online event organized on the day Estonia declared a state of emergency. The solution took only ten days to develop and effectively took the load off busy emergency phone lines.<sup>138</sup>

Exhibit 28

### Estonia developed advanced digital services long before COVID-19, ensuring continuity of public sector services for citizens



#### Business and finance

**98%**

of companies established online

**99%**

Of banking transactions online

**98%**

of tax declarations filed online



#### e-government

**44%**

of Estonians use i-voting

**99%**

of public services online 24/7

**844**

years of working time saved



#### e-identity

**98%**

of Estonians have a digital ID

**92%**

use the Internet regularly

**900+m**

digital signatures



#### Mobility services

**1st**

country to legalize testing self-driven vehicles on public roads

**90%**

of paid parking is done digitally

**35%**

of accidents located remotely within 5 meters



#### Education and research

**1st**

in Europe in PISA test

**100%**

of schools use e-school solutions

**Every 10th**

student chooses to study IT



#### Healthcare

**99%**

of health data digitized

**99%**

of prescriptions are digital

**100%**

electronic billing in healthcare

Source: e-estonia.com



# 05

## Implications for policymakers, businesses, and individuals

Digital technology has profoundly changed the way we live and work. COVID-19 has accelerated the inevitable shift to online channels, creating more impetus for a far-reaching transformation of the economy and society in general. Technologies such as the cloud, the Internet of Things, artificial intelligence, 3D printing and blockchain are now gaining traction and will likely have a major impact on the public and private sector alike.

According to our research, in the past two years, CEE countries have not fully realized the growth potential of the digital economy as calculated in our previous report (see Chapter 1). However, the pandemic has added a sense of urgency. It has also changed

the way that the introduction of digital technologies is perceived—from a long-term strategy to an immediate next step. The need for flexibility and speed has also created more demand for modern ways of working, such as agile and remote work. Below, we present the implications of our analyses and suggest concrete actions that could be taken by policymakers, businesses and individuals in CEE in order to stay relevant and sustain growth in the next normal.

### **Implications for policymakers**

As discussed in Chapter 4, Digital Challengers currently come much lower in the digitization ranking than Digital Frontrunners and the Big 5. How can

policyholders in CEE speed up the countries' digital transformation? Four key levers can make a difference here:

— **Digital policies and legal**

**framework:** A successful national digital transformation means governments developing policies and regulations that can enable the secure development of digital technologies as well as the ability for users to access them in a safe manner. Examples of such regulations in this space cover data protection legislation (such as GDPR), cloud certification schemes, and laws governing remote work. Some of these regulations are at the EU level, such as GDPR. However, CEE governments may also consider local solutions such as "regulatory sandboxes" that enhance digital entrepreneurship.

In this context, the term "technology sovereignty" or "digital sovereignty" has emerged recently as an umbrella concept for digital policy making in Europe.<sup>139</sup> The term is often used to describe a wide set of measures—on artificial intelligence, quantum computing, competition, digital infrastructure, consumer protection, data or digital services—that seek to reduce the EU's dependence on foreign technology and digital services providers.

On the one hand, measures to boost European competitiveness could be considered: there is potential in improving the ability of the Single Market to help European companies innovate and be able to compete on

a global stage. On the other hand however, technology policies may impact how European businesses and consumers can access and benefit from value generated by innovative solutions such as IoT, big data, and AI.<sup>140</sup> Those implications may also be more prominent for smaller and export-dependent economies, such as the CEE countries, which cannot rely on their internal markets and thus require open access to the global one.

— **Digital infrastructure:** Connectivity is a crucial enabler for companies and governments, allowing them to digitize their services so that consumers can access them online. In fact, this has been the focus of CEE policymakers for some time now, and the results are visible—the region has high quality infrastructure. It managed to narrow the gap to Digital Frontrunners in terms of 4G and fiber optic coverage and even overcome the Big 5 in fiber optic coverage and ultrafast broadband subscription. An important next step in the connectivity journey will be to facilitate the development of 5G, which enables faster connection speeds (see Chapter 2).

— **Digital talent:** Investing in digital talent is crucial to ensuring the employability of the current and future workforce. The digital skills of children and young adults in CEE have improved at the basic level, but advanced skills lag far behind Digital Frontrunners. Furthermore, as we saw in Chapter 2, higher education attainment rates are lower

in CEE than elsewhere, and the number of STEM students has fallen between 2016 and 2018. Automation could also potentially cause 9.6 million people to become structurally unemployed by 2030, as discussed in Chapter 3.

Governments can counteract this trend by promoting different learning programs and education technology or edtech platforms that cover digital skills. Edtech combines the use of computer hardware, software, educational theory, and educational practice to facilitate learning. The promise of technology in the classroom is great: it enables personalized, blended learning delivering improvements in student outcomes;<sup>141</sup> it saves teachers' time;<sup>142</sup> and it equips students with the digital skills that they need for 21st-century careers.

— **Digital culture:** Digitization can become a top priority for governments, and should be communicated as such to businesses and citizens. Importantly, governments can reinforce trust in digital by ensuring robust cybersecurity and educating users about best practices. As smart digital solutions are easy to implement and scale across borders, governments can increase cooperation at a CEE level and even consider forming a separate cooperation platform, such as a "CEE Digital Council", the role of which would be to promote the sharing of knowledge and best practices.

## The digitization of public services brings benefits to all actors in the public sphere and as such should be treated as an imperative.



Using these four levers, policymakers can consider how to achieve a national digital transformation based on the following three pillars:

1. **Digital government:** Build a digital government with a clear vision, offering key public services to citizens and businesses via online channels in real time. This requires improved digital capabilities, scalable IT architecture and smooth data sharing between different public agencies.
2. **Digital ecosystem and innovation:** Create an environment where digital business models and entrepreneurship can flourish. This can be achieved by, on the one hand, increasing cooperation between CEE governments, and on the other, by supporting the digitization of established businesses and enabling early access to capital for start-ups.
3. **Digital inclusion and human development:** Increase the digital talent pool by promoting digital skills among children and

adults, improving labor market participation, enabling a bigger inflow of highly skilled migrants, providing e-solutions in healthcare and establishing better targeted welfare schemes.

In the following paragraphs we explore each of these pillars in detail, providing examples of best practices from different countries.

### Digital government

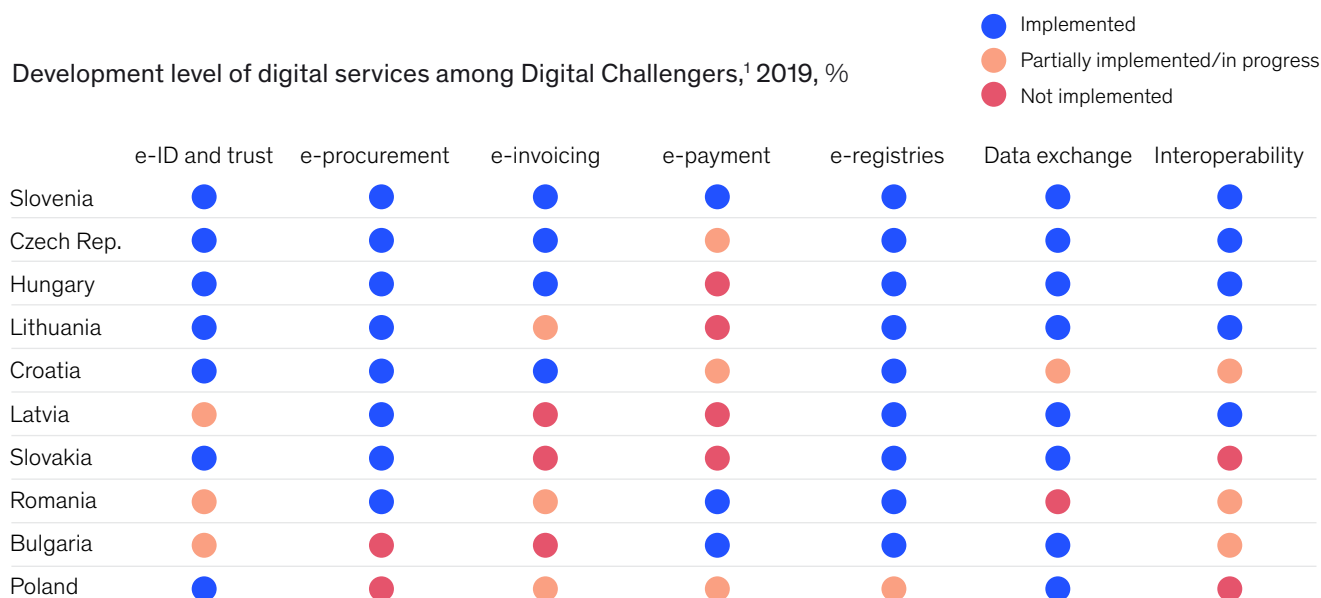
The digitization of public services brings benefits to all actors in the public sphere and as such should be treated as an imperative. The McKinsey Digital Sentiment Survey<sup>143</sup> found that at the peak of the pandemic there were almost 12 million new users of online services in CEE. Just 26 percent of these new users accessed digital services in the public sector and their satisfaction levels were lower than for other sectors. While the goal for governments during lockdown was to create new online services fast, we would now advise them to check the quality of those services and make sure that they are fully integrated with each other.

