

The rise of Digital Challengers

How digitization can become the next growth engine for Central and Eastern Europe

Perspective on the Czech Republic



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About the Digital Challengers research

This report is part of wider research into the potential of the digital economy in Central and Eastern Europe. In our November 2018 report, “The rise of Digital Challengers: How digitization can become the next growth engine for Central and Eastern Europe”, we cover the regional perspective, followed by additional country reports for the Czech Republic, Hungary, Poland, Romania and Slovakia.



Czech Republic



Hungary



Poland



Romania



Slovakia

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Preface

This report presents a perspective on the Czech Republic as part of a wider study analysing the opportunities for the digital economy in Central and Eastern Europe (CEE). Using public sources and proprietary research, we quantify the economic potential of accelerated digitization of the Czech economy. We consider the Czech Republic, alongside nine other markets in the region (Bulgaria, Croatia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia), to be a “Digital Challenger” with potential for accelerated digital economy growth. We compare the Czech Republic and the other Digital Challengers to a group of relatively small, highly digitized countries we refer to as “Digital Frontrunners”, namely Belgium, Denmark, Estonia, Finland, Ireland, Luxembourg, the Netherlands, Norway and Sweden.

Discussion about the opportunities and challenges of digitization has been ongoing for many years. We aim to provide a unique perspective: a comprehensive, fact-based analysis of the size and growth rates of the digital economy and provide realistic scenarios for the economic impact of digitization through 2025. This approach enables us to understand in a quantifiable and comparable way how the digital economy is evolving across countries and against the most relevant benchmarks.

Chapter 1 provides insights on the current level of digitization of individual sectors and the benefits of accelerated digitization of the Czech economy. Chapter 2 addresses the impact of digitization and automation on the labour market. We analyse both the shifts in society caused by the new technology and its ability to drive not only productivity, but also increased participation of demographic groups under-represented in the Czech labour force. Chapter 3 presents a comprehensive, yet prioritised assessment of seven enablers of accelerated digitization in the Czech Republic. Our insights in this chapter are based on quantitative analysis and discussions with market experts. Chapter 4 advocates increased collaboration in CEE to capture regional scale effects, exploit similarities, tackle common challengers and share best practices. Chapter 5

examines the implications for policy-makers, companies and individuals, and contains a list of actions for these stakeholders to capture the digital opportunity.

The ideas we present build on those outlined in our previous reports:

- Digital Europe: Pushing the frontier, capturing the benefits (2016),
- A future that works: Automation, employment, and productivity (2017), and
- Digital Czech Republic: How we grow (2017)

We would like to take this opportunity to thank the authors of these publications as well as the McKinsey Global Institute – in particular Jacques Bughin, Senior Partner in Brussels, and James Manyika, Senior Partner in San Francisco – for their expertise, inspiration and guidance.

The work on this report was led by Jurica Novak, McKinsey’s Managing Partner in Central Europe; Dan Svoboda, Managing Partner in the Czech Republic; Tomas Karakolev, Senior Expert and Leader of Strategy & Corporate Finance; Michal Skalský, Partner and Leader of Digital McKinsey in CEE; with significant contributions by McKinsey Partners Marcin Purta and Tomasz Marciniak, and Associate Partner Karol Ignatowicz in Poland. Kasper Yearwood, Kacper Rozenbaum, Lucie Markova, Petr Kotesovec, Joanna Iszkowska, Milena Tkaczyk, Małgorzata Leśniewska and many others carried out the analyses and contributed to the writing of the report.

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

The Czech Republic as a Digital Challenger

For the Czech Republic, accelerated digitization can deliver up to EUR 26 billion in additional gross domestic product (GDP) by 2025, or almost one percentage point of GDP growth p.a. This could bring higher competitiveness and prosperity and make Czech Republic one of the most advanced economies in Europe.

1 THE CURRENT GROWTH ENGINES OF THE CZECH REPUBLIC ARE LOSING MOMENTUM

Over the past 20 years, the Czech Republic has experienced rapid development (GDP per capita grew by 62% between 1996–2017), fueled by traditional industries, dynamic exports, investments from abroad, a growing workforce combined with labour-cost advantages, as well as funding from the European Union. The growth potential of many of these drivers is nearly exhausted, for example unemployment is at record low levels (2.9% in 2017). New sources of productivity growth are needed if the Czech Republic hopes to continue on its path to increased prosperity.

2 ACCELERATED DIGITIZATION COULD INCREASE PRODUCTIVITY GROWTH BY ~70%, WITH EUR 26 BN OF INCREMENTAL GDP BY 2025 AT STAKE

Our analysis shows that creating a digital, tech-driven economy can be the growth engine that the country urgently requires. Closing the gap to Western and Northern European economies could bring up to EUR 26 billion in incremental GDP by 2025. In this aspirational trajectory, the share of the country's digital economy would double (from 8 to 16% of GDP) by 2025, increasing GDP growth by almost one extra percentage point each year over the period. This means around 50% higher GDP growth and around 70% higher productivity growth compared

to last ten years. The alternative “business as usual” trajectory would maintain historical growth rates: the digital economy would expand only by EUR 11 billion and reach an 11% share of GDP by 2025. In this scenario, the Czech Republic would still lag behind the “digital frontier” represented by countries such as Sweden.

3 THE CZECH REPUBLIC IS UNIQUELY POSITIONED TO CAPTURE THE DIGITAL OPPORTUNITY

In this report we consider the Czech Republic to be one of ten Digital Challenger markets based in Central and Eastern Europe. The Czech Republic has strong foundations on which to accelerate its digitization. The digital economy in the Czech Republic already accounted for 7.8% of GDP in 2016 – almost halfway between the 9.0% of Sweden, one of the examples of best performing Digital Frontrunners markets (Belgium, the Netherlands, Luxembourg, Denmark, Finland, Norway, Sweden, Estonia and Ireland)¹ and the 6.9% achieved by the EU Big 5 markets (France, Germany, Italy, Spain and United Kingdom). The Czech digital economy grew by 6.6% p.a. during 2012–2016, more than twice as fast as that in the EU Big 5. In some sectors, such as financial services and manufacturing, the Czech Republic achieved higher digitization rates than the EU Big 5. Additional advantages are a large STEM and ICT graduate talent pool, high-quality digital infrastructure, as well as a legacy technology lock-in that is milder than in Western and Northern Europe. The Czech Republic performs above the CEE average in several important digitization enabling areas: adoption of digital skills among individuals, adoption of digital tools among enterprises and participation rates in adult learning.

4 THE GOVERNMENT, BUSINESS LEADERS AND INDIVIDUALS ALL NEED TO ACT TO ACCELERATE DIGITIZATION

To achieve the aspirational digitization trajectory, the Czech Republic will have to mobilise all stakeholders. Companies need to increase their adoption of digital tools, taking advantage of digital solutions for improving their productivity

and profitability and reaching new customers. Using digital technology, companies can better grow internationally and challenge industry boundaries, creating new, international ecosystems of services. The public sector could embrace technologies increasing efficiency and improving its services to both companies and citizens. For individuals, investment in lifelong learning for upskilling & reskilling will be the key to taking advantage of new labour market opportunities. Policy-makers are called upon to promote the adoption of technology in both the public and private sectors. They can also support workers through reskilling and upskilling programmes, and improve the ecosystem for startups and the opportunities for digital innovation.

5 COLLABORATION WITH OTHER CEE COUNTRIES AS DIGITAL CHALLENGERS

The countries of CEE, the Czech Republic included, can benefit from cooperating closely. Four reasons underpin the benefits of joint action:

- Scale effects: The CEE Digital Challengers represent EUR 1.4 trillion in GDP – seven times the size of the Czech economy and more than the economy of Russia. Promoting digital solutions across the region can help reduce the cost of cross-border trade and enable Czech enterprises to tap into this potential.
- Similar starting points: the Czech Republic, like other CEE markets, exhibits high levels of market openness and similar levels of digitization, besides cultural and historic commonalities.
- Common challenges: the Czech Republic faces the same challenges as many other CEE markets, importantly the need of pro-business regulatory improvements and workforce reskilling. Joint efforts across the region can help in finding and implementing the most effective solutions

- Best practices: the Czech Republic has developed different strengths related to the digital economy compared to other CEE markets – sharing best practices can accelerate digitization. Encouraging regional coordination and planning could speed up the development of the digital economy by replicating successful strategies already tested elsewhere.

In the future, the Czech Republic along with other Digital Challengers could work together on digital projects and policy solutions across the region – all with the aim of facilitating digital transformation. Also, a pan-CEE coalition could ensure the digital interests of the region's countries are heard at the European level.

6 THE TIME TO ACT IS NOW – OR THE CZECH REPUBLIC MAY MISS THE DIGITAL OPPORTUNITY

We believe that in order to benefit fully from the digital transformation, the time to act is now. The Czech Republic is booming economically; however, history shows that booms do not last forever. Multiple signs already indicate limitations to further growth. Also, technology is poised to fundamentally transform the Czech labour market - our analysis shows that up to 52% of today's workplace activities could be automated using existing technology. Even in a middle technology adoption scenario the equivalent of 1.1 million jobs would be automated by 2030. While boosting productivity, this will bring challenges, for example, that of transitioning people to new jobs. Immediate action is needed to address the required upskilling and reskilling. Finally, now is the time when global rules of the digital game are crystallising. To effectively navigate the digital transformation ahead, a clear digital agenda across the CEE region and in the Czech Republic is needed.

Česká republika jako digitální vyzyvatel

České republice může zrychlení digitalizace do roku 2025 přinést až 26 miliard EUR dodatečného hrubého domácího produktu (HDP), což znamená navýšení roční míry růstu HDP o téměř jeden procentní bod. Tím by se mohla zvýšit konkurenceschopnost a prosperita země a z České republiky by se stala jedna z nejpokročilejších ekonomik v Evropě.

1 STÁVAJÍCÍ ZDROJE RŮSTU V ČESKÉ REPUBLICE SE VYČERPÁVAJÍ

V posledních dvaceti letech zažila Česká republika rychlý rozvoj (nárůst HDP na obyvatele o 62% v letech 1996-2017) a to díky tradičním průmyslovým odvětvím, dynamickému vývozu, zahraničním investicím a nárůstu pracovní síly spolu s výhodnou výší nákladů na práci, a také díky financování z Evropské unie. Avšak tyto tradiční hnací síly začínají narážet na své limity, například nezaměstnanost je na rekordně nízké úrovni (2,9% v roce 2017). Pokud chce Česká republika setrvat na své cestě za větší prosperitou, potřebuje nové zdroje růstu produktivity.

2 ZRYCHLENÁ DIGITALIZACE BY MOHLA PŘINÉST RŮST PRODUKTIVITY VYŠŠÍ AŽ O 70% A DO ROKU 2025 DODATEČNÝCH 26 MILIARD EUR V HDP

Z naší analýzy vyplývá, že digitální ekonomika založená na technologiích se může stát hnací silou růstu, kterou tato země naléhavě potřebuje. Pokud v digitalizaci srovnáme krok se zeměmi západní a severní Evropy, může nám to do roku 2025 přinést dodatečné HDP ve výši 26 miliard EUR. V tomto ambiciózním scénáři by se do roku 2025 zdvojnásobil podíl digitální ekonomiky v zemi (z 8 na 16% HDP) a růst HDP by se každý rok v daném období urychlil o téměř jeden procentní bod. To znamená o 50% vyšší růst HDP a o 70% vyšší růst produktivity oproti minulým 10 letům. Alternativní scénář „business as usual“ by znamenal zacho-

vání historického tempa růstu: digitální ekonomika by do roku 2025 vzrostla pouze o 11 miliard EUR a dosáhla by 11% podílu HDP. V tomto scénáři by Česká republika dále zaostávala za zeměmi, které v digitalizaci zaujímají přední místa v Evropě, jako například Švédsko.

3 ČESKÁ REPUBLIKA MÁ JEDINEČNÉ POSTAVENÍ PRO VYUŽITÍ PŘÍLEŽITOSTÍ, KTERÉ PŘINÁŠÍ DIGITALIZACE

V této zprávě označujeme Českou republiku za jeden z deseti trhů tzv. digitálních vyzyvatelů („Digital Challengers“) ve střední a východní Evropě. Česká republika má dobré předpoklady, díky kterým může svou digitalizaci urychlit. Digitální ekonomika již v roce 2016 tvořila v České republice 7,8% HDP – což je téměř na půl cesty mezi 9,0% ve Švédsku, jako v jednom z nejlepších tzv. digitálních šampionů – Digital Frontrunners (Belgie, Nizozemsko, Lucembursko, Dánsko, Finsko, Norsko, Švédsko, Estonsko a Irsko) a 6,9%, kterých dosahuje pět velkých trhů v EU (Francie, Německo, Itálie, Španělsko a Velká Británie). Česká digitální ekonomika rostla během let 2012–16 o 6,6% ročně, více než dvojnásobným tempem než digitální ekonomika velké evropské pětky. V některých sektorech, např. finančních službách a průmyslové výrobě, dosáhla Česká republika dokonce vyššího tempa digitalizace oproti těmto pěti velkým zemím EU. Dalšími výhodami je velký počet talentovaných lidí a absolventů oborů ICT a STEM (věda, technika, inženýrství a matematika), vysoce kvalitní digitální infrastruktura a historicky daná nižší míra závislosti na zastaralých technologiích v porovnání se zeměmi západní a severní Evropy. Česká republika dosahuje nadprůměrných výsledků v rámci zemí střední a východní Evropy v několika zásadních oblastech umožňujících digitalizaci: osvojování digitálních dovedností jednotlivci, zavádění digitálních nástrojů v podnicích a vysoká účast dospělých na dalším vzdělávání.

4 NA RYCHLEJŠÍ DIGITALIZACI SE MUSÍ PODÍLET VLÁDA, PODNIKY I JEDNOTLIVCI

Aby Česká republika mohla naplnit svůj ambiciózní scénář digitalizace, musí zmobilizovat všechny zainteresované strany. Podniky musí zvýšit tempo zavádění digitálních nástrojů a využívat výhody digitálních řešení ke zlepšení

produktivity a ziskovosti a oslovování nových zákazníků. Díky digitálním technologiím mohou podniky snáze expandovat do zahraničí, posouvat hranice oborů a vytvářet nové, mezinárodní ekosystémy služeb. Veřejný sektor by měl zavést technologie, kterými zvýší svou efektivitu a zlepší dostupnost a přívětivost veřejných služeb pro firmy i občany. Klíčovým předpokladem k tomu, aby výhody nových příležitostí na trhu práce mohli využít i jednotlivci, bude jejich ochota investovat do celoživotního učení, případně přikročit k rekvalifikaci. Političtí představitelé by měli propagovat zavádění technologií jak ve veřejném, tak v soukromém sektoru. Mohu také podporovat pracovníky prostřednictvím programů rekvalifikace či zvyšování kvalifikace, zlepšit prostředí pro startupy a nabídnout příležitosti pro digitální inovaci.

5 SPOLUPRÁCE S DALŠÍMI DIGITÁLNÍMI VYZYVATELI VE STŘEDNÍ A VÝCHODNÍ EVROPE

Země střední a východní Evropy včetně České republiky mohou těžit ze vzájemné úzké spolupráce. Pro společný postup hovoří čtyři důvody:

- Využití efektu rozsahu: HDP digitálních vyzvateľů ze zemí střední a východní Evropy představuje 1,4 bilionů EUR – což je sedminásobek velikosti české ekonomiky a více než je velikost ekonomiky Ruska. Prosazování digitálních řešení v regionu může pomoci snížit náklady na přeshraniční obchod a umožnit tak českým podnikům využít potenciál, který celý tento region nabízí.
- Podobná výchozí pozice: Česká republika stejně jako další trhy střední a východní Evropy vykazuje vysokou otevřenost trhu, podobnou míru digitalizace a navíc všechny tyto země mají podobné kulturní a historické pozadí.
- Společné výzvy: Česká republika čelí stejným výzvám jak mnoho ostatních trhů střední a východní Evropy, především nutnosti zlepšení institucionálního prostředí pro podnikání a potřebě rekvalifikace pracovní síly. Společné úsilí celého regionu může pomoci najít a realizovat nejučinnější řešení.

- Příklady dobré praxe: Česká republika oproti ostatním trhům střední a východní Evropy disponuje mnoha silnými stránkami v oblasti digitální ekonomiky – sdílení osvědčených postupů a příkladů dobré praxe může digitalizaci urychlit. Prosazování koordinovaného postupu v rámci regionu může akcelarovat vývoj digitální ekonomiky pomocí replikování úspěšných strategií, které již byly vyzkoušeny jinde.

V budoucnosti by mohla Česká republika spolupracovat s dalšími digitálními vyzvateli na digitálních projektech a strategických řešeních v celém regionu s cílem usnadnit digitální transformaci. Koalice všech zemí střední a východní Evropy by mohla také pomoci obhájit zájmy zemí tohoto regionu na evropské úrovni.

6 MUSÍME JEDNAT NYNÍ – JINAK MŮŽE ČESKÁ REPUBLIKA DIGITÁLNÍ PŘÍLEŽITOSTI PROMEŠKAT

Máme za to, že abychom mohli dobře využít příležitosti digitální transformace, musíme začít jednat nyní. Česká republika zažívá hospodářský rozkvět, avšak minulost ukazuje, že rozkvět netrvá věčně. Mnoho signálů již nyní jasně naznačuje, že růst naráží na limity. Technologie zásadně promění český trh práce – z naší analýzy vyplývá, že až 52% stávajících pracovních úkonů lze automatizovat pomocí technologií, které již existují. I v případě scénáře, kdy budeme technologie zavádět středním tempem, bude do roku 2030 automatizován ekvivalent 1,1 milionu pracovních míst. To přinese vyšší produktivitu, ale také výzvy při hledání nové práce pro lidi, jejichž práci nahradily stroje. Příprava na tyto situace vyžaduje okamžité kroky. V neposlední řadě žijeme v době, kdy se ujasňují pravidla digitalizace v celosvětovém měřítku. Abychom akcelerovali digitální transformaci, potřebujeme v celém regionu střední a východní Evropy a také v České republice jasnou strategii.

The Czech Republic and Digital Challengers at a glance

Looking at Europe from the perspective of economy and digitization, three broad groups of countries have emerged.

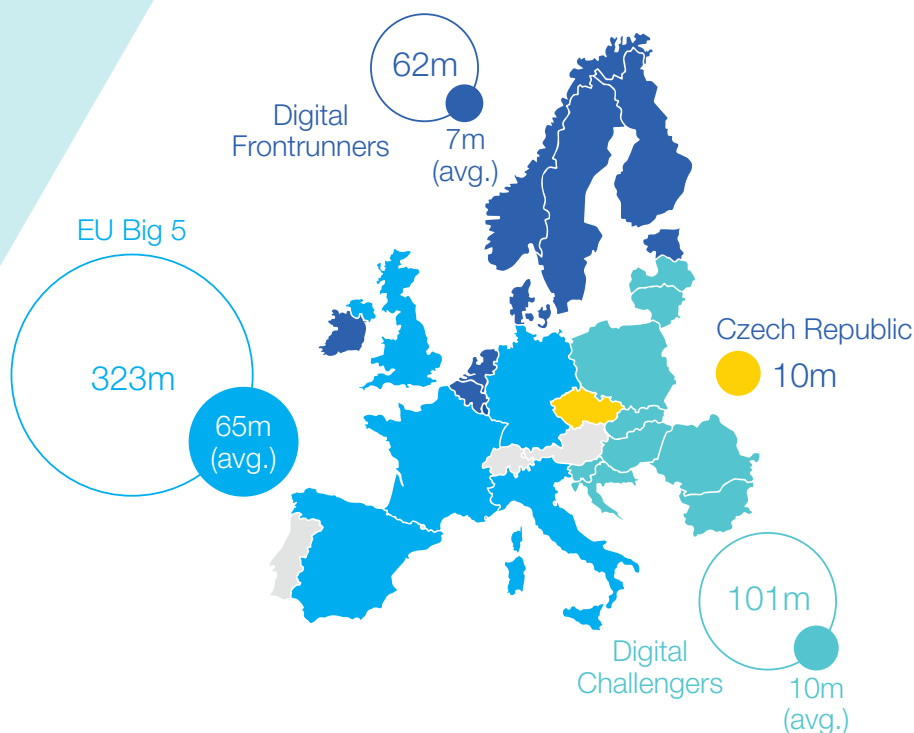
The first group is formed by relatively small, open economies with very high digitization rates. This so-called Digital Frontrunners group comprises Northern European and Benelux countries: Belgium, the Netherlands, Luxembourg, Denmark, Finland, Norway, Sweden, Estonia and Ireland.²

The second group is composed of the five biggest economies in the EU (called the EU Big 5) – France, Germany, Italy, Spain and the United Kingdom. Compared to the first group, these countries typically exhibit much lower market openness, relying more on their large internal markets. The EU Big 5 are also characterised by lower, albeit still high, digitization rates.

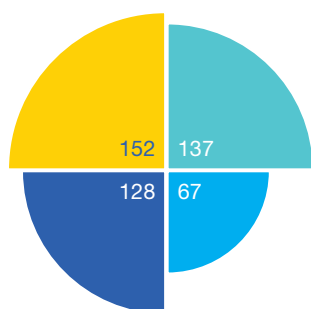
Finally, there are ten countries of Central Eastern Europe – Bulgaria, Croatia, the Czech Republic, Hungary, Latvia, Lithuania, Romania, Slovakia, Poland and Slovenia. About 30 years ago these countries emerged from the centrally planned communist bloc, built market-oriented economies and are trying to converge to Western Europe in terms of productivity and living standards.

The Czech Republic has enjoyed significant economic growth since the 1990s. Gross domestic product (GDP) per capita grew by 62% between 1996 and 2017. The main growth drivers in this period were traditional industries, dynamic exports, investments from abroad, labour-cost advantages and the inflow of EU funds. But now these drivers are beginning to lose their momentum. Further employment growth, which delivered about third of the GDP growth in the last decade, is constrained by a record low level of unemployment – 2.9% in 2017. As a result, workforce costs are rising in terms of hours worked per employee, Czechs are ahead of the EU Big 5 and Digital Frontrunners and close to 90% of the EU leader in this category - Poland. The Czech economy is undercapitalised compared to more advanced European economies: the ratio of capital, measured as net assets per employee, is more than 34% lower than in that of the EU Big 5 and 62% lower than that of the Digital Frontrunners. Moreover, productivity lags behind Western Europe and its growth has in the last 10 years slowed down to just 1.1%. The inflow of EU funds to the Czech Republic is also likely to weaken after 2020. As a result, the Czech Republic needs a new engine to continue its economic growth.■

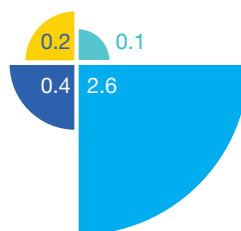
POPULATION IN TOTAL
VS. COUNTRY AVERAGE



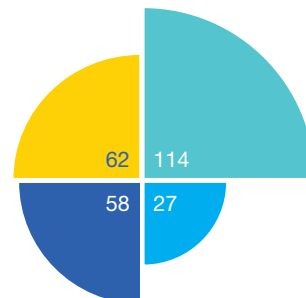
MARKET OPENNESS, 2017,
TRADE AS % OF GDP



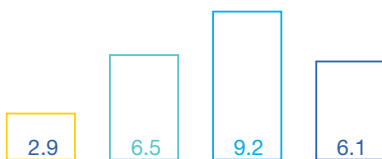
GDP COUNTRY AVERAGE
EUR trillion



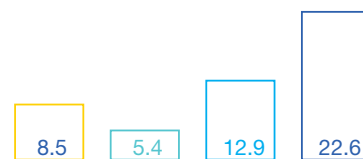
GDP PER CAPITA GROWTH
1996-2017, %



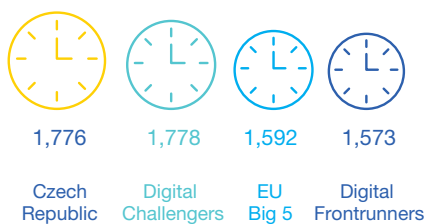
UNEMPLOYMENT,
2017, %



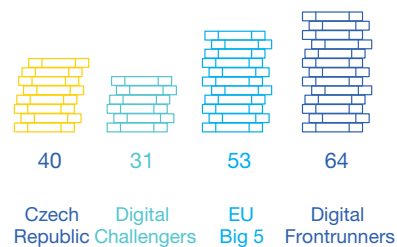
CAPITAL STOCK
PER EMPLOYEE,
2016, EUR m



WORKING
HOURS PER
YEAR, 2017



PRODUCTIVITY,
2017, GDP per
hour worked in
EUR



EU BIG 5: France, Germany, Italy, Spain, United Kingdom

Digital Frontrunners: Belgium, Denmark, Estonia, Finland, Ireland, Luxembourg, the Netherlands, Norway, Sweden

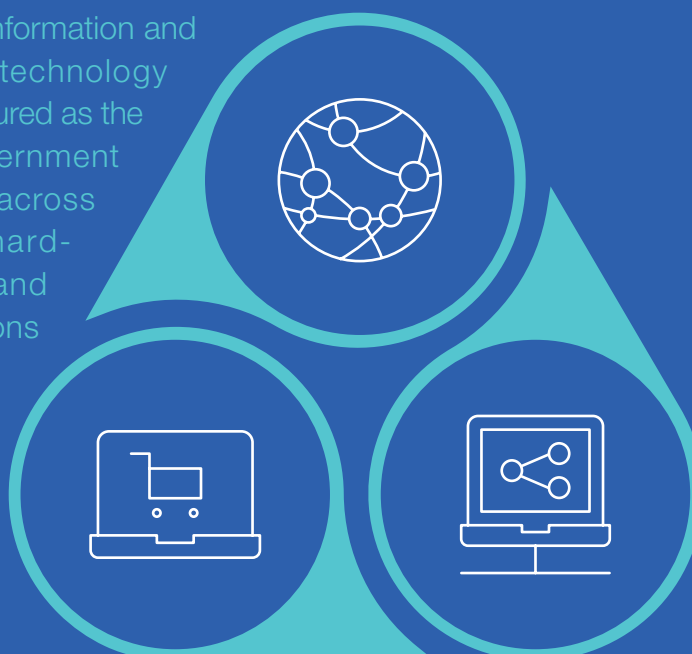
Digital Challengers: Bulgaria, Czech Republic, Croatia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia

Our approach to measuring the digital economy in the Czech Republic

The term “digitization” is widely used by economists. Yet its precise meaning is a topic of much discussion, particularly when it comes to measuring its impact on economies.⁴ Consequently, uncertainty reigns about the scale of the digital economy in the Czech Republic and CEE.

In this report on the Czech Republic, similarly to its CEE edition, we try to strike a balance between the various definitions of “digitization” as it pertains to the digital economy. We define it as the sum of three components:

The value of the information and communication technology (ICT) sector, measured as the spending of government and companies across all sectors on hardware, software and telecommunications solutions

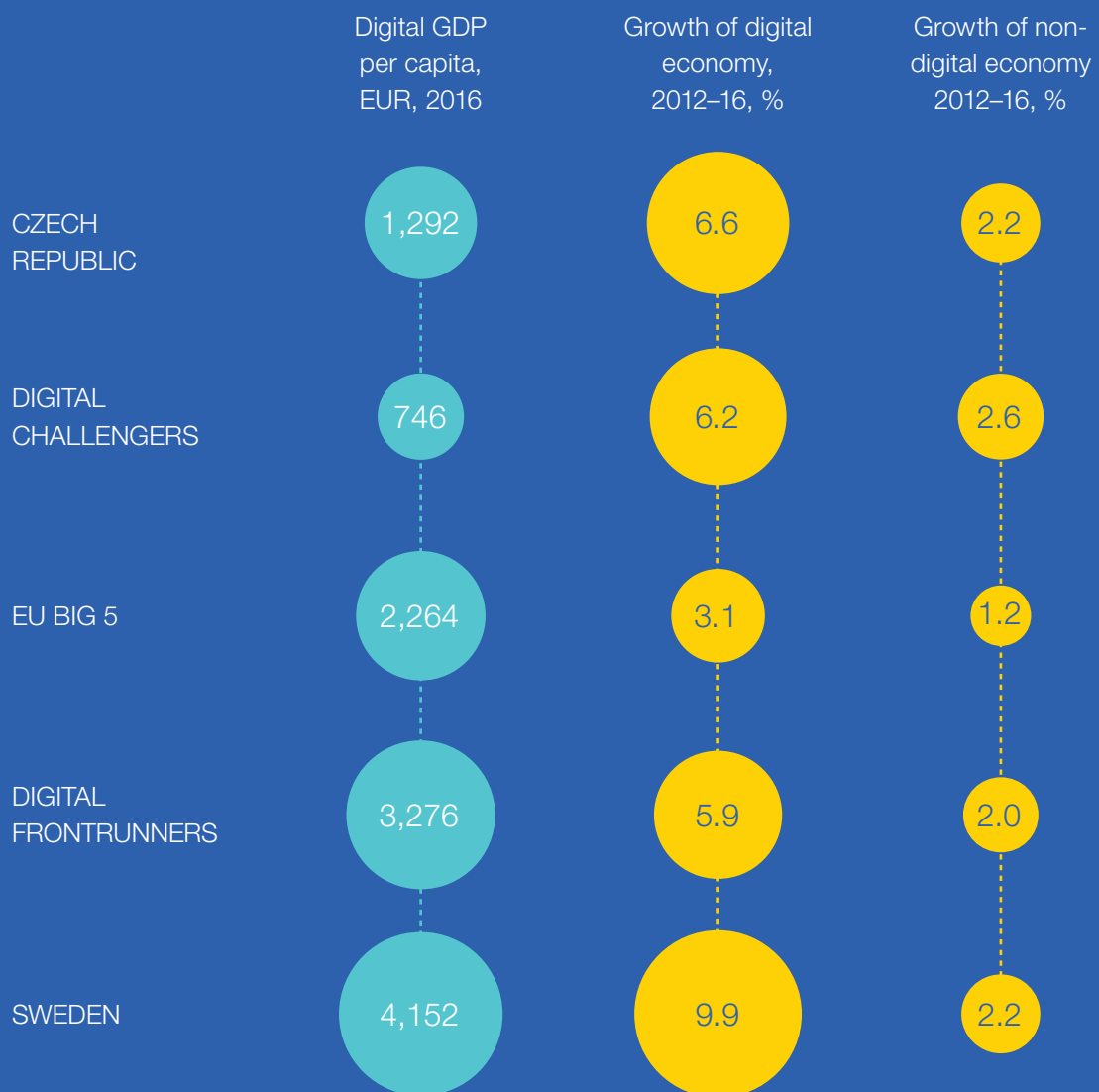


The value of the e-commerce market, measured as online purchases of goods and services by consumers

The value of offline consumer spending on digital equipment

As discussed in *The Rise of Digital Challengers* (CEE perspective) report,³ we have chosen this definition for two main reasons. First, it is relatively comprehensive – broader than just the ICT sector, yet more concrete than, say, “all activities related to digital data”. Second, reliable data is available for each of the three areas it covers and so its total value can be easily calculated (see Methodology appendix). This enables us to use a bottom-up modeling approach drawing on data collected at the national level.

The size and growth of the digital economy in the Czech Republic



According to our analysis, the digital economy accounted for 7.8% of the Czech Republic's total GDP in 2016. While this is clearly above the CEE average of 6.5%, it lags behind Digital Frontrunner markets such as Sweden, where the share is about 15% higher. Furthermore, the digital economy in per capita terms is 3–4 times larger in Digital Frontrunners: it is about EUR 1,300 in the Czech Republic, compared to more than EUR 3,000 in Digital Frontrunner markets and more than EUR 4,000 in Sweden alone.

Importantly, the Czech digital economy has been growing faster than its counterparts in the EU Big 5 and Digital Frontrunners. While this is a positive indicator, room for improvement clearly remains. Despite starting from a higher level, Sweden was able to grow its digital economy by 9.9% a year between 2012 and 2016, for example. With enough extra effort, the Czech Republic could accelerate the pace of growth of its digital economy and catchup the most digitally advanced economies

Sector-level digitization in the Czech Republic

Before identifying potential levers for achieving accelerated growth in the Czech Republic, we should look at the manner in which digitization has already taken place around the world. An examination of global trends indicates that there is no standard route to achieving high rates of digitization. Most markets, including Digital Frontrunners, have digitized unevenly, with large variations between different sectors and individual companies. To understand which sectors drive digitization at a macro level, we need a multidimensional view. The McKinsey Global Institute (MGI) Industry Digitization Index offers such a perspective, assessing digitization at the level of individual sectors. It uses eight indicators to capture different ways in which companies are digitizing. All results at sector level are weighted for the economic size of the sector and compared to the global digital frontier, namely the ICT sector in the United States.