Digital public services bring a whole array of benefits. Perhaps the most tangible is that they offer 24/7 availability and remove the need for physical contact—a pivotal factor in the context of the pandemic. Digital interactions and automatic case handling consume less of citizens' time and reduce the administrative burden on businesses, while also freeing up public resources.<sup>144</sup> Moreover, improving public services can win the hearts of citizens: Statistics from several Western countries show that residents who are satisfied with public services are nine times more likely to trust the government overall.<sup>145</sup>

Looking at the CEE countries (Exhibit 29), it appears that practically all of them have either already implemented digital services or are in the process of doing so. Slovenia, the Czech Republic, and Hungary lead the way, with Bulgaria, Romania, and Poland bringing up the rear.<sup>146</sup> The three elements that CEE countries struggle with most are e-payments, e-invoices, and the interoperability of the data that they gather.

Exhibit 29

## Gaps remain in the implementation of digital public services in CEE



1. e-ID and trust – existence of trusted documents and authorization framework; e-procurement – platforms and environments digitizing government procurement activities; e-invoicing – solutions making it possible to accept and automatically process electronic invoices; e-payments – dedicated infrastructure for payments and other related services; e-registries – digitization of public information and knowledge sources; data exchange – platforms and solutions dedicated to data exchanges between government agencies; interoperability – the ability of systems to make use of information across different authorities/public bodies. Source: <https://joinup.ec.europa.eu/>, 2019

# 24/7

customer support is an important part of successful digital transformation of public services

However, many smart and validated digital public services exist in CEE. For example, the Hungarian government rolled out a multipurpose platform for local administration between 2017 and 2019, replacing legacy technologies. The services include a real estate cadaster system, a local tax system, a records management system, and a commercial register. Another example is the “trusted profile” in Poland. This is an e-signature system in which users can log on to services using their online bank account details, providing access to social security, tax information, and company registration procedures. The aim is to provide a digital one-stop shop for government services.<sup>147</sup>

Similar to other EU states, CEE countries are obliged to digitize their services as part of the “Single Gateway” initiative launched by the European Commission.<sup>148</sup> The key outputs of this initiative include providing information on different rules and rights that citizens and businesses have as part of the European Union single market. Through this project they will be able to access guidelines on how to carry out different administrative procedures, 21 of which will be fully available online by 2023. Furthermore, the “once-only principle” will be applied to enable cross-border exchange of data: citizens will be able to request that their data be shared with public authorities from other EU states. Finally, the quality of online services will be verified and improved on the basis of user feedback, regularly analyzed, and displayed on dashboards.

Simply moving public services online will not do the job. Accessing those services tends to be difficult: Citizens often have a hard time understanding the bureaucratic language, and navigating digital public services can be confusing as each government agency has a different website and approach. Digitization efforts have frequently consisted of nothing more than giving citizens online access to documents that they then have to print out and either send off by mail or submit in person. Moreover, different sites may require setting up separate accounts

and submitting the same information multiple times.

A truly successful digital transformation would make public services as easy to use as online shopping, where consumers can quickly find what they need, enjoy 24/7 customer support, and follow a small number of simple steps in order to achieve their objective. Yet, digitizing public services is a demanding task. The five commonest challenges are:

- The wide range of services that need to be digitized exceeds the capacities of a single actor
- Coordinating numerous actors, often with diverging interests and no one clear body in control
- Limited capabilities in the area of digitization and “agile”
- “No seat at the table” for service users during decisions about digitization
- The need to build broad support among civil servants, politicians, and the general public

A number of elements are required in order to overcome these challenges and make digital government a reality:

- **Clear ambitions for the digital transformation:** We encourage governments to approach the transformation through a program at a whole-of-government level, that is, across ministries instead of within silos, set measurable targets, and communicate their vision to different public institutions. Part of this task is making key decisions regarding the level of consolidation (all services available in one application versus many different digital channels), deciding whether digital services should be mandatory or optional, establishing metrics (such as user satisfaction, service penetration, or aspired level of automation and efficiency gains), finding ways to monitor these metrics, and using them to inform decisions.
- **Creation of digital labs:** The digital transformation of the public sector needs to be a centrally coordinated effort. To manage



the stakeholder complexity, one option is to create “digital labs” in which cross-functional teams focus on how to improve the various customer journeys. Digital adoption moves fast and requires a degree of flexibility that is difficult to achieve in a traditional government setting, where projects are typically implemented according to a “waterfall” model (in which each step depends on the results of the previous step). To reduce the risk of wasted resources and delayed implementation, an iterative approach, in which teams work in short cycles, use a “minimum viable product” method and frequently gather customer feedback could be considered.

- **Scalable IT architecture:** To create truly interoperable and scalable solutions leveraging cloud technologies, governments would ideally streamline their IT architecture and get rid of legacy technologies. Once a service model is chosen, the appropriate deployment model (public, private, hybrid, or community) can be determined.<sup>149</sup> For the sake of the users, as many applications as possible could be available via one consolidated channel, such as a website or a mobile app. This might be hard in the short term; as an intermediate step, governments can provide standardized guidelines, optimize web searches and unify the user experience across platforms. Lastly, investing in modularized IT architecture for recurring elements of service transactions, such as digital ID systems and payments can be considered. These service transactions are recurring elements of many public service transactions, which often have a similar structure. Developing these modular IT components centrally can accelerate digitization efforts and save costs.

#### **Digital ecosystem and innovation**

Besides developing their internal capabilities and digitizing public services, policymakers are responsible

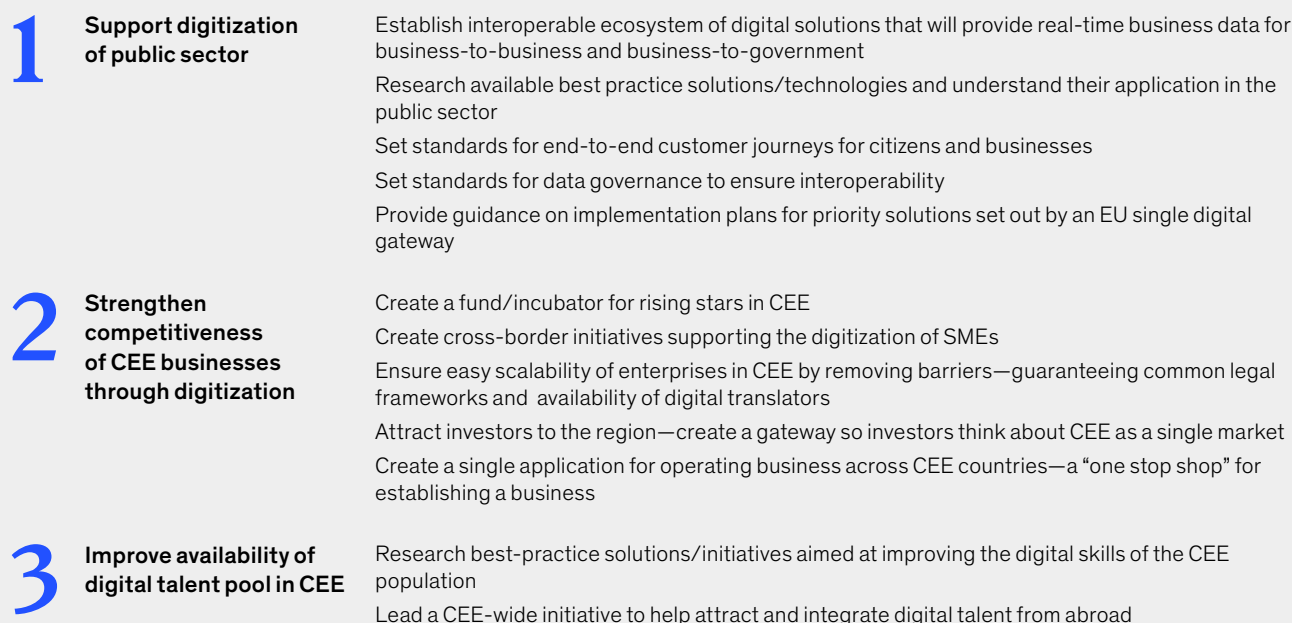
for creating a digital ecosystem in which individuals and businesses can thrive. Various levers can accelerate the development of the digital economy:

#### **CEE collaboration**

Digital Challenger countries, like the Digital Frontrunners, are generally relatively small: the average population of the countries in both groups is just 13 percent of the average for the Big 5, and the average GDP is 11 percent of that of the Big 5.<sup>150</sup> With the exception of Poland, most CEE states thus do not have large internal markets. This means that they have to rely heavily on trade. The Digital Challengers’ trade ratio to GDP is 134 percent,<sup>151</sup> while the Digital Frontrunners’ is 159 percent (131 percent excluding Luxembourg, on par with Digital Challengers).<sup>152</sup> The CEE region in its entirety is home to 100 million people and represents the 12th-largest global economy in terms of GDP.

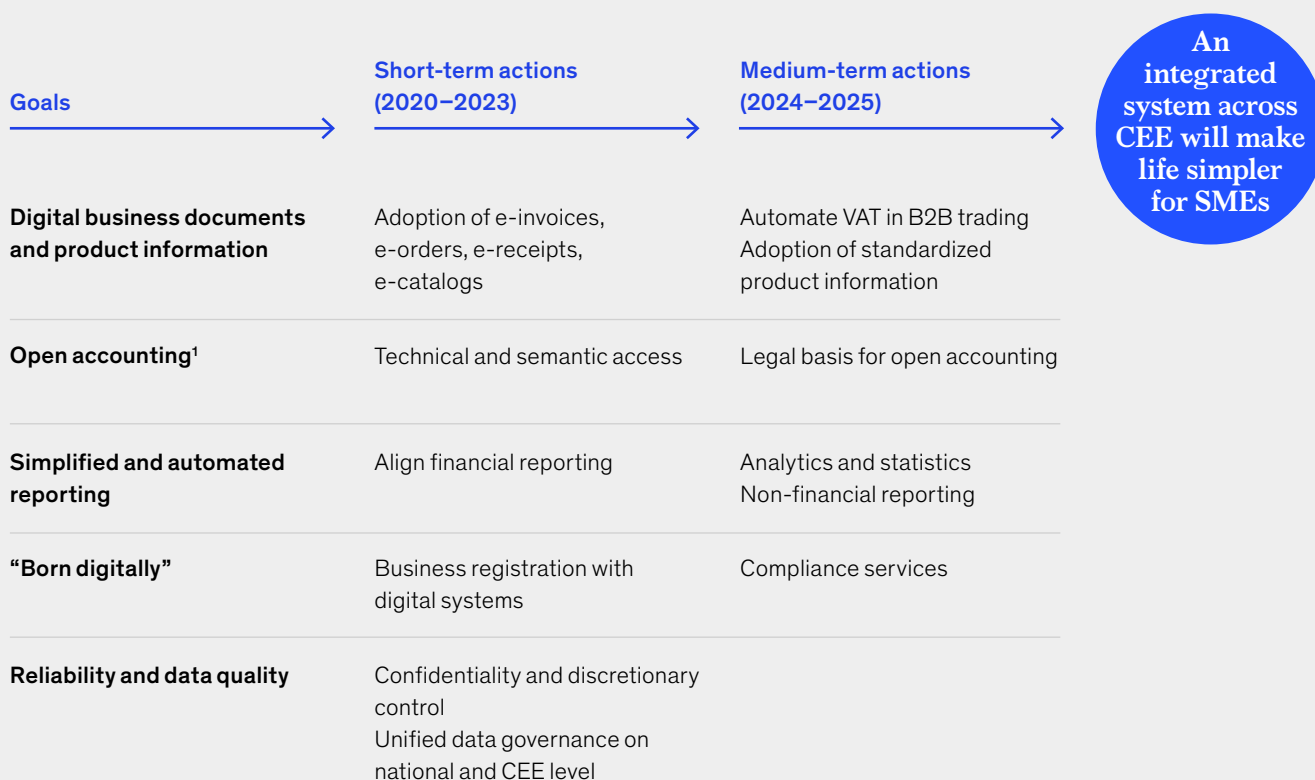
While some CEE collaboration initiatives already exist—the “Three Seas Initiatives” being the most notable example—none of them focuses exclusively on digitization; nor are there any collaborations that work toward unifying the CEE digital business environment or have working teams implementing such initiatives. Our suggestion would therefore be to create a new entity, a CEE Digital Council. Such a body could help share best practices and knowledge across the region, and set common standards for digitization. Northern Europe has already implemented a similar concept through the Nordic Council—an official body for inter-parliamentary cooperation established in 1952. Among the Council’s projects, there are digital initiatives, one of which is the Nordic Smart Government program, with three key objectives: to increase digitization in governments and society, to improve the competitiveness of the region through innovation, and to enhance the digital single market in the Nordic-Baltic region. If Digital Challengers follow this example, the key tasks and objectives of the CEE Digital Council might be as shown on Exhibits 30 and 31.

## The CEE Digital Council would help the region become an integrated digital market



## To increase the competitiveness of CEE companies, the CEE Digital Council could draw inspiration from the Nordic Smart Government

### Main focus of Nordic Smart Government, adjusted for CEE



1. Open accounting enables SMEs to share data from digital business documents with third parties of their choice through standardized content and interoperable APIs.

Source: nordicsmartgovernment.or; McKinsey analysis

The digitization program of the Nordic Council was agreed by means of a joint declaration in 2017, and followed up with other initiatives encompassing common strategies for AI, 5G, e-ID.<sup>153</sup> Similarly, CEE might consider setting up central, cross-functional teams with representatives from different countries, each contributing different skills in areas such as digital, IT, data science, business, and public policy. This could help establish common standards and coordinate the work of national agencies.

### **Fostering entrepreneurship**

Building support for start-ups, particularly those working with future technologies (such as the cloud, big data, AI, and blockchain) is another key area for policymakers. Digital Challengers could strengthen the entrepreneurial reputation of their major cities, as this would encourage entrepreneurs to stay in CEE and also attract more investors. Here, governments could build on examples such as Berlin, which has become a leading European start-up hub, second only to London.<sup>154</sup> This is due to a number of factors, including residential and commercial rents that have historically been relatively affordable. Berlin also has access to a diverse talent pool from other EU countries thanks to its geographical location: around 30 percent of its start-up workers come from abroad, according to the German Startup Monitor.<sup>155</sup> Three of Berlin's major universities offer entrepreneurship courses, and the German Federal Ministry for Economic Affairs and Energy (BMWi) has developed the EXIST start-up grants program to further support the entrepreneurial environment in higher education, providing grants, mentoring and free access to infrastructure among others.<sup>156</sup> Berlin has also emerged as a start-up hub thanks to its access to financing and support, with its ecosystem of venture capital funds, incubators, accelerators, and the Google-backed start-up campus Factory Berlin. For examples of CEE organizations supporting start-ups see Exhibit 32.

Funding is a vital ingredient in order for start-ups to grow. As mentioned in our previous report, policymakers could consider angel investing and provide additional incentives for investors by means of tax relief schemes, for example. The Enterprise Investment Scheme (EIS) and the Seed Enterprise Investment Scheme (SEIS) established by the UK government, for instance, help young, high-risk businesses raise funding by offering income tax reliefs and exemptions on reinvested capital gains.<sup>157</sup>

### **Improving competitiveness**

As mentioned in Chapter 2, several clusters are forming in technology in CEE: some are relatively well established, such as gaming, fintech and enterprise software (including cybersecurity and marketing), while others are still in their infancy, such as telemedicine and online education. Clusters such as these enhance competitiveness across national and regional borders. Encouraging their formation is an effective way for governments to support entrepreneurship and drive economic growth.

Clusters can simultaneously support competition and cooperation. In doing so, they—make the CEE technology ecosystem more competitive on the global stage and create new incentives for cooperation between companies in the region. According to a theory put forward by Michael Porter, clusters of independent, informally-linked tech players can enable benefits in efficiency, effectiveness and flexibility.<sup>158</sup> The Polish gaming and e-sports industry illustrates some of those benefits. In 2019, the industry was worth over US\$500 million, with game exports contributing to 96 percent of those revenues.<sup>159</sup> This was not just driven by the video game developer CD Projekt Red, we which mentioned earlier: there are over 400 other studios paying taxes and creating almost 10,000 jobs.<sup>160</sup> A strong gaming community has formed, with multiple video game festivals, associations, and competitions, attracting ever more

# \$500m

estimated value of the Polish gaming and e-sports industry in 2019

## Many organizations across CEE support start-ups, especially those working with future technologies



### StartupYard, Czech Republic

Central Europe's leading accelerator for technology start-ups, mostly geared toward "deep tech" start-ups that are solving challenging technology problems. It is the oldest accelerator of its kind in the CEE region and has so far supported over 72 companies from 16 countries.



### Startup Wise Guys, Estonia

One of the most active early-stage investors in the CEE region and Nordics. It has accelerated more than 145 start-ups in 15 cohorts, focusing on B2B SaaS, fintech, and cybersecurity.



### GovTech Lab, Lithuania

GovTech Lab Lithuania is an emerging innovation ecosystem in which entrepreneurs deliver technology products and services, often using new and emerging technologies, to public sector clients.



### Accelerator of MIT Enterprise Forum, Poland

This accelerator was created as part of the ScaleUP competition organized by PARP, which is the first project of the government's Start In Poland program. The paramount goal of MIT Enterprise Forum CEE is to support innovative science and tech start-ups from both Poland and CEE in the development of their business models, and introduce them to potential investors, business partners, and future clients in Poland, CEE, and the US.



people to the cluster. The public sector has taken notice of this, and now there are around 60 degree courses offered by Polish universities related to game development. The government has also created the GamelINN initiative, which awards developers with early stage grants, and the Polish Agency for Enterprise Development provides further financial support for product and brand promotion in foreign markets.<sup>161</sup> These developments have also attracted angel investors, private equity and global venture capital funds from China, Japan, and the United States.<sup>162</sup>

As this example shows, technology clusters can foster a public-private sector dialogue, addressing challenges such as talent acquisition and development, innovation, and global recognition, as well as capital access. They have a snowball effect that brings positive changes to society at large. CEE governments would be well advised to monitor the market closely, spotting any key areas of specialization and taking appropriate action.