MGI Industry Digitization Index

Digital asset spending



Hardware spending

Share of total expenditure spent on ICT hardware (e.g., computers, servers)

Software and IT services spending

Share of total expenditure spent on software and IT services (e.g., enterprise resource planning software)

Telecommunications spending

Share of total expenditure spent on telecommunications (e.g., broadband access, mobile data services)

Digital asset spending per worker



Hardware spending on workers

ICT hardware (e.g., computers, servers) expenditure per full-time-equivalent employee (FTE)

Software and IT services spending per worker

Software (e.g., enterprise software licenses) and IT services expenditure per FTE

Telecommunications spending per worker

Telecommunications (e.g., broadband access, mobile data services) expenditure per FTE

Digital capital deepening



Hardware assets per worker

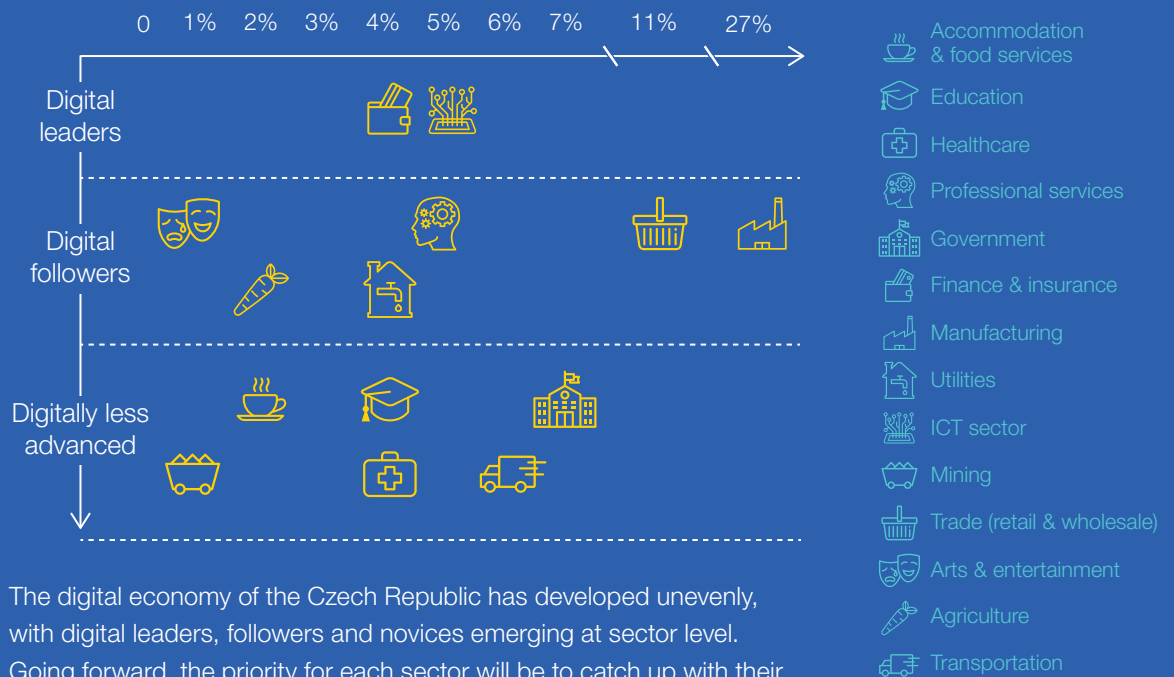
ICT hardware assets (e.g., servers, computers) per FTE

Software assets per worker

Software assets (e.g., workers' software licenses) per FTE

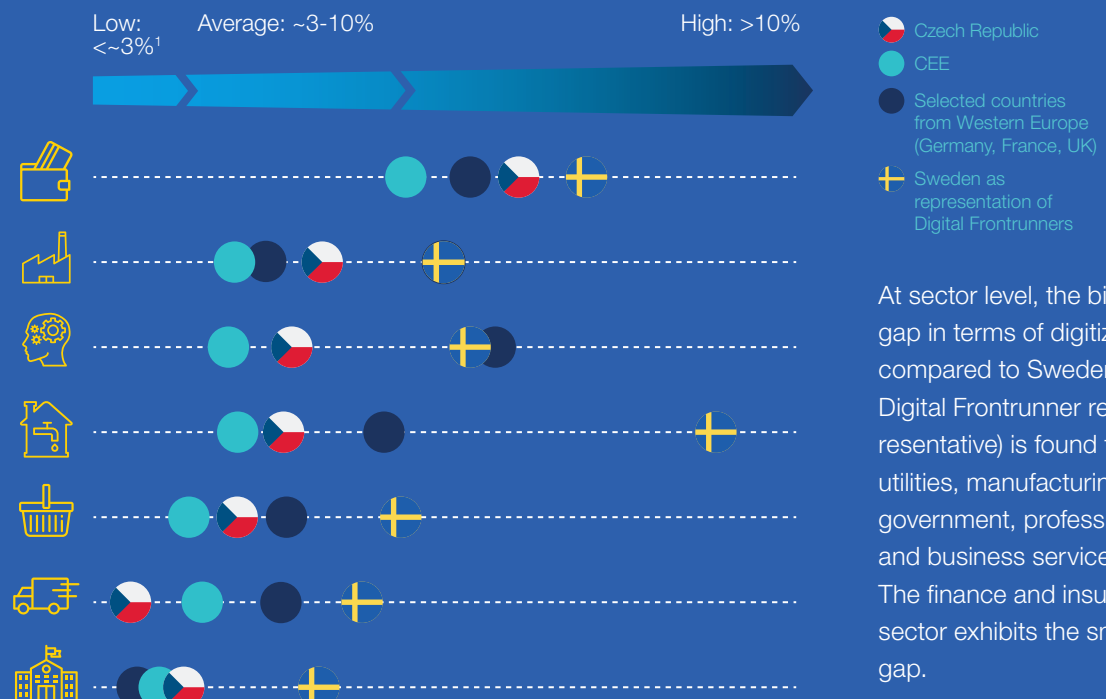
SECTOR-LEVEL DIGITAL LEADERS, FOLLOWERS AND NOVICES IN THE CZECH REPUBLIC

Share of GDP, %



The digital economy of the Czech Republic has developed unevenly, with digital leaders, followers and novices emerging at sector level. Going forward, the priority for each sector will be to catch up with their counterparts in digitally more advanced countries.

SECTOR DIGITIZATION IN THE CZECH REPUBLIC COMPARED TO CEE, EU BIG 5 AND DIGITAL FRONTRUNNER BENCHMARKS



At sector level, the biggest gap in terms of digitization, compared to Sweden (a Digital Frontrunner representative) is found for utilities, manufacturing, government, professional and business services. The finance and insurance sector exhibits the smallest gap.

Accelerated digitization can drive growth in the Czech Republic

Looking ahead, we see two potential trajectories for further digitization in the Czech Republic.

In the first “business as usual” trajectory, the Czech digital economy maintains its historical growth rate and expands by EUR 11 billion to reach 11% of GDP by 2025. In terms of the digital economy’s share of GDP, the gap increases to the most advanced and dynamic markets, such as Sweden.

The second “aspirational” trajectory closes the gap to Digital Frontrunners in terms of the per capita digital economy intensity. This would see the Czech digital economy growing by EUR 26 billion to reach 16% of GDP by 2025, translating into an extra 0.8 percentage point GDP growth each year. This corresponds to around 50% higher GDP growth and around 70% higher rate of productivity growth compared to recent years. The additional EUR 16 billion, on top of the EUR 11 billion impact of maintaining the historical growth rate, is made up of:

- EUR 10 billion from closing the gap to Digital Frontrunners in digitization of the public and private sectors
- EUR 6 billion from extra growth in e-commerce and consumer offline spending on digital equipment

The first of these amounts (closing sectoral digitization gaps to Digital Frontrunners) comes from the Czech Republic increasing its ICT spending levels (as a share of sector GDP) to match Digital Frontrunner markets. To achieve this, acceleration of the digital transformation is required, especially in those sectors which lag farthest behind their Digital Frontrunner benchmarks and at the same time account for a significant share of the Czech economy. This includes asset-heavy sectors such as manufacturing and retail trade and the people-heavy public sector.

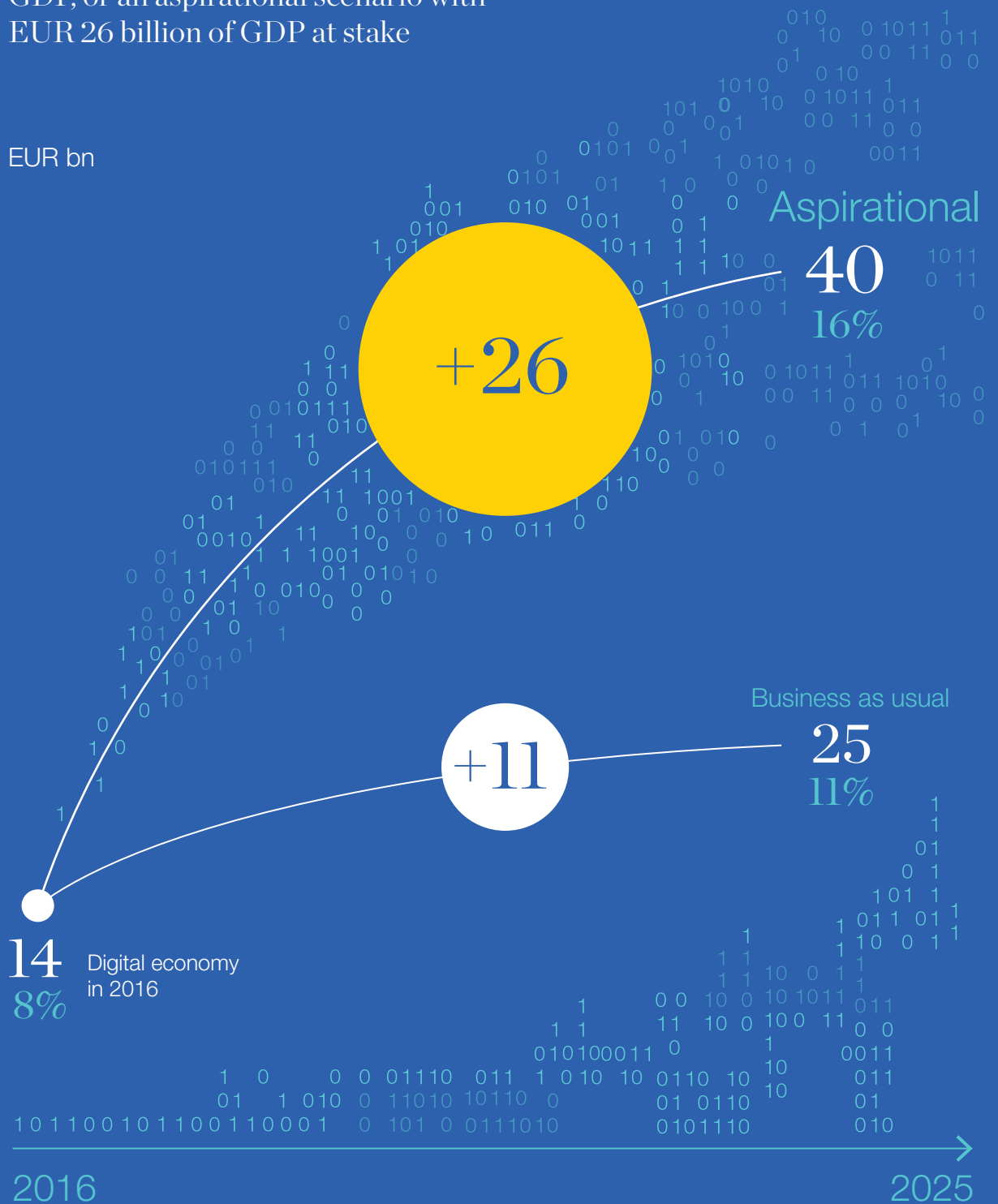
The second amount comes from faster growth in e-commerce and offline consumer spending on digital equipment (for more details, see the Methodology appendix).

Capturing the potential will depend on all stakeholders embracing digital technology in the coming years. For companies, it means taking advantage of solutions that enable growing sales through digital channels, including boosting their export capabilities. For both public and private organisations, it means improving operating efficiency by integrating automation and streamlining solutions. For individuals, it means investing in developing the skills needed in the digital economy.■

We see two trajectories for the Czech Republic to grow its digital economy – a business as usual scenario bringing an additional EUR 11 billion of GDP, or an aspirational scenario with EUR 26 billion of GDP at stake

X% - Share of GDP

EUR bn



The potential for work automation in the Czech Republic

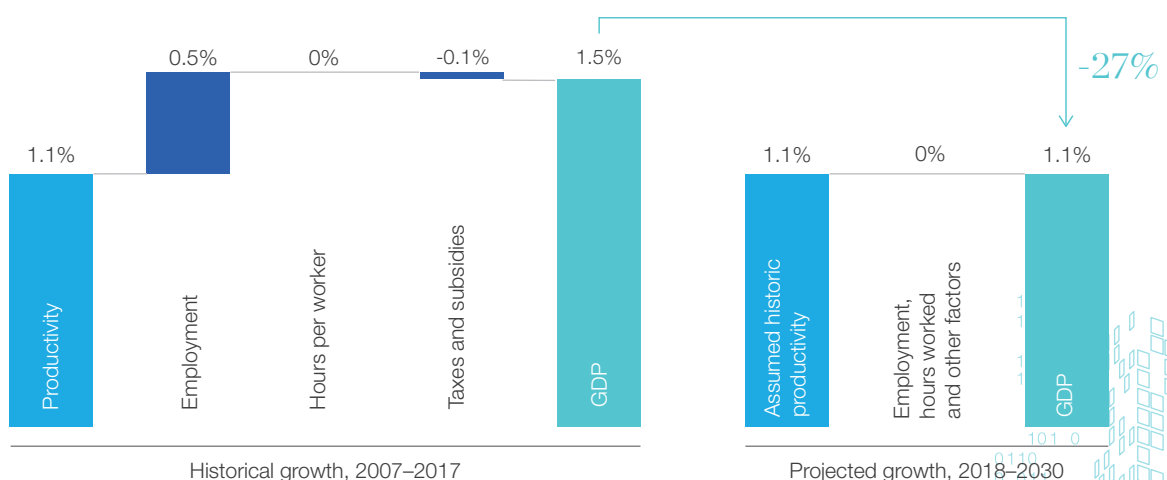
In the long term, the standards of living in a country are primarily determined by the growth of GDP per capita. As the Czech Republic and the other Digital Challengers aim to close the gap in living standards to Western Europe, they need to grow their GDP. The Czech Republic has done well over the past 20 years with its GDP increasing by 62%, i.e., over 2.4% p.a. between 1996 and 2016. However, over decade from 2007 to 2017, increases in the Czech GDP slowed to 1.5% p.a. Employment growth alone was responsible for around a third of that growth. A growing consensus exists that the Czech Republic has now reached its peak employment level. Negative demographic trends such as declining birthrates and aging could hinder future employment-driven growth. In addition, the Czech Republic is also ahead of the EU average in hours worked per employed person. Over the past decade, average hours worked per annum in the Czech Republic hovered around 1,784 vs. currently 1,630 for the EU 28. Assuming

flat employment projections and flat hours worked and no contribution from other factors such as subsidies and taxes, future GDP would be driven just by productivity growth. With productivity growth at historical levels, the GDP growth in the Czech Republic would slow down to 1.1% or less than half the growth since 1996. As a result, the convergence of the Czech Republic to Western Europe would stall.

One of the sources of productivity acceleration in the future may come in the form of automation technologies. We estimate that in the Czech Republic up to 52% of workplace activities today – the equivalent of ca. 2.4 million jobs – could be automated using technology that already exists today⁵. This is close to the potential for the entire region, which we have estimated at 49-51%⁶. In a middle technology adoption scenario, this would lead to automation of the equivalent of 1.1 million jobs in the Czech Republic by 2030⁷.

Without an acceleration in productivity growth, demographic trends might cut GDP growth in the Czech Republic

Projected long-term impact of employment growth on GDP (compound annual growth)



Note: Projection assuming historical productivity growth and change in the employment growth
 SOURCE: MGI, McKinsey analysis

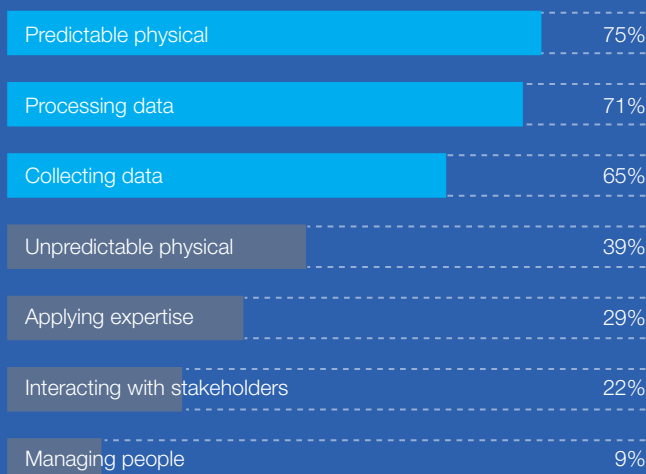
52%

equivalent number of jobs that could be automated in the Czech Republic

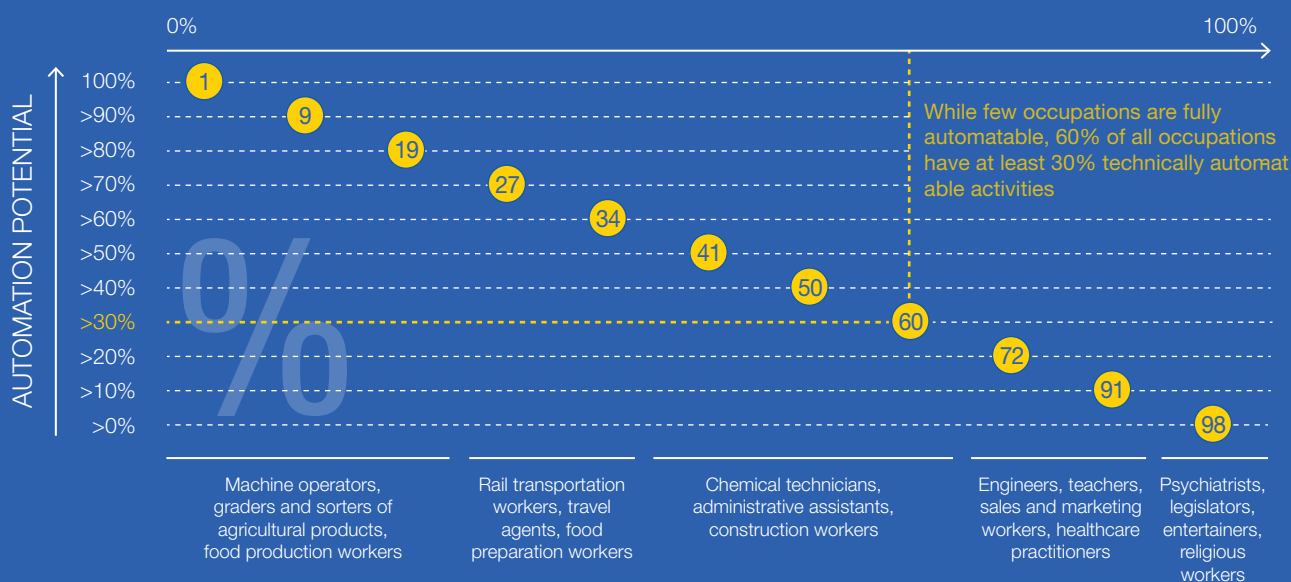
of working time in the Czech Republic is spent on activities that could be automated