Lithuania offers some good examples of what governments can do to support a growing cluster, in this case fintech:<sup>163</sup>

- **Industry associations:** Fintech hubs and associations in Lithuania are forging a close-knit community where insights and ideas are shared and developed. The country's fintech landscape also includes accelerators, incubators, several innovative "sandboxes" for product and business development, and over 20 coworking and flexible rental office spaces. With more initiatives in the pipeline, the fintech hub is set to attract even more global players and talented individuals.
- **Government adapts fast:** Short business establishment times and low corporate taxes are just a few of the benefits that characterize Lithuania's business-friendly environment.
- **A progressive regulator:** The Bank of Lithuania has been recognized as a highly progressive regulator.

It has streamlined the licensing process and automated a number of supervision procedures. It prioritizes progress and helps fintech newcomers enter the market transparently and smoothly. It is also creating an environment for innovation, where new fintech products can be developed and then scaled globally. This has been achieved by offering regulatory sandboxes for testing financial innovations in a supervised and regulated environment (such as the Fintech Sandbox, the Open Banking Sandbox, the Blockchain Sandbox). Other institutions have also followed the sandbox principle: the Energy Solutions Centre has launched the Energy Sandbox, commercial banks have launched the Open Banking Sandbox, and the Lithuanian Real Estate Development Association has launched the Proptech Sandbox.<sup>164</sup>

### Accelerating SME digitization

In Chapter 4, we saw that CEE companies still lag behind Digital Frontrunners in terms of adoption of digital tools. Within CEE, the gap between SMEs and large enterprises is between 11 and 29 percent. Policymakers could support the private sector in its digital transformation efforts, particularly within industries that are critical for the economy. It can do this by providing additional funding, for which several EU programs can be leveraged. But it can also organize targeted awareness-raising campaigns, run information events, and provide IT consulting services and training for SMEs in the area of digital skills and tools. Even more importantly, governments can make their procedures and interactions with business digital by default, obliging companies to embrace digital solutions. Some examples of government initiatives are given in Exhibit 33.

### Exhibit 33

## Examples of government actions helping businesses go digital



### Croatia

START enables citizens to start a business 24 hours a day, through a single electronic procedure instead of the existing seven manual steps.

All processes and procedures are connected through one electronic form, accessed by companies, banks, and relevant authorities.

START offers automated data entry. The system collects your personal data via your OIB (personal identification number) and automatically fills out the form. You only need to enter data unavailable through your OIB. All the e-forms are then automatically filled out.

Electronic documents created in the system communicate with all the necessary institutions. These documents are digitally signed and verified.

The business is launched in three to five days. Requests submitted electronically have priority over written physical requests.



### Poland

Biznes.gov.pl allows microenterprises to be established in a single day. Entrepreneurs can register the company and complete a tax profile on the platform or via their online banking platform.

Biznes.gov.pl is dedicated to people planning and conducting economic activities. Its aim is to help entrepreneurs successfully set up and run their business.

The platform serves a dual purpose: it allows users to access e-government services and it acts as a knowledge bank on entrepreneurship. It includes 1,100 service descriptions, 170 guides, and 300 online services (partially for non-national businesses).



### Lithuania

The “No Quarantine on the Internet” program helps Lithuanian SMEs be successful on the Internet. It has gathered more than 1,100 e-shops under a single domain.

The program helps businesses by providing consultations and business mentoring. It gathered 25 partners who help businesses develop e-commerce solutions.

The program organized 10 virtual training sessions presenting e-commerce marketing. Social media influencers and press were involved to encourage people to buy from e-shops and support SMEs in Lithuania.



Source: gov.hr, Croatian Bureau of Statistics; biznes.gov.pl; Enterprise Lithuania

## Digital inclusion and human development

Digital technologies can also be used to improve social inclusion and human development. Policymakers could look into improving the general public's digital skills, as this could increase participation in the labor market and contribute to the health and wealth of society.

### Improving digital skills

As mentioned in Chapters 2 and 3, promoting digital skills among their populations is one of the most important things governments can do going forward. In particular, this prepares young people for the demands of the future job market, and helps those already working to avoid becoming unemployed.

When it comes to youth education, ensuring standard digital infrastructure across educational institutions is key, as is supporting teachers in the transition period. Having access to digital tools and online resources has proven crucial during the pandemic, but it will remain important when schools return to normal operation. Technology offers new ways of learning and can help equip pupils with the knowledge, skills, and mindsets they need to help them thrive in an age of rapid digital change.

The adoption of technology in educational institutions requires mainly curriculum development, the availability of the necessary infrastructure and learning platforms, and improving the digital skills of educators by including this in their teacher training. For example, it can be helpful to create incentives for private-sector companies to develop edtech platforms.

Digitization also radically changes job profiles and requires a proactive approach to reskilling the workforce. The skilling ecosystem consists of various players and policymakers. Public-sector institutions play a key role here. Potential actions include promoting mid-career training, providing training for people changing jobs or registered as unemployed, and supporting citizens in their lifelong learning.

Digital Challengers could look to Denmark for inspiration on how to implement a successful lifelong-learning strategy. The Danish Lifelong Learning Strategy was developed as early as 2006.<sup>165</sup> The strategy targets all levels of the education system, from preschool to adult and continuing education. For lifelong learning and adults in particular, Denmark offers consultations in centers around the country, guidance by telephone, text message, email, chat or Facebook for all citizens, and dedicated research centers for lifelong learning, including monitoring and evaluation services. Courses are widely available and cover a variety of levels to allow for progression from basic to more advanced. In 2015, Denmark also strengthened its focus on the integration of low-skilled workers through subsidies to employers for improving employees' skills and an adult apprenticeship scheme offering subsidized salary payments during training. Denmark's strategy has proven effective: The country was ranked second in the IMD World Talent Ranking in 2019.<sup>166</sup>

### Improving participation in the labor market

One way of expanding the labor market is to promote remote work models and adjust regulations to enable greater inclusion of women, young people, and individuals living in rural and economically disadvantaged areas. While female participation in the labor force has been steadily increasing over the last couple of years in CEE, from 62 percent in 2014 to 69 percent in 2019, but there is still a gap to Digital Frontrunners.<sup>167</sup>

People living in rural areas are limited as to the types of jobs that they can find. Many rural areas offer very few employment opportunities, forcing professionals either to travel long distances or to be removed from the workforce completely. Telecommuting and other types of flexible work enable professionals to gain employment regardless of their location, opening up a wealth of job opportunities otherwise not available to them. In the majority of CEE

countries, existing legislation limits the options for teleworking, as companies must implement special contracts and policies. During the COVID-19 pandemic, governments have had to temporarily amend these laws, and some are already working toward introducing more flexible permanent solutions.

### Improving access to healthcare

Each year, poor health takes a heavy societal and economic toll. The COVID-19 pandemic is an unwelcome reminder of just how much health matters for individuals, society, and the global economy. Better health promotes economic growth by expanding the labor force and boosting productivity, while also delivering immense social benefits.<sup>168</sup> Leveraging digital solutions in healthcare can make quality healthcare more affordable in hard-to-reach areas, improve doctor-patient coordination and increase efficiency. Technological tools and solutions are used to enhance the patient experience, service delivery, create new business models, and make communication more efficient.

One of the key elements needed in order to fully benefit from digitization in healthcare is a system of digital medical records that electronically stores information about patients from hospitals, outpatient care providers, general practitioners, and other healthcare practitioners. An example of such a solution is EESZT in Hungary,<sup>169</sup> an electronic health record system that can be easily accessed by any medical practitioner or hospital as necessary. Similarly, Estonia introduced its e-Health Record system back in 2008, which not only integrates data from different healthcare institutions but allows patients to view all their medical records (including visits, prescriptions, and test results) in one place, in a standardized format.<sup>170</sup>

Unifying electronic health records allows for faster, smoother processes between providers, by reducing the time needed for administration. The value lying in the subsequent productivity and efficiency gains can be significant, given the amount of time currently spent on



administrative tasks by CEE healthcare professionals. For example in the Czech Republic, general practitioners spend 40 to 50 percent of their time on administrative tasks.<sup>171</sup> This means that doctors and nurses have significantly less time for interacting with patients. However, for patients to fully accept electronic health records, they should be able to maintain control over their data and be able to decide which doctors and hospitals are given access.

Another source to unlock the economic benefits through improved healthcare is telemedicine. It offers a wide range of benefits, including enabling better access to care for people living in rural areas, as well as the elderly and people with disabilities, and increasing the use of preventive care, which, in effect, can improve long-term health. Telehealth services are among the biggest e-health trends in Europe, positioned second in the recent Annual European eHealth Survey,<sup>172</sup> just after patient health records, mentioned above.

Telehealth is therefore not a new trend, though COVID-19 has caused a massive acceleration in its use. During the pandemic, telemedicine helped expand access to care at a time when patients' had limited ability to see their doctors. Sweden's KRY International, one of Europe's biggest telehealth providers, reported that registrations were up more than 200 percent. France has changed regulations to ease access to telemedicine. With uncertainty around a vaccine or treatment availability, patients and healthcare providers both have reason to expand virtual interactions.<sup>173</sup>

Actions taken by healthcare leaders today will determine if the full potential of telehealth is realized after the crisis has passed. Ensuring successful implementation of legislative frameworks, accessibility of funding, definition of interoperability standards and support in upskilling to provide the necessary talent will not only help to provide high-quality healthcare and reduce inequalities, but also support the development of the emerging healthtech cluster mentioned in Chapter 2.

## Implications for businesses

During the pandemic, the way people interact, work, travel, spend their leisure time, use public services, and perform other routine activities has shifted dramatically. These shifts have led to an unprecedented acceleration in the adoption of digital technologies in virtually every sector. As the McKinsey COVID-19 Digital Sentiment Insights survey shows, 12 million new users of online services appeared in CEE during the first peak of the pandemic this spring. What is more, 70 percent of respondents say that they will continue to use new services digitally after the pandemic.

In the following paragraphs we examine three pillars of digitally-led growth, focusing on solutions that go beyond the end of the pandemic. As in our discussion of the implications for policymakers, these cover three key areas: accelerating digital adoption, rethinking the organization, and investing in digital talent.

### Accelerating digital adoption

Restrictions introduced during the pandemic are a catalyst for digital transformation. Not because they have significantly changed the solution, but because they have made the solution all the more important. Having an e-commerce website, online customer service and cloud and automation technologies (including data analytics, AI, RPA, and improved IT architecture) has become much more important and has to be implemented faster. It has become a sign of business resilience: companies that were digitally advanced dealt better with the crisis. But the ingredients for a successful digital transformation have not changed completely. For that reason many of the recommendations that we put forward two years ago in our previous report remain valid today. To accelerate digital adoption, companies and decision makers should focus on three areas: digitizing customer interactions, optimizing operations and modernizing IT architecture.

### Digitize customer interactions

COVID-19 has shifted consumer habits and behaviors to digital channels, and

# 70%

of respondents say that they will continue to use new services digitally after the pandemic

companies would be well advised to follow suit. To meet new customer needs and prioritize new solutions, businesses should first understand what exactly the new expectations are. They can do this by engaging in dialogue with clients by means of focus groups and surveys. Given that the situation with regard to the pandemic changes by the week, they will also need to use real-time data analysis and AI in order to decode which of these trends are here to stay. It is not enough to simply transfer products from physical stores to e-commerce shops: in some instances products and services need to be adjusted, product portfolios reprioritized, solutions bundled, and new, innovative products created.

One of the key trends that has emerged during the pandemic is a greater emphasis on health and safety.<sup>174</sup> The need for social distancing and constant sanitation meant that companies had to adjust the way they interacted with clients, minimizing physical contact. Of course, one customers have grown accustomed to this contactless world they may not want to go back to the old ways. For instance, grocery retailers have had to invest in self-service checkouts, and shoppers may not want to go back to waiting in line at a checkout counter, even after health concerns fade away. Similarly, if customers of banks or telecommunications firms have a positive experience using a call center or a chatbot to resolve their issues during the pandemic, they may be reluctant to visit physical branches in the future. In Poland, prior to the pandemic, Orange introduced a product called Flex, a fully digital operator with no physical stores and no call center. Customers use an app for everything from onboarding to service, roaming, and package changes. Introducing the product before the pandemic paid off: sales of Flex grew by more than 80 percent in April 2020 alone.<sup>175</sup>

The changes are also forcing companies to optimize their physical channels. In banking, between 10 and 25 percent of customers in Western Europe intend to visit branches less frequently now, since the beginning of the pandemic;

however, 30 to 50 percent still prefer face-to-face assistance when dealing with more complex issues.<sup>176</sup> This will limit the need for cash availability at counters and will require changes in the mix of branch staff and more flexible job configurations.<sup>177</sup>

Some banks in the CEE region are already piloting new, agile branch operating models, prioritizing digital education of customers (encouraging them to move simple operations, including cash withdrawals, to self-service channels) and introducing cross-skilled advisers who are focused on complex sales or advice only.

Things are also changing in telecommunications. In Croatia, for example, telecommunications company A1 Hrvatska partners with Glovo, a delivery company, to enable online ordering and delivery of its services and products. Covering seven cities in Croatia, the partnership enables online sales and improves speed of delivery. Products such as routers and SIM cards can be delivered to users within 45 minutes.<sup>178</sup>

#### **Use new data to optimize operations**

Digital technologies play a major role in the optimization of back-office functions, including supply chain and operations—the backbone of every company. This is also an area that COVID-19 has had a significant impact on, disrupting logistics, causing shortages in materials supply, and creating rapid changes in demand patterns.<sup>179</sup>

Companies need to incorporate real-time data into their decision making. This involves rapidly validating models, creating new data sets and enhancing modeling techniques. In return, they can expect better demand forecasting, asset management, and ability to cope with volume changes.<sup>180</sup> Many companies invested in such solutions early on, and have improved further during the crisis.<sup>181</sup>

One solution that has been around for some time and will continue to be relevant in the future is robotic performance automation (RPA). RPA technologies are already widely used

# 10–25%

of customers in Western Europe intend to visit branches less frequently since the beginning of the pandemic

to automate repetitive tasks in support functions, reducing costs and improving accuracy.<sup>182</sup> More recently, they have entered operations centers, where automation can cut costs by between 30 and 60 percent, while increasing delivery quality.<sup>183</sup> RPA technologies can be implemented for tasks such as network monitoring, automated dispatching, and incident tracking.

Global software company UiPath, which was founded in Romania, enumerates various use cases for RPA during COVID-19, such as exchange of information on COVID-19 and its spread, processing government loans to small businesses, and managing cancellation or purchase orders from consumers.<sup>184</sup> One airline, for example, used RPA to process voucher requests by ticket holders whose flights were canceled due to COVID-19. The airline created six automated systems and deployed three bots within 24 hours to handle the high volume of requests, cancellations and re-bookings. In this way they saved more than 10,000 hours of back-office work in the first 14 days after implementation and ensured a positive customer experience.<sup>185</sup>

A McKinsey survey of 60 senior supply-chain executives in the second quarter of 2020 highlighted key concerns and plans for increasing resilience in the long term. Interestingly, the problem mentioned most often was “insufficient digital technologies in the supply chain” (85 percent).<sup>186</sup> Additionally, 75 percent of respondents faced issues with production and distribution, and 73 percent had encountered problems in their supplier base.

In terms of plans for the future, respondents admitted the urgency of improving their supply-chain technology, but also emphasized that they needed a skilled workforce in order to apply new solutions at speed and scale. Around 90 percent of leaders said that they intended to invest in digital supply-chain talent through a combination of upskilling and reskilling their current employees and new hires.<sup>187</sup> Also, about a half of them expected permanent changes

in planning processes, including greater centralization of planning activities, shorter planning cycles and introducing advanced analytics.<sup>188</sup>

### **Modernize IT**

As outlined in the McKinsey article “From surviving to thriving: Reimagining the post-COVID-19 return,” companies will also need to look into improving their IT productivity in order to lower their cost baseline, and investing in the development of new digital solutions.<sup>189</sup> This means quickly reducing IT costs and making them variable wherever possible, to match demand. In other words, businesses need to determine which costs are flexible in the near-to-medium term, for example, by evaluating non-essential costs related to projects or maintenance and reallocating resources. After this, they should clearly define their future IT product platform, together with the skills and roles required to sustain it. These skills must be mapped onto the new organizational model, and leaders who can train people to fill the new or adapted roles need to be identified. Lastly, they need to speed up the adoption of cloud and automation technologies, including bringing cloud operations on-site and decommissioning legacy infrastructure.

During COVID-19, some companies have invested in cloud solutions to improve their resilience. For example, LPP—a Polish retailer—decided to move its full e-commerce infrastructure to the cloud by the end of 2020.<sup>190</sup> UPC also recently implemented a platform to shorten the time to market of new solutions and applications.<sup>191</sup>

### **Rethinking the organization**

In the face of the pandemic, businesses had to adapt their ways of working. To function in the new virtual setup, many changes were needed, from the basic question of where and how employees worked to how they interacted with customers. Decisions needed to be made and implemented fast. Some companies turned to agile practices in the hope of moving more quickly, gaining greater transparency over tasks and shifting resources more freely in line

with changing business priorities.<sup>192</sup> In the following paragraphs we discuss the agile operating model and see whether those companies that implemented it before COVID-19 were indeed faster and more resilient after the pandemic began. We also explore the topic of remote work and how it can drive organizational change in the long term.

### **Flexible operating model**

Production line systems, still present in today's workplaces, were driven by the imperative of industrialization, where standardization and stability were important. In today's ever-changing digital world, flexibility and adaptability are the key markers of success.

Yet, some organizations are struggling to adjust to the new reality. They are falling victim to three kinds of “structural waste”. First, there are too many handovers between departments, which slows down time to market. Second, teams have difficulty keeping up with demand and often spend their time working on topics of little relevance to customers. This leads to poor resource allocation. Lastly, multiple managerial levels and steep hierarchies within companies suffocate individual creativity and kill motivation.

Organizations are typically structured into silos, which each has its own objectives and interests. This leads to miscommunication and poor collaboration. Furthermore, companies have long, bureaucratic processes for introducing new products, with countless documents, approvals and people involved. A waterfall approach is used, meaning that customers only see the product at the very end of the process. By then, customer expectations have probably changed—and resources have been wasted. To move away from this Industrial Age model, it's not enough for companies to change their structure. They also need to significantly transform areas such as processes and technology. And their people have to follow suit in order for the changes to be lasting.

After a successful agile transformation, companies break down most of their large projects and replace them with

objectives and key results—OKRs—as well as an outcome-driven mindset. These are aligned with the company's strategy and owned by agile teams. Agile teams deliver tasks in biweekly sprints, focusing on products and continuously testing out ideas with clients. Key initiatives are reviewed and planned in quarterly cycles. This allows companies to drop low value-adding activities and shift resources elsewhere.