2.4m

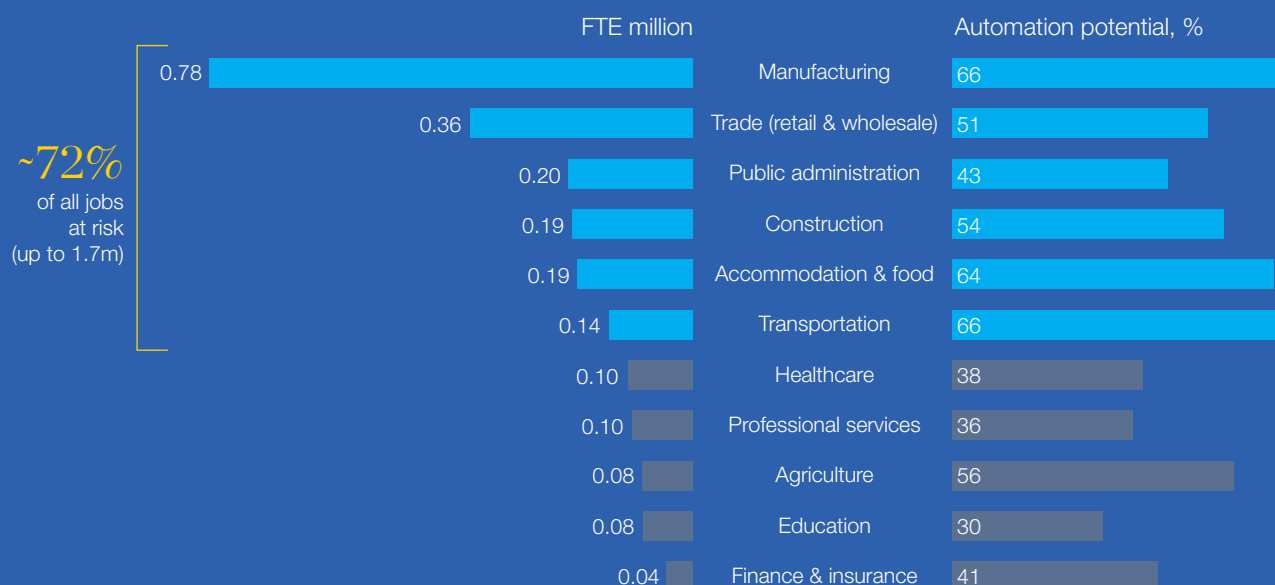
AUTOMATION POTENTIAL BY TYPE OF ACTIVITY



SHARE OF OCCUPATION TYPES (100% = 820 occupation types)



TOTAL AUTOMATION POTENTIAL IN EQUIVALENT NUMBER OF JOBS



Opportunities and challenges of work automation

AUTOMATION CAN HELP DE-BOTTLENECK INDUSTRIES WITH HIGH JOB VACANCY RATES

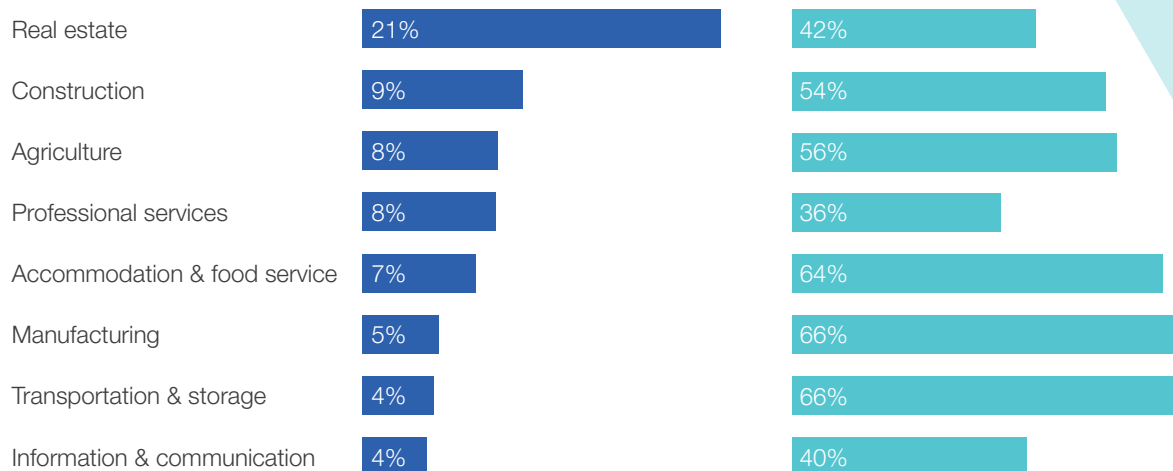
Automation brings new opportunities as well as concerns. Technology adoption can be a significant productivity contributor leading to stronger economic development. In the labour market, it allows employees to focus on more value-adding activities. For example, doctors and nurses could spend more time with patients rather than on performing administrative tasks.⁸ Additionally, for industries with the highest job vacancy rates automation mitigates the problem of the inadequate labour supply. In recent years, relatively low unemployment rates and a

growing number of job vacancies in Czech markets have created a favourable labour market situation for employees and challenges for employers.⁹ Sectors such as accommodation, manufacturing, transportation, agriculture and construction – all areas with a high potential for automation – have in recent years faced the biggest labour shortages.¹⁰ Digitization and automation could help companies in these sectors overcome workforce-related barriers and accelerate growth.

Industries with the highest job vacancy rates¹¹ in the Czech Republic could benefit from automation, unlocking economic growth stifled by an inadequate labour supply

Industries with the highest job vacancy rate in CEE, Q4 2017

Automation potential % of time



SOURCE: Eurostat, McKinsey Global Institute

STRUCTURE OF EMPLOYMENT WILL CHANGE FASTER THAN BEFORE

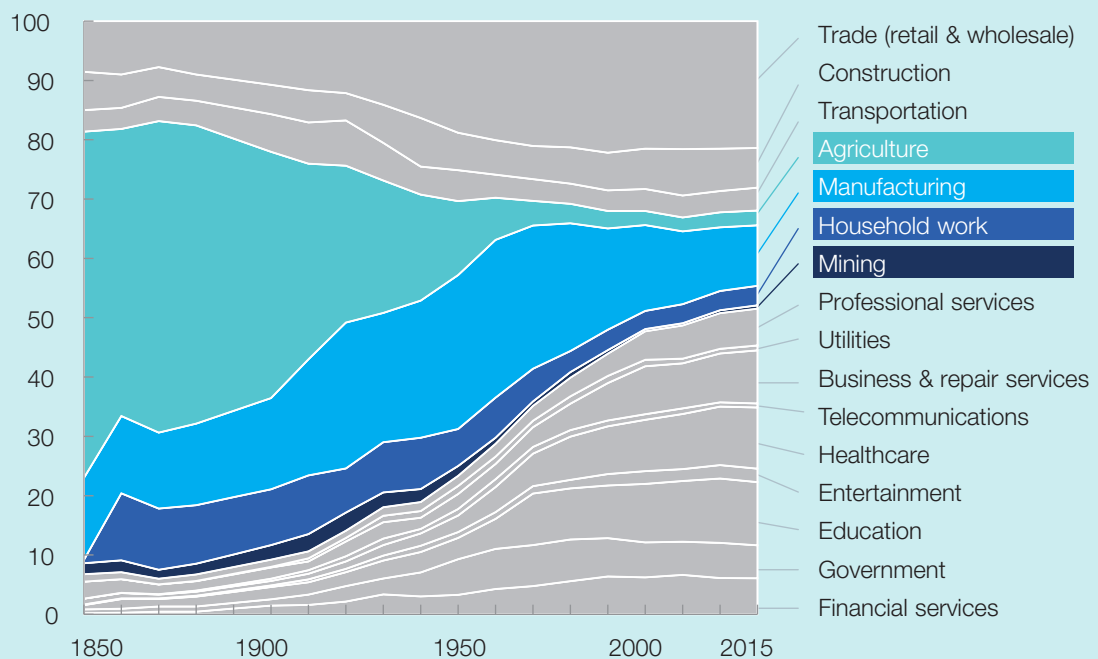
At the same time, some employees will find that their professions will alter significantly, with a greater range of their previous tasks completed by technologies. New requirements (e.g., working more closely with technology) are emerging. In some extremes, workers may find that they are no longer required in their specific professions. For those who lose their jobs, finding a new position may be challenging and they will have to acquire new skills and competencies.

Such employment shifts have accompanied technological advances in the past. For example, over the past 150 years a massive shift occurred from agriculture to manufacturing and later to service industries.

Past employment shifts spanned generations, which made adjustment somewhat easier. What historically took several decades is now likely to happen in 15 years.

Employment has shifted massively from agriculture to manufacturing and services as new industries emerged over the past 170 years

Structure of employment in the USA, %, 1850–2015



SOURCE: McKinsey Global Institute: Jobs lost, jobs gained: Workforce transitions in a time of automation

Opportunities and challenges of work automation

LONG-TERM MANAGEMENT OF THE TRANSITION OF THE LABOUR FORCE WILL BE CRUCIAL TO MITIGATE SOCIETAL SHOCKS

To illustrate the potential risk of a “labour market mismatch” caused by automation, we have estimated its potential impact on unemployment. Assuming the fastest adoption scenario for automation technologies available today (i.e., 52% of workforce activities representing 2.4 million jobs automated by 2030), we consider four reemployment scenarios, each assuming that a different percentage of people return to the labour market within a year of their jobs being automated. If only half of the people who lose their jobs to automation manage to find a new job within a year, the unemployment rate may rise temporarily to 13%. If just one in four manage to find a new job within a year – a pessimistic scenario – the unemployment rate may rise temporarily to 24% at its peak. This is consistent with findings for other CEE markets. Even in the middle technology adoption scenario, the equivalent of 1.1 million jobs will be automated by 2030.

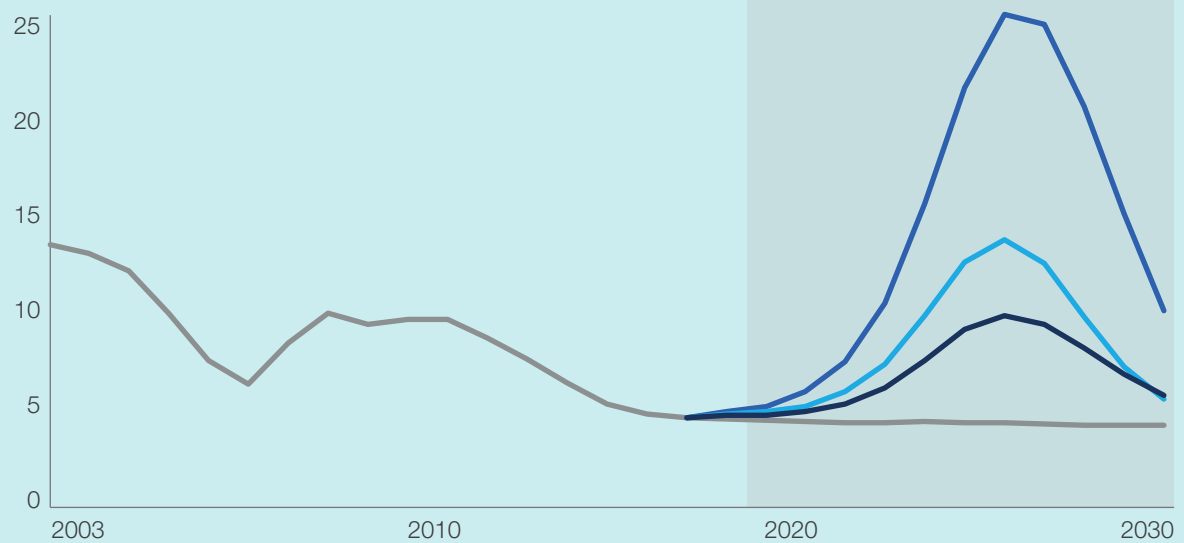
It is therefore crucial for the Czech Republic, along with other countries in the region, to ensure the rapid reskilling of workers to prepare them for those changes and mitigate the risk of spikes in unemployment.



Digitization can help de-bottleneck economic growth in the Czech Republic, however, long-term management of the transition of the labour force will be crucial to mitigate societal shocks

Average unemployment rate of Digital Challengers – fastest adoption scenario
Percentage of labour force

Future scenarios are driven by the share of displaced workers rejoining the workforce within a year



Workforce transition scenarios (share of people returning to work within the first year):

- 25% return
- 50% return
- 66% return
- Baseline: 100% return, 100% transition

SOURCE: McKinsey Global Institute

Opportunities and challenges of work automation

SKILLS SHIFT AND THE POTENTIAL FOR A LABOUR MARKET MISMATCH

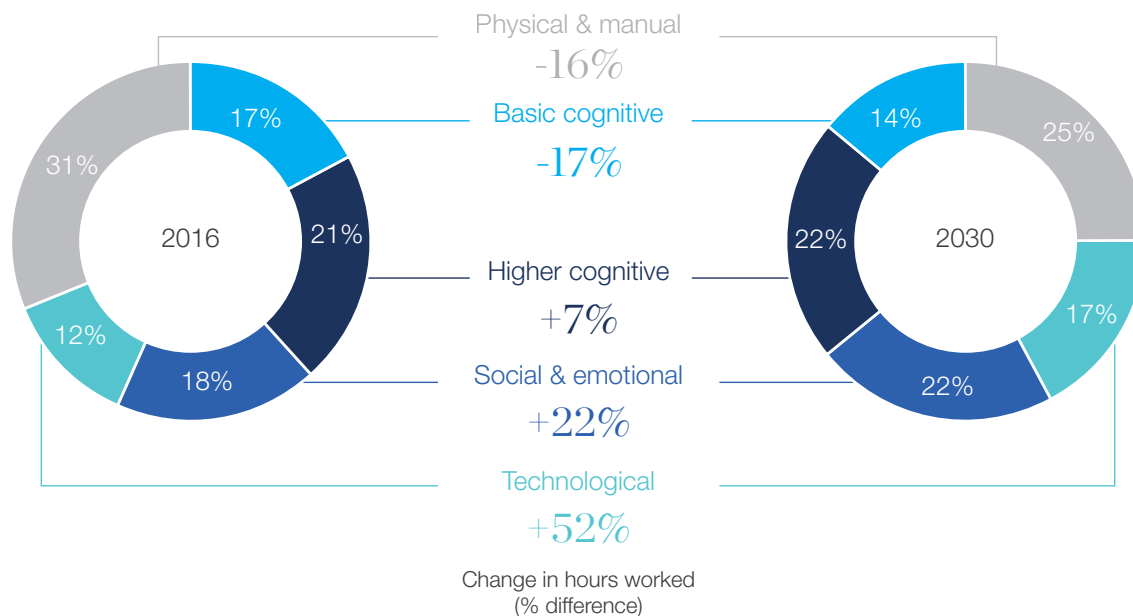
Skill shifts have accompanied the introduction of new technology in the workplace since at least the Industrial Revolution. The adoption of digital technology, automation and artificial intelligence will mark an acceleration over the shifts of even the recent past.

The McKinsey Global Institute has developed a model for the skill shifts that will likely take place in the workplace. Looking at Western European countries, compared to many of which CEE exhibits an even higher automation potential, the strongest growth in demand will occur for technological skills, which constitute the smallest skill category today in terms of hours worked. Demand is expected to rise by around 50% here, representing 17% of hours worked in 2030.

Demand will grow for both basic and advanced technological skills. Occupations requiring advanced technological skills include Big Data scientists, IT professionals, programmers, engineers, technology designers, advanced technology maintenance workers, and scientific researchers. The McKinsey Global Institute model suggests that time spent on these skills will grow rapidly as companies realise their automation potential. Advanced technological skills will be critical for digitizing the economy in the Czech Republic, but people with these skills will still be a minority. At the same time, all employees will need to develop basic digital skills, as workers will be required to use online applications or other technological tools in their day-to-day work.