In a certain sense, the recent COVID-19 crisis has been a litmus test for organizations and their ability to quickly adapt to unexpected circumstances. To find out exactly what was going on, McKinsey & Company partnered with Harvard Business School to ask executives and leaders in agile companies across seven different sectors if being agile had helped them react to the crisis better. The results? A significant majority think that their company benefited from agility in terms of both customer and employee satisfaction and operating performance (Exhibit 34).<sup>193</sup> Furthermore, we performed a series of analyses to see whether the positive survey results are reflected in publicly available data. When looking at European telecommunications

companies that launched services in response to COVID-19, we saw that firms that were highly mature in terms of agile practices responded on average twice as fast as those that had not yet implemented any agile practices. The same result was found for banking: launching an online service took agile banks ten days on average—about two times as fast as their non-agile peers.<sup>194</sup>

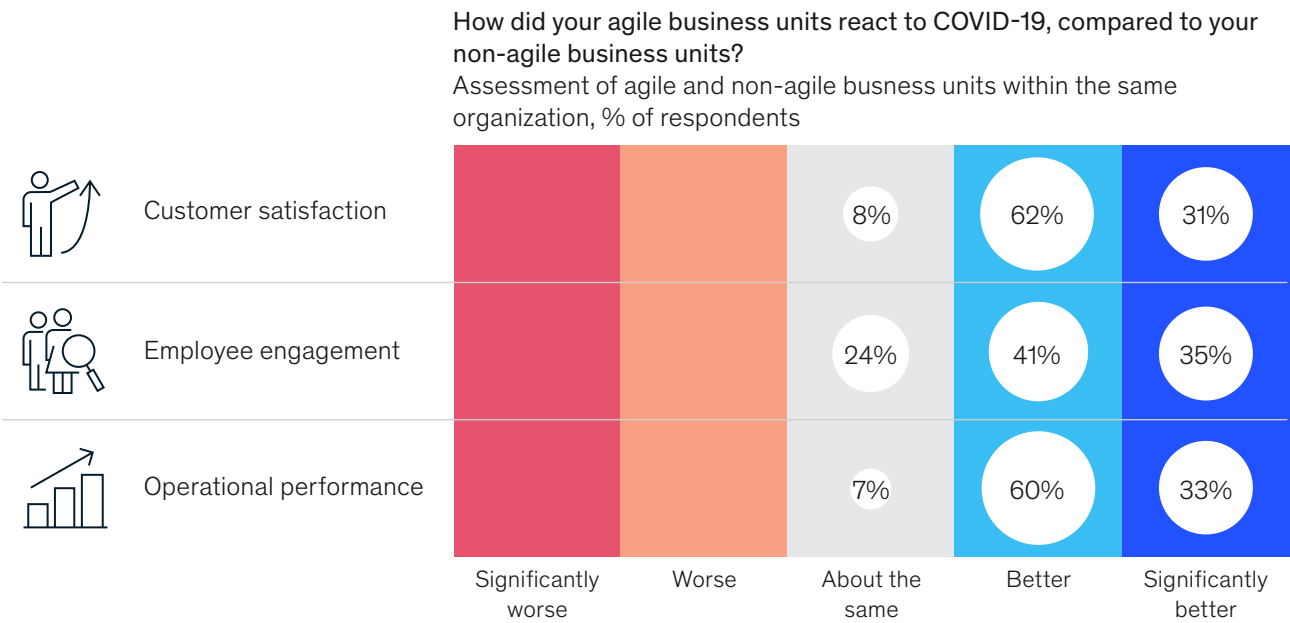
In terms of the adoption of agile practices, CEE is fairly advanced compared to its Western peers. This is mostly because of the relatively small market size in individual countries, which allows for more experimentation. Telecommunication and banking lead the way in the region, with increasing interest from other industries, including oil and gas, insurance, retail, and even the public sector. Moreover, while previously agility was reserved for functions dealing with product development, we now see an increased appetite for applying agile concepts in other areas, such as support functions, sales, and customer service. Together with the digital acceleration caused by COVID-19, these trends may make more companies consider rethinking their operating model.

Remote work

The concept of remote work is not new. However, in the past it was limited to visionary tech companies and start-ups that wanted to attract young talent, and freelancers who traded office life for more diverse work opportunities. As discussed in Chapter 3, remote work was not popular in CEE: only nine percent of employees worked from home in 2019.<sup>195</sup> Companies shied away from putting remote work to the test because of the large fixed costs associated with providing the necessary equipment, unfavorable employment laws, and limited options for monitoring workers' performance.

The pandemic changed the rules of the game. Now, around 30 percent of the workforce in the Digital Challengers is remote.<sup>196</sup> Social distancing rules will continue to limit the extent to which office space is used. According to *The Economist*, the average office can function with 25–60 percent of its staff while maintaining a two-meter distance between employees.<sup>197</sup> A survey conducted by Morgan Stanley shows that only 50 percent of people in the Big 5 countries now work in the office every day, and one-quarter work

Exhibit 34  
**Business units that were already agile responded better to the COVID-19 crisis than those working in the traditional way**



Source: McKinsey COVID-19 research on agile organizations, n = 25 organizations

from home full-time.<sup>198</sup> Another survey by Gartner further indicates that around 74 percent of CFOs plan to limit office space, keeping part of their workforce remote on a permanent basis after the pandemic.<sup>199</sup> Employees also have an appetite for continuing to work remotely, albeit with occasional access to the office.<sup>200</sup>

Going forward, companies will have to decide what model works best for them. This will not be easy. They will need to perform a thorough cost-benefit analysis, taking into account many different factors, such as access to talent, productivity, and real-estate costs. The analysis should also be adjusted for different occupations and their particular requirements.

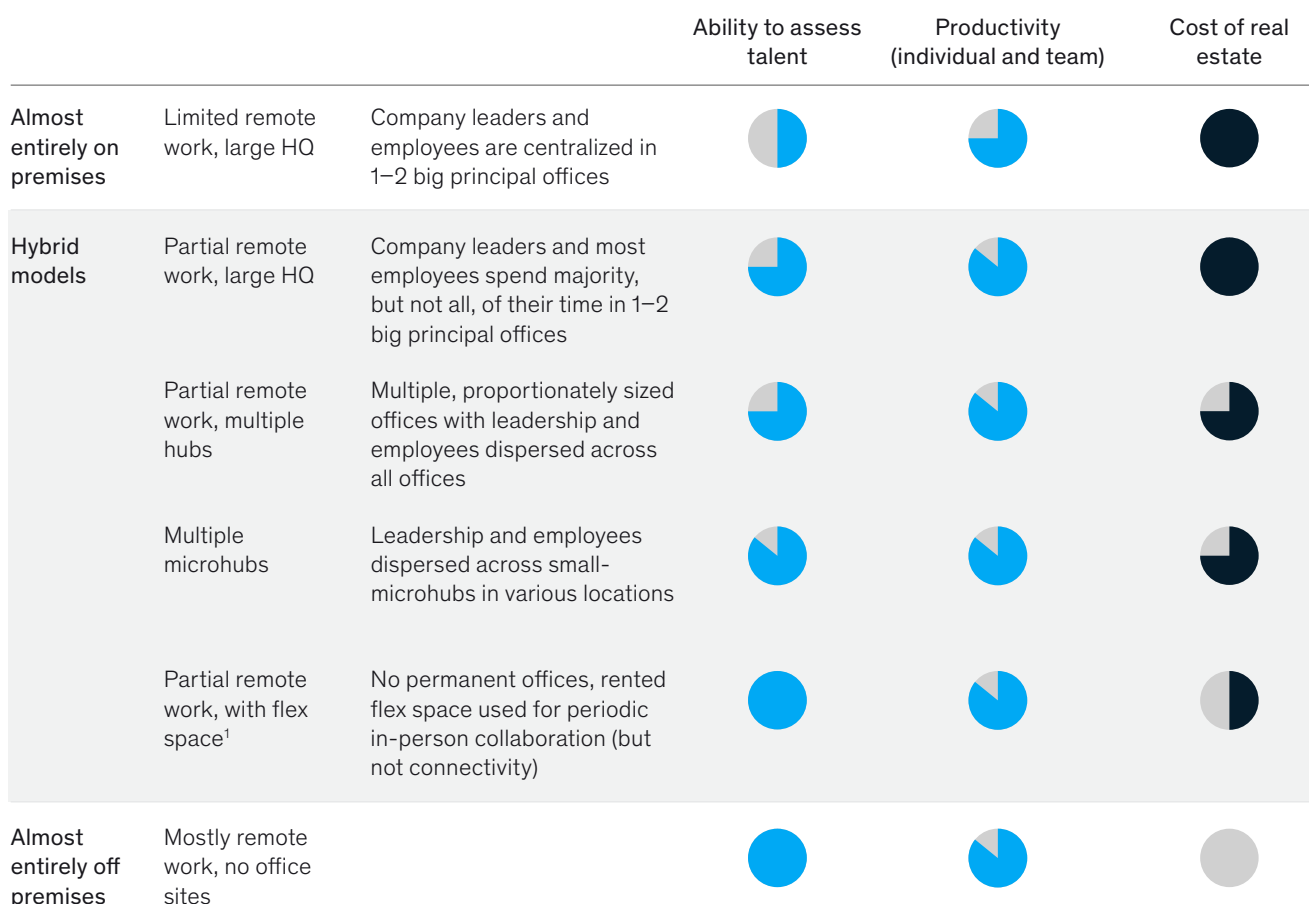
While all advice should be tailored to the specific company and industry, some general recommendations are possible. Thus, we believe that hybrid work should be the dominant model: only a few industries can implement one of the two extremes—100 percent office presence or 100 percent remote. A fully remote model would be possible, for example, for outsourced call centers, customer service, telesales, publishing, PR, marketing, research and information services, IT, and software development. The advantages of this model include better access to talent and a drastic reduction in real-estate costs. However, it limits the chances to build and maintain relationships and risks increasing employees' sense of isolation (Exhibit 35).