Demand for technological capabilities could grow by around 50% and for social and emotional skills by around 20%, based on Western European benchmarks

Evolution in skill categories, Western Europe, all sectors, 2016–2030, % of time



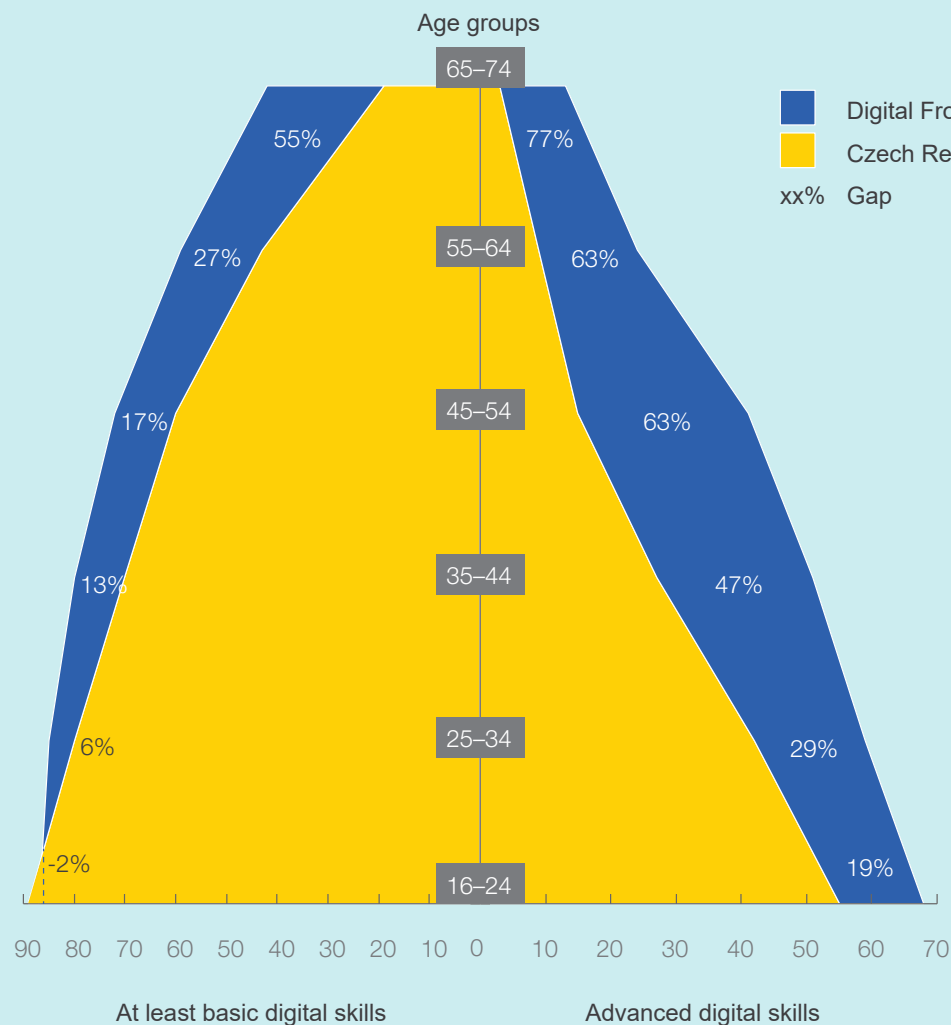
SOURCE: McKinsey Global Institute workforce skills model; McKinsey Global Institute analysis

When looking at the current level of digital skill proficiency in the Czech Republic, we can see a gap compared to citizens in Digital Frontrunner markets. The gap in basic skills is apparent only in older age groups, while the gap in advanced skills exists across the entire population. The older the age group, the bigger the gap. When it comes to advanced skills, particularly worrying is the gap of the 25–54 age group that will determine the productivity of the Czech economy

over the next 10 years. This indicates a strong need for promoting life-long learning among the citizens of the Czech Republic, which we explore in Chapter 3 as a key enabler for digitization in the region. In Chapter 5, we derive a number of implications for policy-makers and companies to promote digital skill adoption in the general population.

The Czech population exhibits lower digital skills than in Digital Frontrunner countries across age groups

Digital skills by age group, share of population, %



Source: Eurostat; McKinsey analysis

Opportunities and challenges of work automation

THE CZECH REPUBLIC'S BIGGEST SECTORS ARE THE ONES WITH THE LARGEST FUTURE LABOUR MARKET MISMATCH

Progressing digitization of the economy will accelerate the demand for people who understand how to work with technology and are able to innovate in the workplace. The need for new digital talent will be particularly great in sectors where the potential for automation is high and the current penetration of technology is low. These industries may experience the biggest “workforce mismatch” in the future.

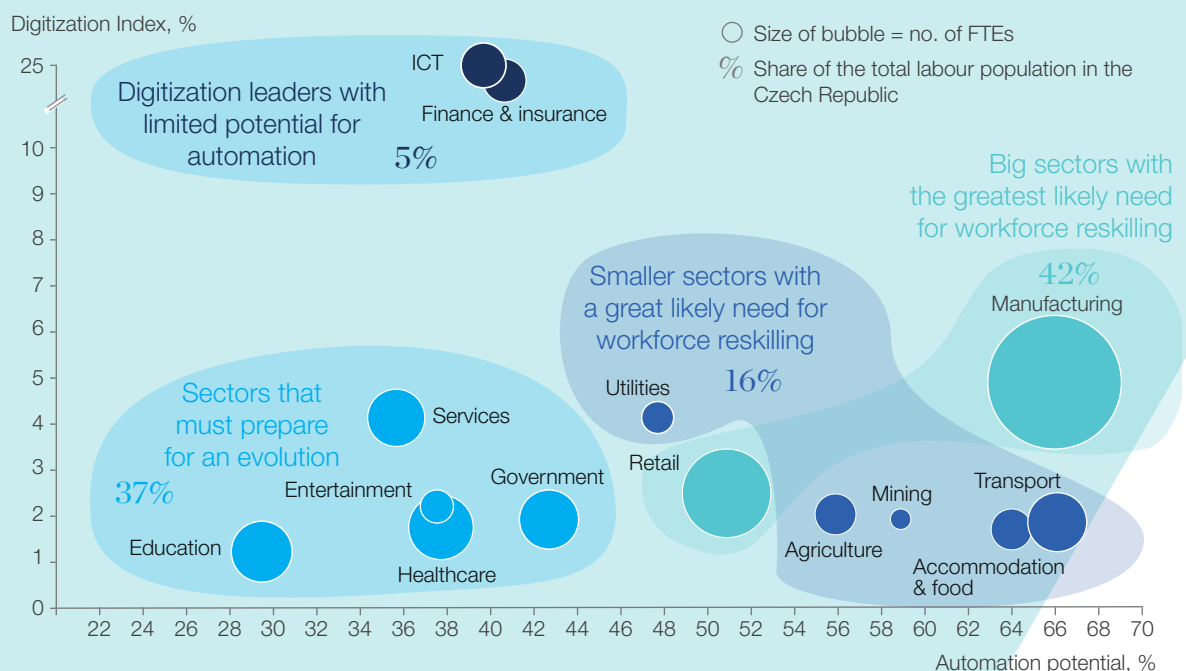
The Czech economy has four groups of sectors with differing needs with regard to digitization:

- **Big sectors with the greatest need for workforce reskilling:** The biggest labour pools in the Czech Republic are in manufacturing and trade. These sectors also have a mismatch, with low current digitization rates and high future automation potential. Given that these sectors are responsible for almost 42% of the labour population in the Czech Republic they are priority for reskilling efforts in the future.
- **Smaller sectors with a great need for reskilling:** Utilities, mining, transportation, agriculture and accommodation are the sectors in the Czech Republic displaying a similar mismatch in terms of low current digitization rates and high future automation potential. While these sectors will also have

to significantly update their skill base, they are significantly smaller in terms of their share in the total labour population.

- **The Czech Republic's most digitized sectors showing relatively lower potential for automation:** Telecommunications and financial and insurance services were the first to undergo digital transformation and are now the leaders of technology adoption in the Czech Republic. They have already started attracting the digital talent they need, and we estimate that their further automation potential is relatively low.
- **Sectors with low digitization and low automation potential must prepare for an evolution:** Sectors such as education, healthcare, and arts and entertainment are not facing a drastic change in the form of automation. Nevertheless, given their low starting point in terms of digitization, they should prepare to adopt more technology and not underestimate the effort required. Since together with the public sector these sectors account for more than 1.1 million people, even comparatively smaller digitization potential represents a substantial opportunity for talent relocation.

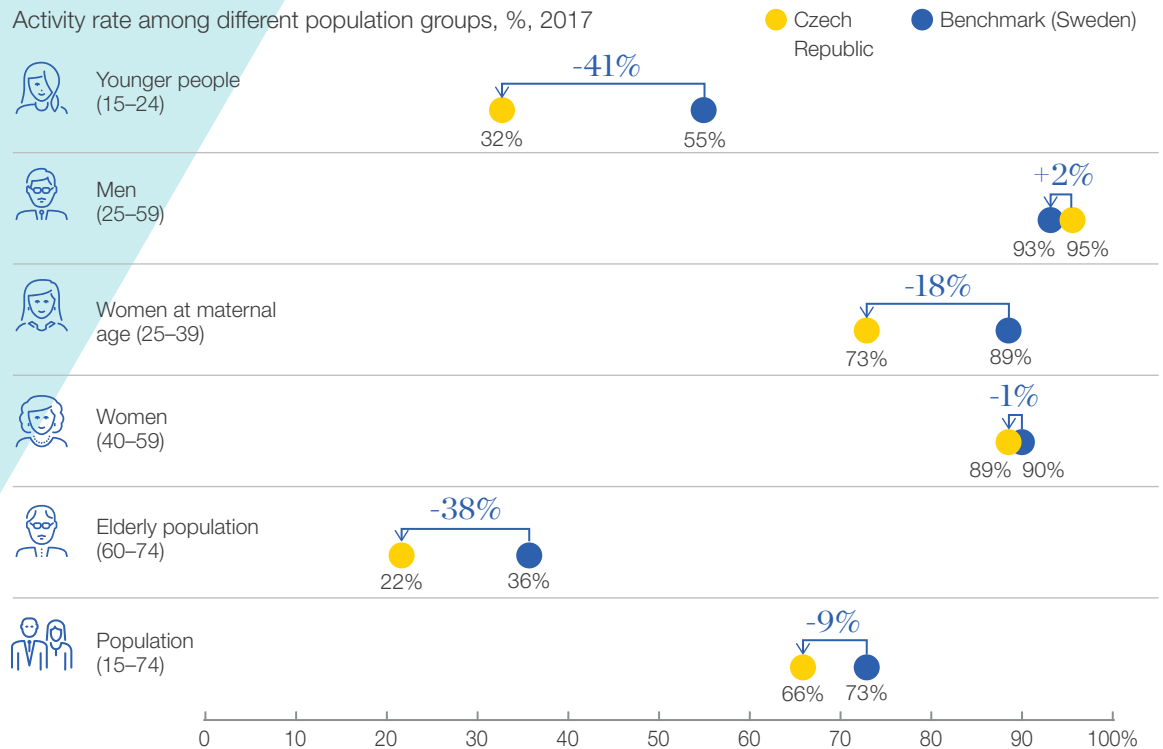
Sectors with low current digitization rates and high automation potential in the Czech Republic are likely to experience the greatest need for workforce reskilling in the future



SOURCE: McKinsey Global Institute; Eurostat; McKinsey analysis

NEW TECHNOLOGY CAN HELP ACTIVATE THE CZECH LABOUR FORCE

Compared to Digital Frontrunner benchmarks, the Czech Republic could have up to 0.7 million people in untapped labour reserves due to lower activity rates

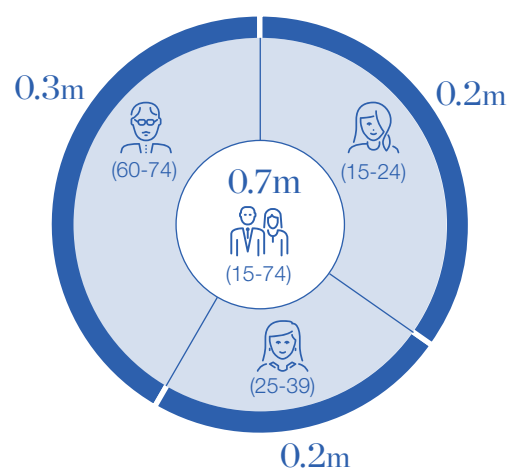


Beyond increasing productivity by automation, technology platforms could also grow employment from the already high base. Despite a high job vacancy rate in the Czech Republic, there are demographic groups with rather low activity levels. Assuming benchmark activity levels of one of the most active labour markets in Europe – Sweden – the Czech Republic has around 0.7 m people in untapped labour reserves. In the whole population of the Czech Republic there are 9% fewer active people than in Sweden. The highest gap can be observed among young (41%) and elderly (38%) people. The participation of middle-aged and maternal-aged women also falls short by 18%.

We see multiple ways how digitization can increase the activity rates in the Czech Republic and the wider CEE region:

- Support new marketplaces for independent work, which empower people to find flexible employment
- Reskill people for technology jobs, e.g., non-profit organisation Czechitas which organises IT courses for women
- Support platforms for young people to solve business problems and pursue internship programmes. ■

Czech labour reserves compared to the activity rate of Sweden, million people, 2017



NOTE: Activity rate = share of the population, both employed and unemployed, that constitutes the manpower supply of the labour market
SOURCE: Eurostat, McKinsey analysis

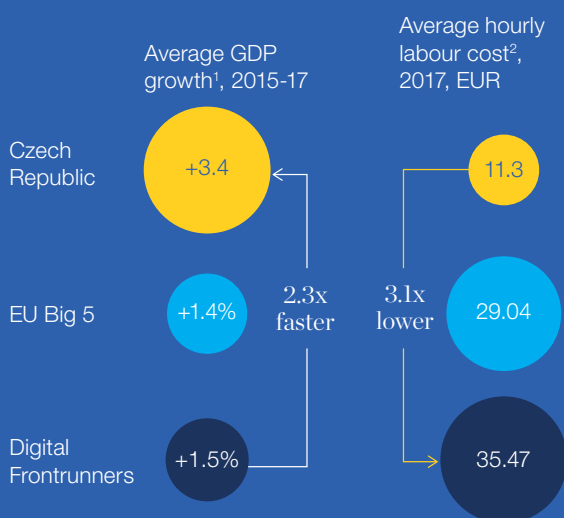
Key foundations for the Czech Republic's Digital Challenger status

The digitization of a country or region is ultimately the outcome of many processes and factors. Here we look at key areas of importance for digital transformation and identify which of these should be prioritised for action by the Czech Republic. Our investigation covers all dimensions, from talent and innovation to infrastructure and governance. For each of these dimensions, we have tested multiple hypotheses, looking at the experience of Digital Frontrunners and comparing it with the performance of Digital Challengers and the Czech Republic. By calculating scores for KPIs in these areas and combining this data with qualitative assessments by experts, we are able to identify areas where the Czech Republic already performs close to or on a par with Digital Frontrunners – these areas can be thought of as the foundation for growing the digital economy further in the country.

FOUR STRENGTHS FOR FURTHER DIGITIZATION IN THE CZECH REPUBLIC

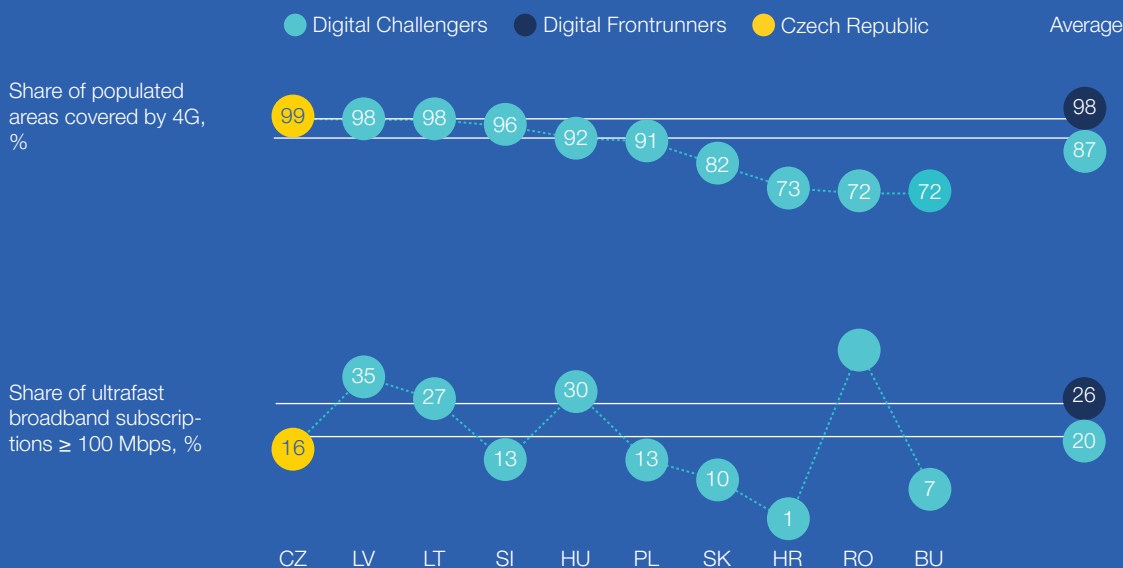
A Competitive advantages at a macroeconomic level

The Czech Republic offers high-growth economy with relatively low labour costs



SOURCE: World Bank; Eurostat

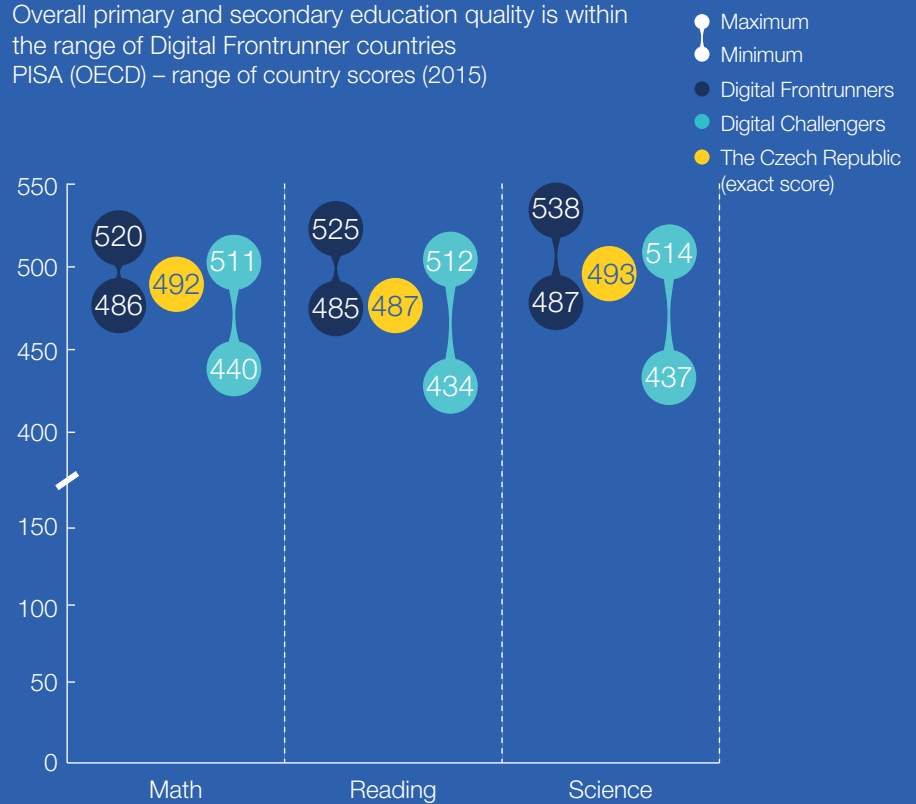
B Good overall digital infrastructure coverage, though ultrafast broadband take-up is still low



SOURCE: DESI 2018

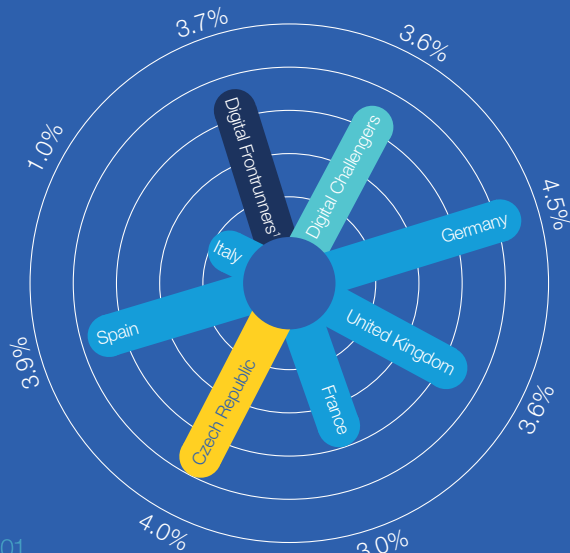
C A good primary and secondary education foundation despite a declining trend

Overall primary and secondary education quality is within the range of Digital Frontrunner countries
PISA (OECD) – range of country scores (2015)



D A large and high-quality graduate talent pool in the areas of ICT (information and communication technology) and STEM (science, technology, engineering and mathematics)

The Czech Republic boasts a higher share of ICT graduates among the student population compared to both the CEE and Digital Frontrunner average, %, 2016



NOTE: For the Netherlands, data taken from 2015
SOURCE: Eurostat

E An already emerging, vibrant digital ecosystem (selected areas)

EXAMPLES OF CZECH DIGITAL CHAMPIONS

There are many digital success stories of Czech companies leveraging the digital economy to achieve scale and revolutionise their industries. Avast built a leading position in the global security software market. The 2018 listing on the LSE valued Avast at GBP 2.4 billion. The travel agency Kiwi is among the EU's fastest growing companies and 90% of their traffic is coming from abroad. Air Bank has built a digital attacker bank that within seven years profitably acquired nearly 10% of the banked population.

CZECH INCUMBENTS ADOPTING DIGITAL

Large incumbents from more traditional industries are also following suit. Ceska sporitelna, the largest bank in the country, has embarked on an ambitious digitization of its business. It recently switched off its traditional internet banking and migrated all customers to a modern platform called George.

Key enablers for further digitization in the Czech Republic

Several areas remain where the Czech Republic has to make improvements in order to fully tap its digital potential. We identify multiple “key enablers” for digitization where closing the gap to Digital Frontrunners would have a major positive impact on the digital economy of the Czech Republic, along four dimensions:

- Talent – including stimulating the growth of the ICT specialist population as well as life-long learning among Czech employees
- Soft infrastructure – including the adoption of digital tools and skills among the Czech general population, Czech-based enterprises and the public sector
- Innovation – in the form of fostering the country’s entrepreneurship culture
- Legal, political and business environment



1 DIGITIZATION ENABLER

Increase the adoption of digital skills and take-up of internet services by the Czech general population

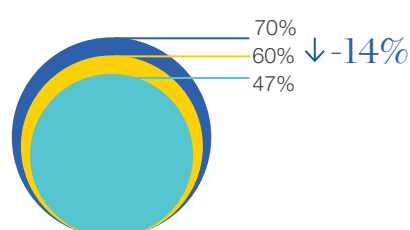
We consider the widespread adoption of digital skills among the general population a key enabler for digitization in the Czech Republic. In terms of basic digital skills, the Czech population performs rather well – ahead of the Digital Challengers and only slightly behind Digital Frontrunners. However, there is a substantial gap in advanced digital skills that the Czech Republic needs to close.

DIGITAL TOOLS AND SKILLS PERSPECTIVE

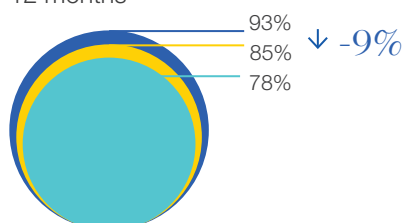
Basic digital skills

% of population aged 16–74 (2017) ...

... with at least basic digital skills

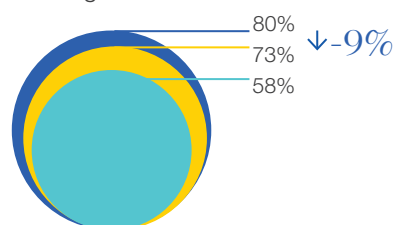


... using the Internet in the last 12 months

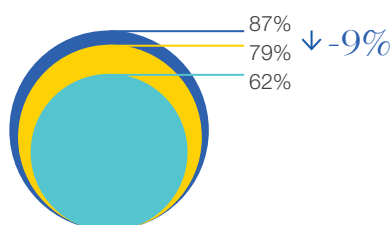


In basic digital skills, the Czech population is ahead of the Digital Challengers and the gap to the Digital Frontrunners is rather small.

... looking online for information about goods and services



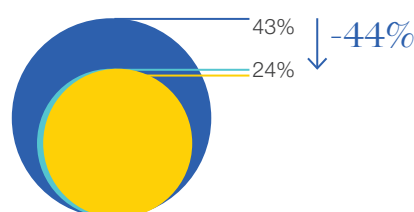
... sending/receiving email



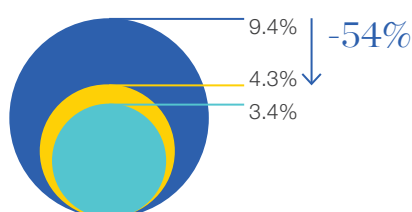
Advanced digital skills

% of population aged 16–74 (2017) ...

... with above basic digital skills

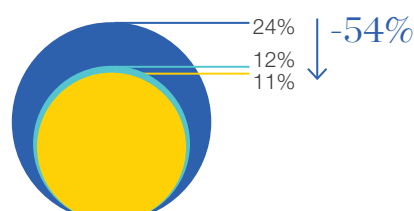


... who have written a computer program

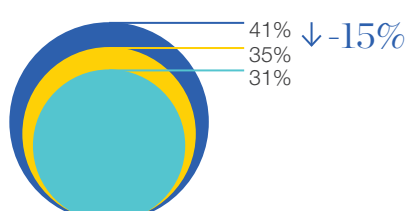


The Czech population lags dramatically in terms of advanced digital skills and the gap to the Digital Frontrunners stands around 50%.

... selling goods or services online



... have uploaded self-created content to any website to be shared



SOURCE: Eurostat; Digital Economy and Society Index, 2017

① DIGITIZATION ENABLER

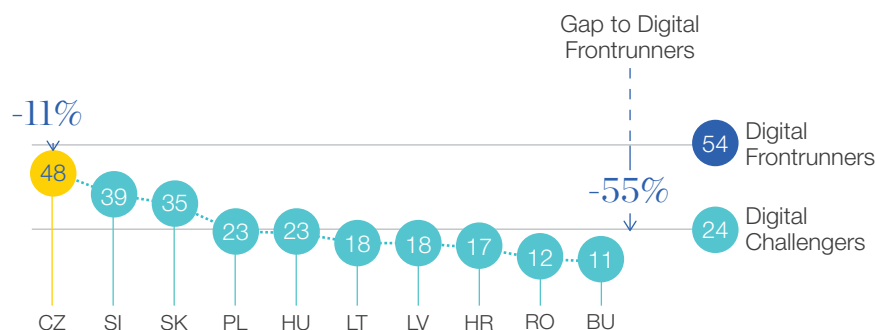
Increase the adoption of digital skills and take-up of internet services by the Czech general population

Take-up of internet services is also clearly lower in the Czech Republic compared to Digital Frontrunners – closing this gap in terms of demand and supply of products and services available online will be an important driver for the growth of e-commerce in the region. It appears the gap is driven by three aspects which all need improvement: Lower digital skills, particularly among the older population, constrain e.g., online banking. Limited employer attention to online marketing affects e.g., professional networks. Finally, low availability of user-friendly solutions limits the take-up of e.g., digital healthcare.

TAKE-UP OF INTERNET SERVICES PERSPECTIVE

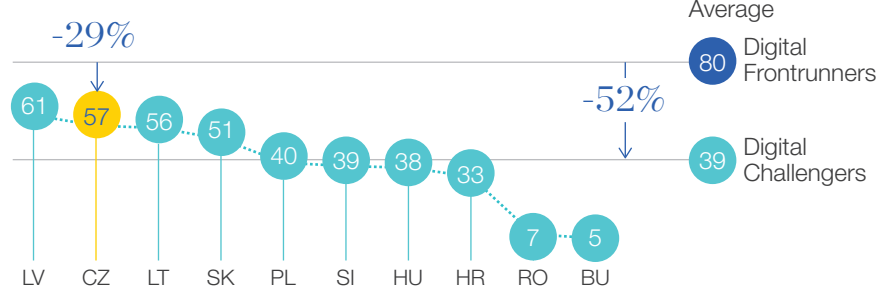
% of population aged 16–74 (2017) ...

... who have used online travel and accommodation services



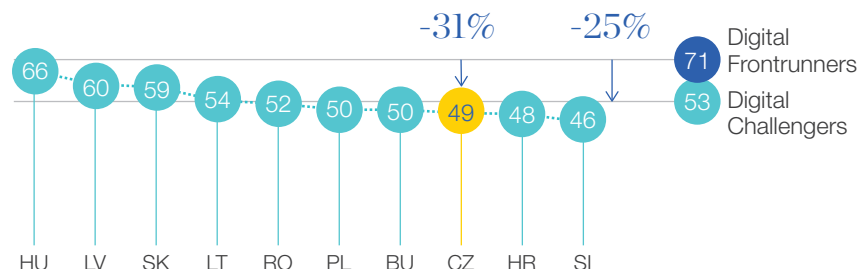
Relatively low gap (-11%) to Digital Frontrunners due to the availability of simple solutions with user-friendly interfaces.

... who have used online banking



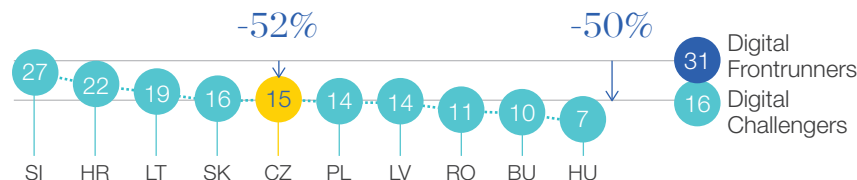
Substantial gap (-29%) to Digital Frontrunners is driven mainly by the lower digital skills of the older population.

... participating in online social or professional networks



Substantial gap (-31%) to Digital Frontrunners and (-4%) to Digital Challengers caused by lower attention to online networks.

... who have used health and care services provided online



Major gap (-52%) to Digital Frontrunners due to unavailability of user-friendly digital solutions in this area.

SOURCE: Eurostat; Digital Economy and Society Index, 2017

Leverage and grow the Czech ICT specialist labour pool

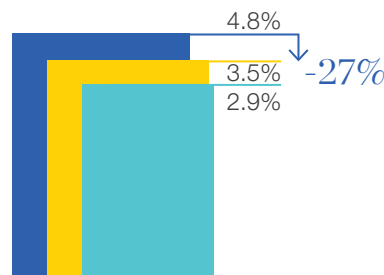
Having a large pool of information and communications technology (ICT) specialists enables the digitization of both private and public sectors. ICT specialists are the driving force behind the digitization and automation of back-end processes, developing next-generation customer experience solutions and building data-driven insights. Developers and engineers who are up to date with the latest technology trends also form the technological and creative backbone of startups.

The Czech Republic can benefit from the leading share of ICT specialists in its younger population. For example it can encourage companies to set IT and service hubs (similar to the approach adopted by Poland) and match talent to business problems by, e.g., hackathons, competitions or school projects co-organised by universities and businesses. The ICT talent can be even more valuable to companies if universities encourage ICT students to take business-oriented elective courses, e.g., business and foreign languages, and participate in international exchange programmes.

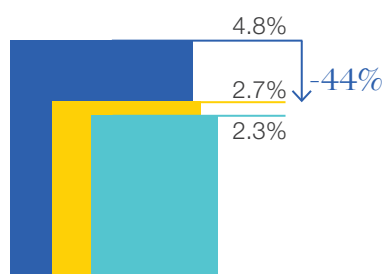
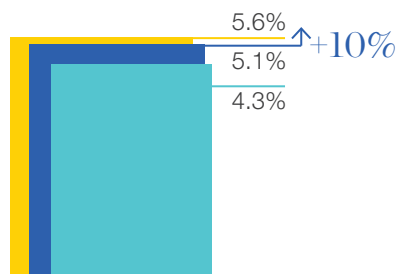
SHARE OF ICT SPECIALISTS

Percentage of employed population, 2016

- Digital Frontrunners (avg.)
- Digital Challengers (avg.)
- Czech Republic



The Czech Republic is ahead of the Digital Challengers in terms of the share of the population employed in the ICT sector, but lags behind Digital Frontrunners.



While the Czech Republic is ahead of the Digital Challengers in the younger population, a significant underrepresentation of ICT specialists in the older population presents a major challenge.

SOURCE: Eurostat; Digital Economy and Society Index, 2017; UNESCO Institute for Statistics

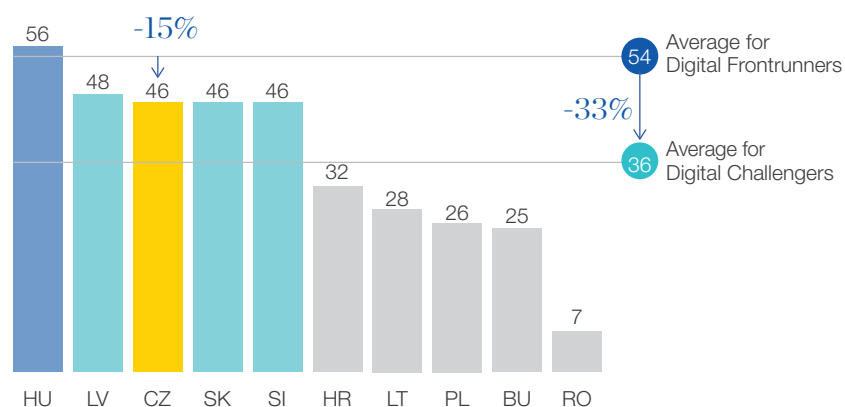
Increase the provision of trainings to develop/upgrade digital skills of employees by Czech enterprises

With the progressive adoption of automation technologies, most industries will experience a growing shift in their demand for skills in the Czech Republic. Higher cognitive, social and emotional skills as well as technological skills are the categories which will grow in importance. The labour market will have to adjust to meet this demand. In this context, national reskilling strategies, including the promotion of life-long learning and formal employee training provision by companies, will be key.

- Outliers above Digital Frontrunners average
- Markets close to Digital Challengers average
- Outliers below Digital Challengers average
- Czech Republic

ADULT PARTICIPATION RATE IN EDUCATION AND TRAINING IN THE LAST 12 MONTHS

Percentage of 25–64 years old, 2016

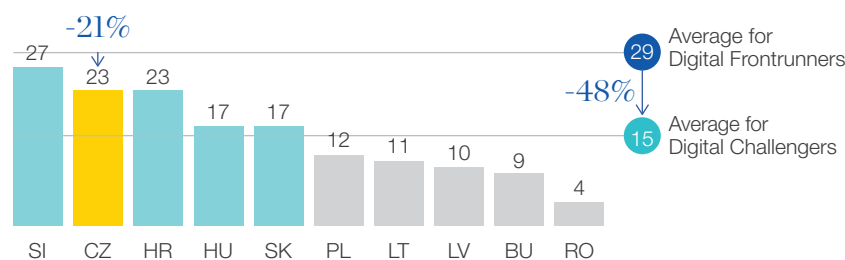


The degree to which the population in the Czech Republic embraces training for adults is above the CEE average.