Exhibit 35

## Optimizing the hybrid virtual continuum

Six models reflecting a mix of on-site and remote working

■ Desirable outcome  
■ Cost to be managed



1. Flex space includes temporarily (eg, monthly rented space used in selected cities for periodic meetings and collaboration).

Source: McKinsey Quarterly, "Reimagining the post-pandemic workforce", July 7, 2020

For a hybrid model to be successful, companies need to create a culture where employees working remotely are treated exactly the same as those working on-site. To maintain productivity levels, managers will need to ensure that performance metrics are transparent, which means clearly defining team goals and setting measurable outcomes that are visible to a wide audience, such as the entire department or organization. Working remotely, fully or partially, limits the possibility of having informal chats by the coffee machine or water cooler. Accordingly, firms may want to consider organizing company events and trips to foster a sense of belonging and connection to the organization and its people.

### Investing in digital talent

We turn to this pillar last—not because it has the lowest priority but because it builds on the previous two pillars. As the adoption of AI and automation has sped up and new ways of working

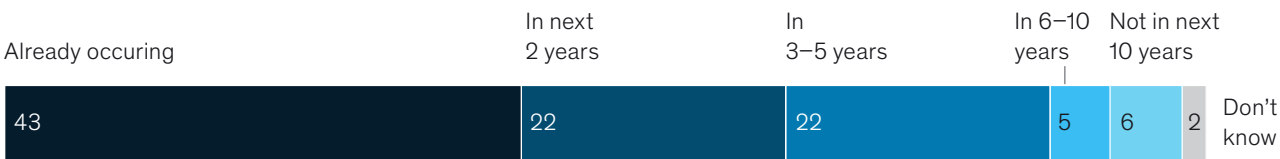
emerge, many organizations have already made reskilling a priority. The crisis has accelerated this trend, with businesses quick to embrace remote working. Thus, it is more important than ever before for companies to undertake reskilling at scale.

Recent McKinsey Global Survey on future workforce needs showed that although 87 percent of executives are experiencing skill gaps in the workforce,<sup>201</sup> or expect to in the next few years, only 28 percent report that their organizations are making effective decisions to close that gap<sup>202</sup> (Exhibit 36).

Clearly, companies need to update their talent strategy by identifying the types of skills needed and then mapping current employees' skills against their future needs. This will pinpoint the gaps and form a basis for either updating plans for upskilling and reskilling or creating new profiles for recruiting efforts.

Exhibit 36  
**Respondents expect to see skill gaps as market and technology trends alter organizations' talent needs**

When skill gaps are expected to occur within organizations,  
 % of repondents<sup>1</sup>



Share of organizations' current roles at risk of being disrupted by market or technology trends in next 5 years  
 % of repondents<sup>1</sup>



1. Figures may not sum to 100% due to rounding, n = 1,216.  
 Source: McKinsey Global Survey "Beyond hiring: How companies are reskilling to address talent gaps"; Survey conducted May 2019 and published February 2020.



Besides digital competence, other workplace skills are also becoming crucial. According to McKinsey Global Institute,<sup>203</sup> people will in the future be spending more and more time using their technological skills at work, but right behind this come soft skills, such as social, emotional, and higher cognitive skills (Exhibit 37). HR professionals in different industries say that they have difficulty recruiting people with problem-solving and communication skills (Exhibit 38).

Effective reskilling in these soft skills requires blended learning journeys that mix traditional learning, such as training and digital courses, with less traditional methods, such as peer coaching.

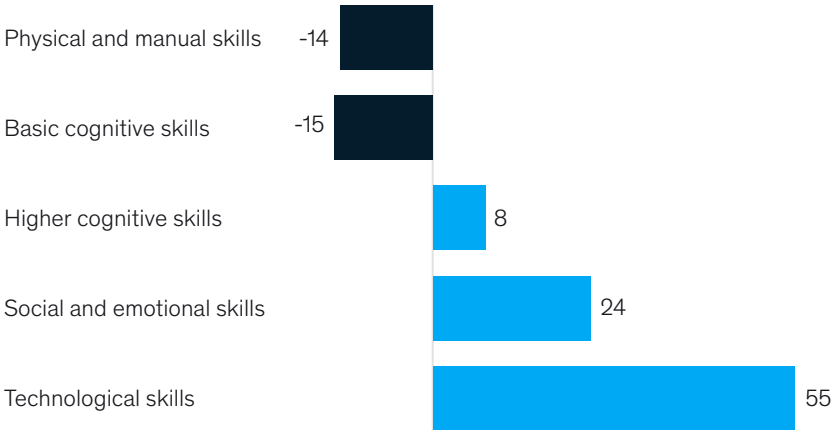
**Upskilling current employees**

Hiring and retaining top talent—the scarcest capital of all—means creating a unique workplace experience and committing to a renewed emphasis on talent development. Talent managers need to think of the wider context

of career paths. These should then be clearly linked with performance evaluation to give employees more clarity and motivation to excel at their jobs. In addition, a new McKinsey Global Survey shows that organizations with effective talent management programs have a better chance of outperforming their competitors.<sup>204</sup> To help managers navigate this complicated landscape, digital HR tools are required, either developed internally or acquired.

Exhibit 37  
**Technological and social/emotional skills will gain in importance**

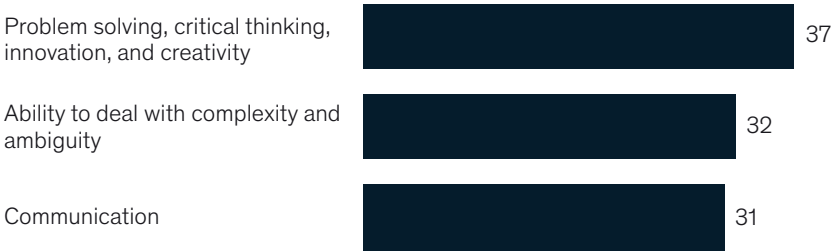
Percentage change in total hours worked, 2018 vs 2030  
(Europe and US, estimates)



Source: “Five Fifty: Soft Skills for a hard world,” *McKinsey Quarterly*, McKinsey.com

Exhibit 38  
**HR professionals report difficulty recruiting candidates who have the necessary soft skills**

Top three areas of soft skills missing  
% of respondents



Source: “Five Fifty: Soft Skills for a hard world,” *McKinsey Quarterly*, McKinsey.com

The importance of training goes beyond career development or reskilling initiatives, of course. Employees need help adjusting to remote working environments, where human contact is reduced to a videoconference. They may need guidance on how to effectively communicate with their colleagues, or how to separate their work from their personal lives while remaining productive. Many organizations are offering remote training to address challenges such as effective leadership of remote teams (a new skillset for most managers) and building personal resilience in difficult circumstances.<sup>205</sup>

Another important issue is cybersecurity. With their company laptops, employees take home vast amounts of data, some of which is confidential and sensitive. Moreover,

some employees use their own devices to work remotely, which may lack up-to-date security software, further increasing the possibility of data breaches. To counteract this, companies should consider making cybersecurity training obligatory for all employees and ensuring that appropriate software is used. This may mean that more cybersecurity experts will need to be recruited.

#### Recruiting new talent

The pandemic has caused many companies to rethink their hiring processes. Following on from successful experiments in remote hiring, some HR departments are reconsidering the need for in-person interviews at all. CHROs have an expanding range of tools at their disposal, including assessment platforms, to help them find talent.