However, with the exception of Hungary, all Digital Challengers have lower participation rates than Digital Frontrunners.

FIRMS PROVIDING TRAINING TO DEVELOP EMPLOYEES' ICT SKILLS

Percentage of firms, 2017



On average, a clearly smaller share of enterprises in CEE provides training for employees in developing their ICT skills. While the Czech Republic is a positive outlier above the CEE average in this respect, room for improvement remains when looking at Digital Frontrunner markets

SOURCE: Eurostat; Digital Economy and Society Index, 2017

Increase the adoption of digital tools by Czech small, medium, and large enterprises

With the help of digital tools, businesses can enhance their performance through boosting their revenue growth capabilities, as well as increasing their efficiency through better resource allocation. We look at five dimensions for companies to achieve such benefits, benchmarking the Czech Republic against Digital Challengers as well as Digital Frontrunners.

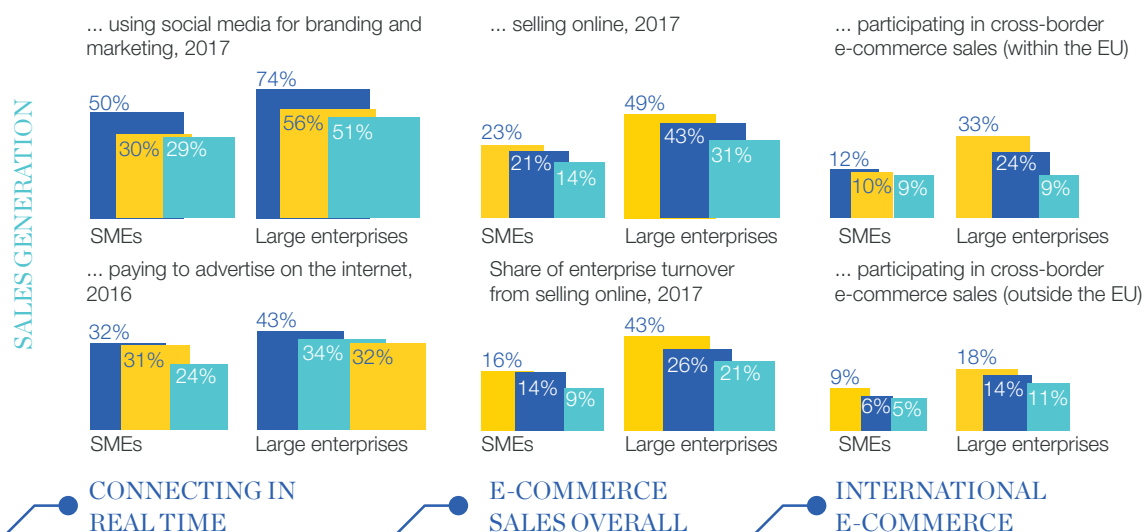
REGIONAL AVERAGES

Share of companies...

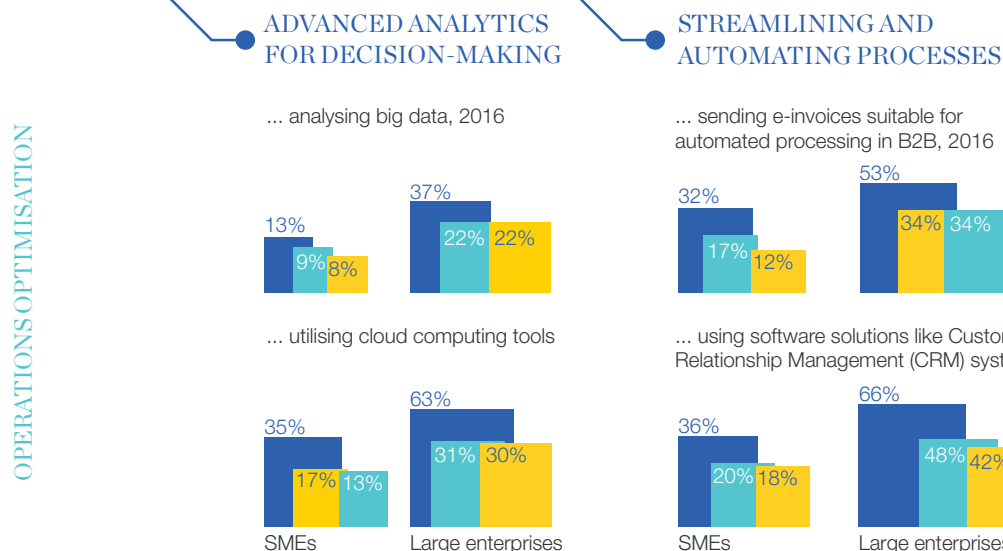
Digital Frontrunners (avg.)

Digital Challengers (avg.)

Czech Republic



Digital tool adoption – proxy metrics



Czech enterprises of all sizes have embraced selling online. The share of enterprise turnover from selling online is significantly above that of Digital Frontrunners. Czech enterprises also are relatively more inclined to use online channels for cross-border sales. However, Czech enterprises still lag behind Digital Frontrunners in using digital tools to connect with customers - looking at the use of social media for branding and marketing and paying for internet advertising.

Gaps can also be seen in proxy metrics measuring the degree to which businesses streamline and automate their processes in the Czech Republic.

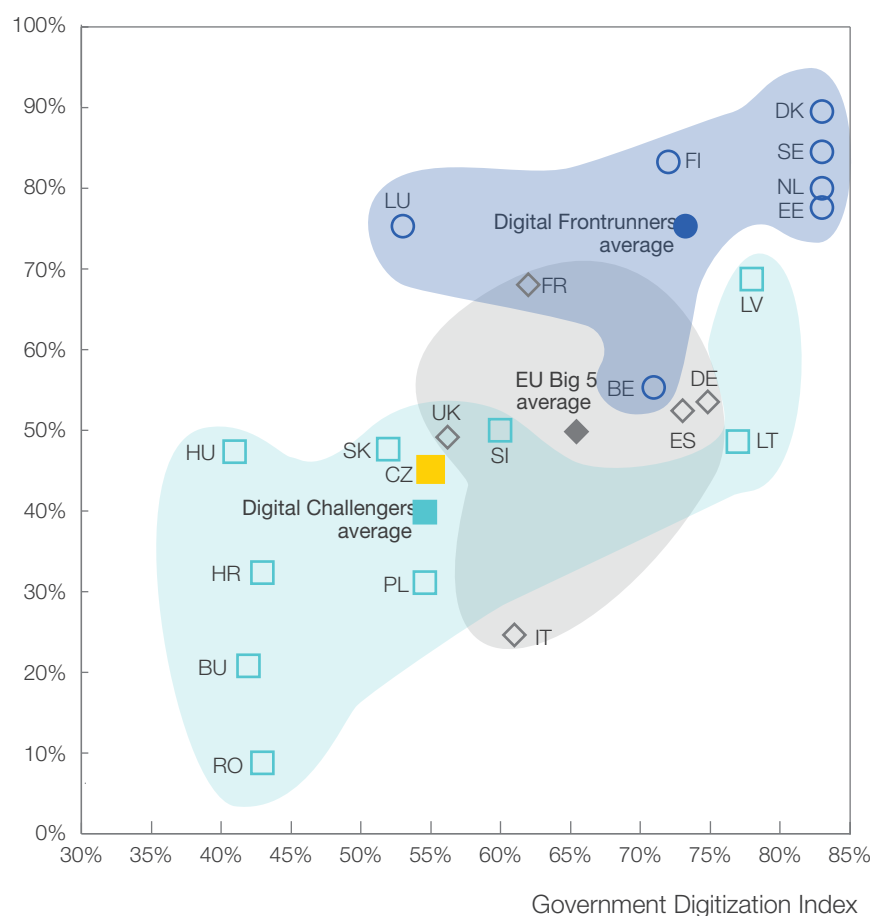
Finally, a significantly smaller share of both SMEs and large enterprises in the Czech Republic leverage digital solutions for analysing big data.

Develop, implement and promote e-government solutions in Czech public sectors

Digitizing public services has various benefits for citizens, businesses and the government itself. Digital government services can significantly reduce the administrative burden on citizens and firms. It also increases transparency about decisions and thus reduces the risk of corruption. Finally, it is able to deliver its services in more cost-effective way.

E-GOVERNMENT PENETRATION & UPTAKE

Individuals accessing public services online, percentage of individuals aged 16–74

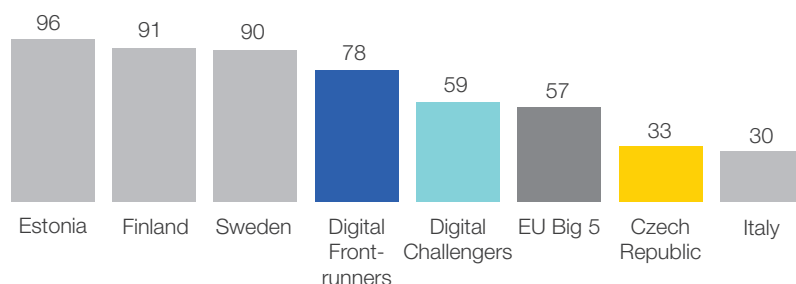


On average, Digital Frontrunners lead the way in both penetration of digitization in the public sector and uptake of public digital services by society. More than 80% of the population in these countries access public services online.

Among Digital Challengers, the Czech Republic is above average in terms of both government digitization and uptake of online public services.

E-GOVERNMENT ACTIVE USAGE

Percentage of individuals sending filled forms to public authorities



However, low user-friendliness and lack of integration between online government services is a major obstacle for e-government. As a result, the Czech Republic is second to last in the EU in terms of active usage of e-government.

SOURCE: Eurostat; Digital Economy and Society Index, 2017

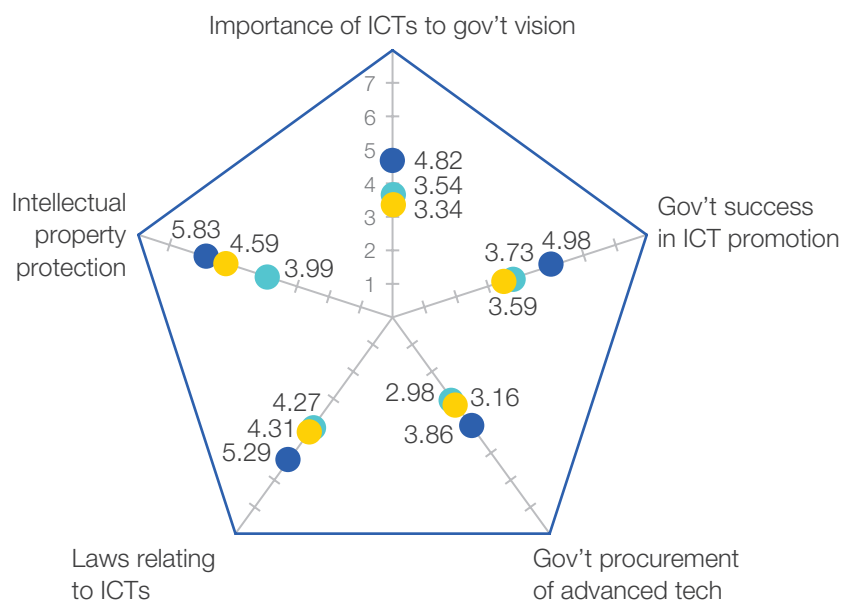
Improve & standardise the Czech business environment to ensure investment attractiveness

Digitization interacts with other formal and informal institutional factors and jointly they determine the attractiveness of the country for investment. The ability of countries to enforce contracts, ensure data privacy and pro-ICT regulations will grow in importance. Robust intellectual property rights (IP) protection will be especially important, since technology patents often represent a large portion of assets for technology enterprises, a source of their competitive strength.

■ Digital Frontrunners (avg.) ■ Digital Challengers (avg.) ■ Czech Republic

WORLD ECONOMIC FORUM NETWORK READINESS INDEX

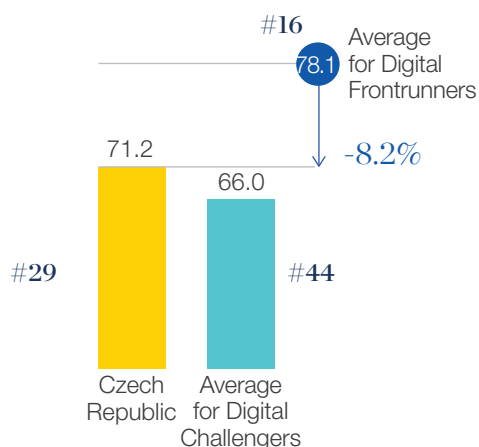
Synthetic score, 1-7 (best)



The Czech Republic lags behind Digital Frontrunners on all aspects of friendliness of the regulatory regime towards ICT. The gap is smallest in terms of protection of intellectual property, where the Czech Republic outperforms the other Digital Challengers. However, in terms of importance of ICT to government vision and government success in ICT promotion, the Czech Republic lags behind not only the Digital Frontrunners, but also the Digital Challengers.

WORLD ECONOMIC FORUM GLOBAL COMPETITIVENESS INDEX

Score and rank among 140 countries



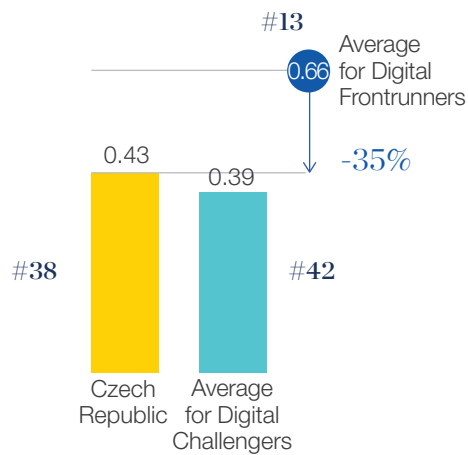
The Czech Republic has improved in the Global Competitiveness Index and now ranks #29 among 140 countries. It is clearly ahead of the Digital Challengers, who on average rank #44, but lags both behind the Digital Frontrunners (average rank #16) and the EU Big 5 (average rank of #17). However, the generally good ranking hides long-term neglected areas, for which the Czech Republic is among the worst third: Internal labour mobility #137, labour tax rate #134, ease of hiring foreign labour #126, ease of finding skilled employees #125, distortive effect of taxes and subsidies on competition #124, burden of government regulations #116, complexity of tariffs #112, hiring and firing practices #107, buyer sophistication #103, future orientation of the government #101 and efficiency of legal framework in challenging regulations #96.

Foster entrepreneurship in the Czech Republic to stimulate the startup ecosystem

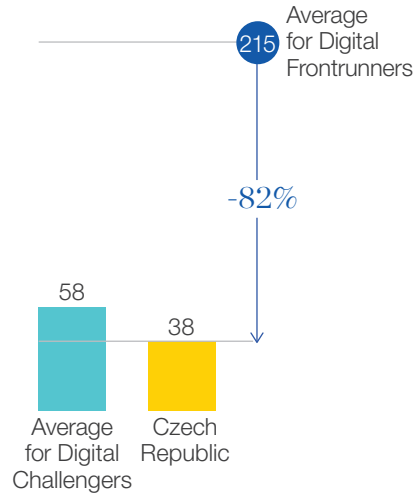
The state of the ecosystem for startups is an important enabler of accelerated digitization. The Czech Republic comes out relatively poorly in comparison with both Digital Frontrunners and, on many indicators, Digital Challengers.

EARLY-STAGE STARTUPS

Global Entrepreneurship index



Number of startups per million citizens, 2018

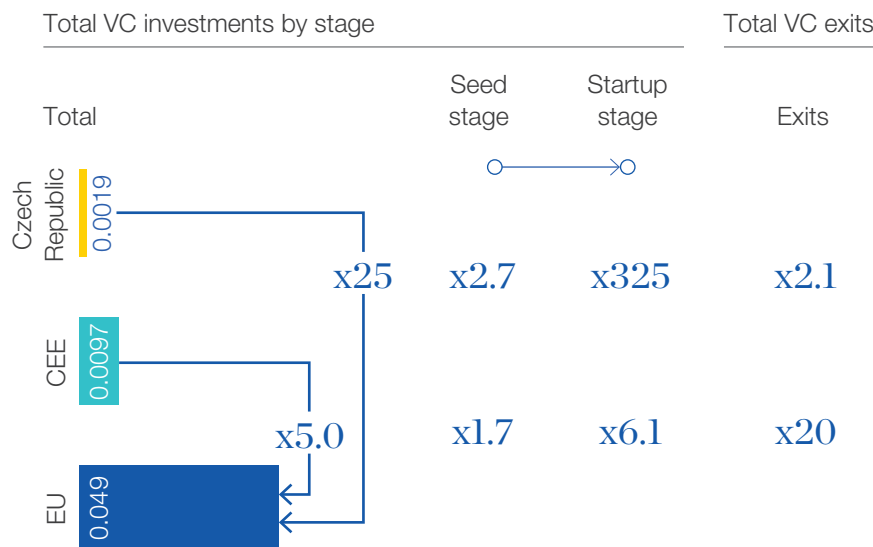


The Czech Republic ranks #38 in the Global Entrepreneurship Index, slightly ahead of Digital Challengers and with a 35% gap to Digital Frontrunners. However, the Czech performance is mixed with some great aspects (e.g., internationalisation 100% and product innovation 85%) and very poor performance in few important areas (e.g., cultural support 9%).