Several such platforms leverage new technologies to achieve a deeper understanding of people's skill sets and match them more accurately with available jobs.<sup>206</sup>

## Individuals

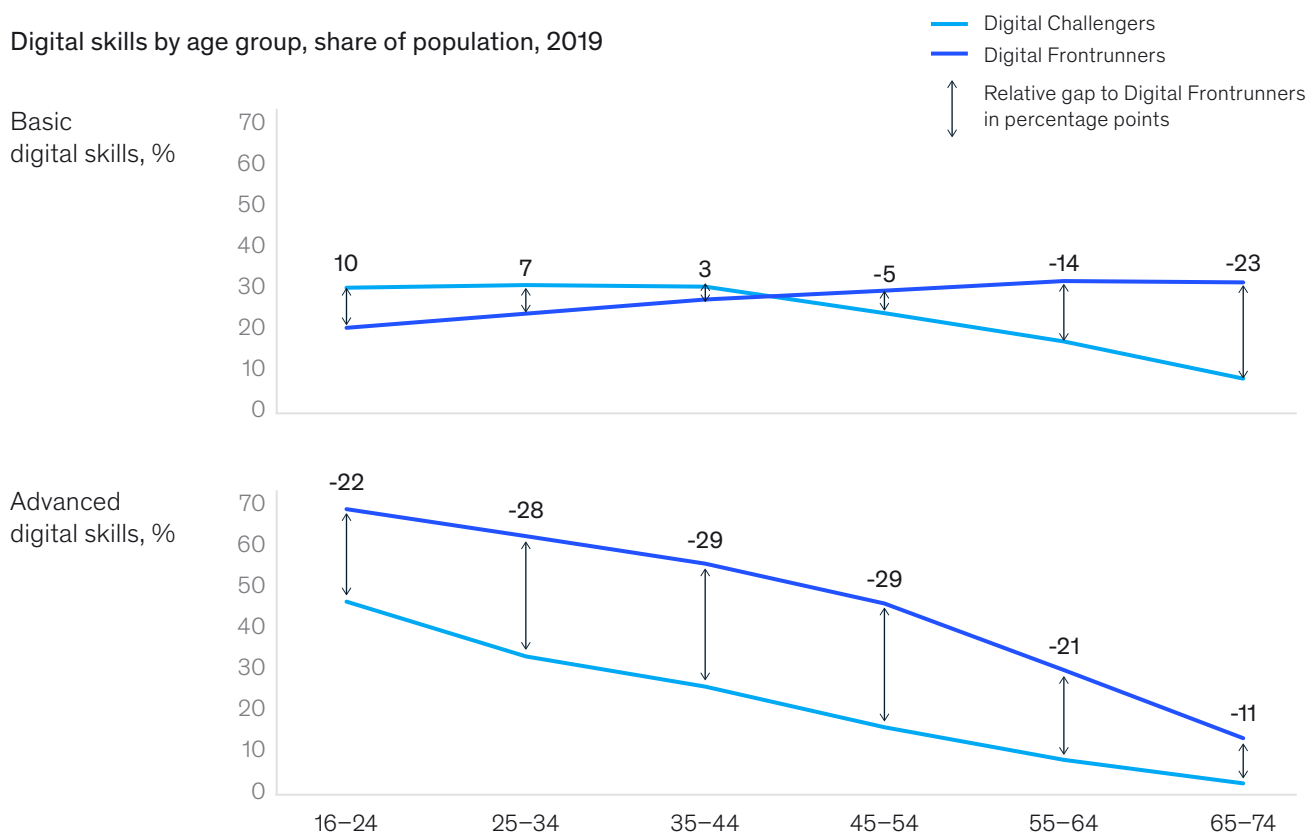
### Focus on lifelong learning

Digitization is affecting various areas of our lives. As we saw in Chapter 4, COVID-19 has increased people's engagement with digital services and led to a significant rise in digital adoption in the 65-and-over age group. As work shifted into remote mode—often from one day to the next—individuals' digital competences gained vital importance. Not only that, people with strong technological skills now find that they can access professional opportunities with companies located a long way away. Geographical boundaries are no longer a barrier.

Exhibit 39

### Digital Challengers outperform Digital Frontrunners only on the basic digital skills in the 16–44 age category

Digital skills by age group, share of population, 2019



Source: Eurostat 2019; McKinsey analysis

Gaps still exist between Digital Challengers and Digital Frontrunners when it comes to individuals' digital skills (see Exhibit 39). In terms of basic digital skills,<sup>207</sup> the CEE population aged under 45 actually outperforms their peers in Digital Frontrunners, young people aged 16–24 as much as ten percent ahead. However, the gap for the population aged 65–74 is as much as 23 percent. In terms of advanced skills, the gap between Digital Challengers and Digital Frontrunners is significant across all age groups: For 25–54 year olds, it is almost 30 percent<sup>208</sup> (Exhibit 39).

As the labor market changes, individuals will need to invest in lifelong learning. Learning methods are also evolving. Advances in AI enable more tailor-made training, with the most advanced training methods offering teaching adjusted in real time based on the individual's interests, needs, and progress.<sup>209</sup>

Besides online self-study platforms, many companies, organizations and governments run programs that support the acquisition of technical knowledge. A good example is Women GO Tech,<sup>210</sup> a project organized by the Lithuanian ICT sector association INFOBALT and Global Shapers Vilnius, an initiative of the World Economic Forum. The project was launched in 2016 with the aim of helping 500 women find jobs, achieve promotion, or establish a start-up. It comprises a voluntary mentorship program where industry experts share their knowledge, offer advice and provide guidance on career choices through one-on-one mentoring, sessions on specific topics, seminars and visits to tech companies, and large events providing additional opportunities for education. Mentors cover ten IT specializations, for example, front-end engineering, back-end engineering, analytics, and project management. Other programs offered by Digital Challengers supporting individuals in their learning journey are described in Exhibit 40.

#### Exhibit 40

### CEE has many organizations promoting learning about technology



#### Slovakia

##### Mini Tech MBA

The Mini Tech MBA is an educational program created specifically for women. The aim of the program is to provide participants with a comprehensive overview of information technologies and strengthen their digital skills. The basis of the program is a world-class curriculum, created by experts in the field of education in IT in cooperation with specialists from industry.



#### Poland

##### Girls Code Fun

The Girls Code Fun foundation aims to encourage school-aged girls in Poland to pursue an education and/or career in technology. The goal is to show girls that programming and technology is something for them. The foundation offers programming courses for children aged 5–19 and one-time programming workshops for both children and adults based on a curriculum developed by Harvard University.



#### Slovenia

##### Center for Education & Culture, Trebnje

The mission of CIK Trebnje is to promote lifelong learning, develop and provide high-quality and useful education for all generations, while supporting users with the necessary assistance, information, and advice.

##### Simbioza Genesis

All the activities of Simbioza Genesis incorporate three main ideas: intergenerational cooperation, volunteering, and lifelong learning. Core objectives focus on promoting lifelong learning through intergenerational cooperation, helping the elderly acquire basic computer skills, and improving their digital skills and competences.

Source: Organization websites ([minitechmba.org](http://minitechmba.org), [girlscodefun.pl](http://girlscodefun.pl), [ciktrenje.si](http://ciktrenje.si), [simbioza.eu](http://simbioza.eu))

# Closing remarks

The COVID-19 pandemic has caused a massive shift in digital habits across Central and Eastern Europe. At the peak of the pandemic, there were almost 12 million new users of online services in the region—more than the population of Slovakia, Croatia, and Slovenia put together. Many people have started using online channels for services for the first time, and 70 percent plan to use them to the same degree or more after the pandemic. This is clear proof that the changes brought about by the pandemic are structural and here to stay.

Businesses and governments in CEE should ensure that these new converts

not only stay online but genuinely benefit from online services. As we argue in the report, the digital world will be key to ensuring a thriving economy during the recovery—and in the next normal that will follow.

By working together Digital Challengers can develop a clear digital agenda and a toolkit for navigating the digital transformation that lies ahead. We believe that this is the only way for CEE to develop its digital economy effectively, safeguard its digital interests, and ensure continued prosperity growth for the region over the coming decades.

Our hope is that this report, by presenting the evidence in an orderly fashion, raises awareness about the potential for digitization across the CEE region. We have laid out the facts concerning the CEE digital economy, and the labor market, the impact of COVID-19, and the region's fundamentals related to digital. We also have presented a set of implications for policymakers, businesses and individuals. In a dynamically changing world, we believe that our analyses can help make all stakeholders the right decisions—and start taking the right action.

# Methodological appendix

All calculations done for this report were performed using real values for GDP, e-commerce, and consumer offline spending on digital equipment.

## The digital economy

For digital economy calculations we used the same definition as was used in our previous “Digital Challengers” reports, which is used by institutions such as the IMF. It defines the size of digital economy as all digital activities in all sectors of the economy. It ensures that the digital economy in our definition is quantifiable and comparable between countries.

To estimate monthly values of the digital economy in 2020, we used monthly indexes of ICT, e-commerce, and offline spend on electronics.

## Impact scenarios

Our report refers back to the two scenarios calculated in the previous Digital Challengers reports:

## Business-as-usual scenario

- Baseline growth. In this basic scenario for 2025, we assumed that the digital economy continues growing at the historical growth rate for 2012–2016.

## Aspirational scenario

- Digitization potential in the public and private sectors. In the final impact scenario, we assumed that the Digitization Index in CEE will reach the level found in the Digital Frontrunner Sweden. We used Sweden as a benchmark because of its digital maturity and its inspiring digital growth in recent years. To assess the potential impact, we first analyzed productivity and digitization levels in CEE. We then calculated the digitization potential in CEE based on the Swedish sectors' productivity rates, incorporating digitization multipliers. Finally, we estimated the potential

productivity growth in the CEE economy caused by traditional ICT growth compared to the productivity baseline for each country.

- E-commerce and offline spending. In this acceleration scenario for 2025, we assumed fixed growth of e-commerce and consumer offline spending based on the historical weighted-average growth trend for the CEE region between 2012 and 2016.

## Digital Sentiment Survey

The survey was conducted digitally in May 2020. We covered 4 CEE countries—the Czech Republic, Hungary, Poland, and Romania—and surveyed approximately 1,200 users in each of them. All results were adjusted with socio-demographic and internet penetration data to reflect the overall population aged between 18 and 80 years old.

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