The deficient entrepreneurship environment contributes to the number of startups in the Czech Republic per million citizens trails that of Digital Challengers by 35% and Digital Frontrunners by 82%.

STARTUP FUNDING IN CEE, 2017

Gap in VC investment and VC exits as share of GDP



Similarly, Venture Capital funding in the Czech Republic measured as share of GDP lags behind the EU average by a factor of 25 and is lower than CEE average too.

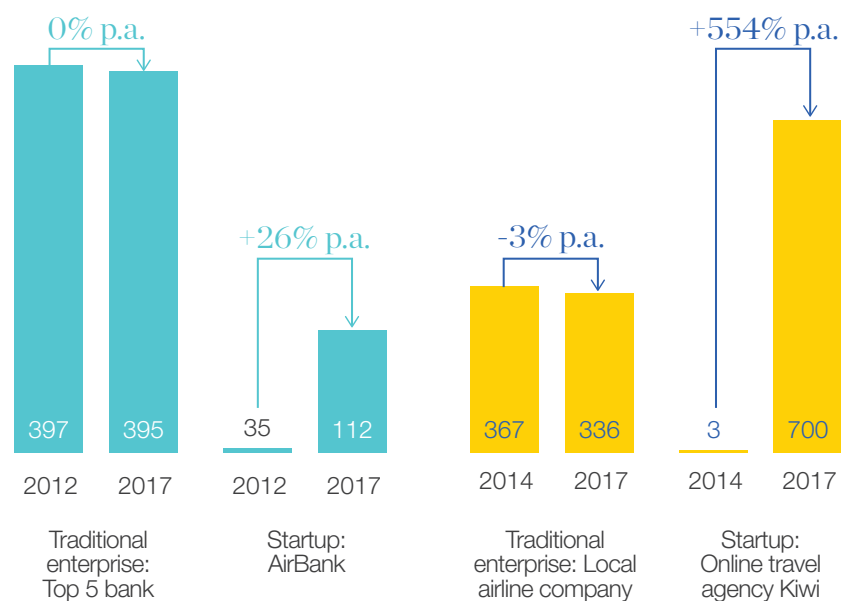
SOURCE: Eurostat, Global Entrepreneurship and Development Institute, Funderbeam, Dealroom, Angel.co, Invest Europe, Pitchbook

ANALYSIS: WHAT IS THE IMPACT OF STARTUPS ON THE ECONOMY

Startups contribute to the economy in three ways: they increase innovation, lead to the development of large-scale enterprises and create jobs. Innovation is a major long-term driver of economic growth.¹ For historical reasons, Digital Challengers have fewer large-scale private enterprises than Digital Frontrunners. However, this gap is closing thanks to digitization.

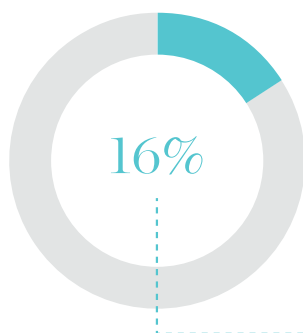
STARTUPS VS. TRADITIONAL FIRMS

Annual revenue, EUR million

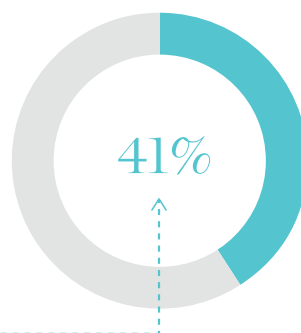


Czech startups successfully challenge traditional businesses across all sectors. Startups have the strongest advantage when expanding to international markets. European startups on average generate 55% of their revenue outside their domestic markets. Digitization allows startups to replicate digital assets and communicate globally. Although only 34 of the 1,000 fastest-growing firms in Europe are from Digital Challenger countries, 90% of them are digital natives.

SHARE OF YOUNG SME IN TOTAL EMPLOYMENT



SHARE OF YOUNG SME IN NEW JOB CREATION



Young small and medium-sized enterprises (SMEs) contribute disproportionately to job creation: Across 17 OECD countries they account for 16% of overall employment but create 40% of new jobs.⁵ Additionally, creating one high-tech job can lead to the creation of more than four additional non-high-tech jobs in the same region.

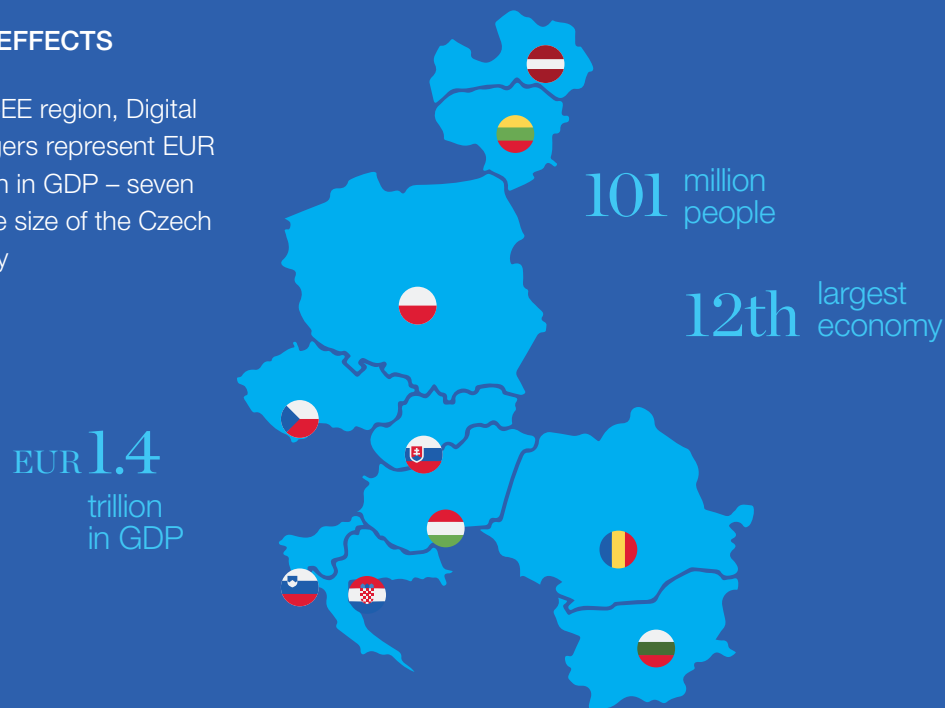
NOTE: Young SMEs: companies with less than 250 employees and operating for no longer than 5 years

SOURCE: European Startup Monitor, European Commission, Financial Times

Four arguments for the benefit of collaboration between Digital Challengers

(A) SCALE EFFECTS

As the CEE region, Digital Challengers represent EUR 1.4 trillion in GDP – seven times the size of the Czech economy

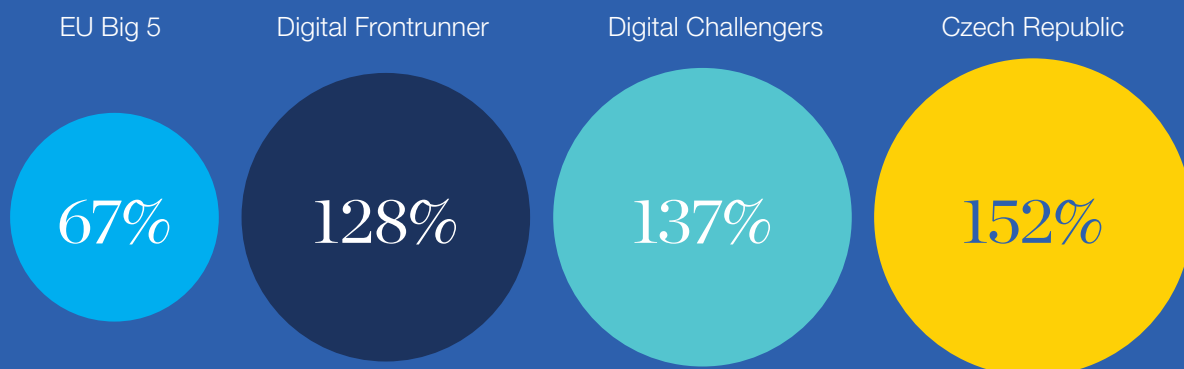


SOURCE: World Bank

(B) SIMILAR STARTING POINTS

The Czech Republic, like other CEE markets, exhibits high levels of market openness and similar levels of digitization, in addition to cultural and historic commonalities.

Trade (% of GDP), 2017



NOTE: Without Luxembourg (strong outlier with a score of 424%)

SOURCE: World Bank

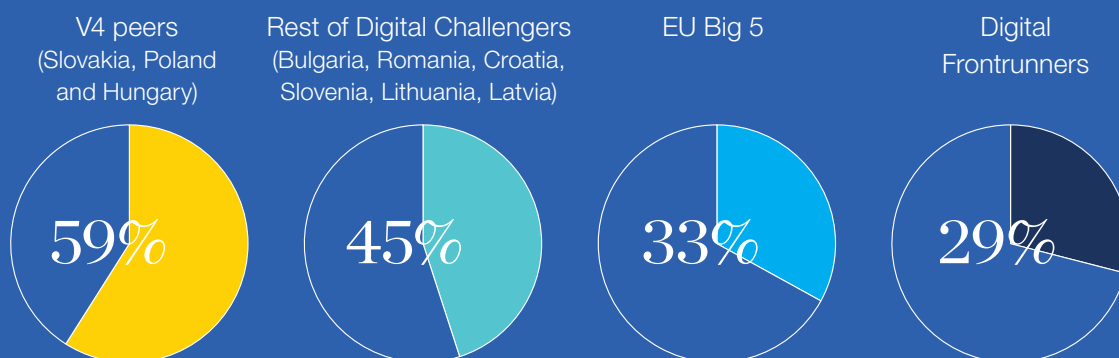
© COMMON CHALLENGES

The Czech Republic faces many of the same challenges as the other CEE markets. For example, the ranking of the Czech Republic along the individual factors of the Global Competitiveness Index are well correlated to those of the other V4 countries and also to the rest of the Digital Challengers. The correlations with the EU Big 5 and the Digital Challengers are much lower.

The Czech Republic, similarly to the other Digital Challengers, needs to make biggest improvements in its business environment, education and digitization of the public sector.

Components of the WEF Global Competitiveness Index – correlation between the Czech Republic and other markets

%, 2018



© BEST PRACTICES

The Czech Republic has developed different strengths related to the digital economy compared to other CEE markets – sharing best practices can accelerate digitization across the region.

Looking at the various KPIs and case studies we have explored in our CEE report “Rise of Digital Challengers: Digitization as the next growth engine for Central and Eastern Europe”, we see that no single Digital Challenger market outperforms the other countries across all digitization areas. Markets in the region appear to have digitized differently, developing advantages in certain fields. For instance, we already saw that the Czech Republic exhibits digitization rates above the CEE average in several sectors, most notably in financial services and manufacturing. Also, in many digitization enabling areas the Czech Republic outperforms its CEE peers, e.g., adoption of digital skills among individuals, adoption of digital tools among enterprises and participation rates in adult learning among the general population. On the other hand, Czechs could benefit from developing a startup ecosystem at least on the level of that in other CEE countries. Such sharing of best practices among CEE countries could be very beneficial.

Encouraging regional coordination and planning could speed up the development of the digital economy by replicating successful strategies already tested elsewhere. See also our CEE Digital Challengers report for multiple success stories on stimulating the digital economy across the CEE region.

In the future, Czechs and other Digital Challenger nations could work together on digital projects and policy solutions across the region. Also, a pan-CEE coalition could help ensure that the digital interests of the region's countries are heard at the European level.



Talent

Build skill sets for the future

KEY FACTS ABOUT THE CZECH REPUBLIC

Large future need for workforce reskilling in the Czech Republic: up to 52% of workplace activities could potentially be automated using technology that already exists. In a middle adoption scenario, 1.1 million jobs would be automated in the Czech Republic by 2030.

The Czech general population lags behind Digital Frontrunners in basic and advanced digital skills – the older the age group, the bigger the gap.

Despite a large STEM graduate talent pool, the share of ICT specialists in the Czech labour force (3.5%) is less than the Digital Frontrunner average of 4.8%.

The adult participation rate in training in the Czech Republic (46% of people aged 25–64), is higher than in CEE (36%), but trails the Digital Frontrunners (54%).

Implications for policy-makers

Develop a wide-ranging reskilling strategy

Diagnose the state of the current workforce and forecast the necessary shift in skill sets for the future, e.g., develop a labour market model, identify sector shifts, understand the gap between current and future skills.

Search for relevant solutions and benchmarks, e.g., look at the experiences of other markets such as Denmark, Canada, Singapore.

Commit to the programme and measure the effectiveness of actions, e.g., measure changes in employment rates and wages, hold educators responsible for the outcomes of reskilling programmes.

Update youth education

Ensure standard digital infrastructure, integrate digital tools and resources in schools (e.g., online courses, virtual reality, gamification) and equip teachers with the necessary skills.

Update the curricula of pre-university schools, e.g., increase focus on skills such as programming, entrepreneurship and initiative-taking, leadership and managing others, communication skills.

Promote specialisation in STEM subjects to build an ICT talent base, focusing especially on enabling women to study technology to close the gender gap.

Cooperate with the private sector to create practical education programmes and support apprenticeships.

Promote life-long learning and mid-career training

Create an ecosystem that helps adults reskill and upskill: build motivation to learn among adults, offer practical training and/or incentives, provide support during the transition period and assist in job-seeking.

Support new types of education credentials, e.g., digital programmes.

Increase accessibility of education by improving people's English-language skills, enabling them to access global knowledge resources.

Promote talent acquisition

Attract additional ICT specialists from around the globe, e.g., work with the private sector to determine the demand for highly skilled workers and simplify the migration process for such individuals.

Keep ICT specialists from leaving the country, e.g., encourage universities to collaborate with the private sector to provide high-quality internships as part of degree programmes or immediately after graduation.

Attract ICT specialists who have left back to the country, e.g., provide scholarships for young people studying abroad in exchange for a commitment to come back and work in the home country.

Leverage independent work platforms

Carry out research to understand the size and growth of the gig and independent work economy.

Consider updating policies supporting the gig economy and worker protection initiatives.



Soft
infrastructure

Support technology adoption

KEY FACTS ABOUT THE CZECH REPUBLIC

The Czech Republic trails the Digital Frontrunner average in the European Commission's Government Digitization Index which, among others, measures the availability of key e-government solutions, such as electronic identification (eID), digital documentation, electronic authentication sources and digital post in communication with citizens and businesses.

At the same time, take-up of e-government services is low – with less than 50% of citizens aged 16–74 accessing public services online, compared with 75% of Digital Frontrunner citizens. Active e-government usage is even lower as only 34% of Czechs with internet who need to submit government forms do so online.

The adoption of digital tools and skills by companies in the Czech Republic is lower than that of Digital Frontrunners. Around 22% of companies in the Czech Republic exhibit a very high or high adoption rate for digital tools, above the CEE average of 16% but below the Digital Frontrunner average of 35%.

Implications for policy-makers

Digitize the public sector

Ensure strong support from the government to drive digitization, e.g., empower the recently created National Agency for ICT (“NAKIT”) to better tackle regulatory barriers to new business models and stimulate growth of the digital economy.

Speed up the development of user-friendly online public services, e.g., promote integrated online public service platforms and online signatures.

Support online public services, e.g., launch educational campaigns, promote online solutions during offline interactions, decrease adoption barriers by creating simple user interfaces.

Develop digital skills among public-sector employees.

Digitize back-end government processes focusing on the most labour-intensive and expensive processes first and free up talent for redeployment towards value added tasks and other sectors.

Unleash Big Data capabilities by standardising government data and services, opening them up to third-party collaborators (researchers, businesses, startups, etc.) so they can build applications on top of it.

Invest in Internet of Things (IoT) infrastructure in the public sector, e.g., support smart city and human health solutions strongly leveraging public data and resources.

Support technology adoption at companies

Promote the benefits of digital transformation, focusing on SMEs and major sectors that lag behind.

Create incentives for companies, especially SMEs, to use digital tools, e.g., make business-to-government interactions digital by default.

Leverage external funding, e.g., from the EU, to finance the most promising initiatives supporting the development of the digital economy.



Innovation

Improve the ecosystem for startups

KEY FACTS ABOUT THE CZECH REPUBLIC

- Whilst the Czech Republic exhibits higher entrepreneurship levels compared to the CEE average (see Chapter 3), it is still trailing Digital Frontrunner markets.
- The number of startups per million citizens in the Czech Republic, at 38, is less than the average of 58 for the CEE region – and much less than the Digital Frontrunner average of 215.
- Venture Capital investments as a share of GDP are 25 times lower in the Czech Republic compared to the EU average and five times lower than the CEE average.

Implications for policy-makers

Improve the entrepreneurial talent pool

- Embed entrepreneurship in formal education, especially in STEM subjects.
- Link entrepreneurial education to startups, accelerators, incubators and business angels.
- Expand the entrepreneurial talent pool by attracting talent from outside the region.

Strengthen the position of major CEE cities as startup hubs, tailored to local needs

- Position startup hubs high on municipal governments' agendas and actively communicate the importance of startups.
- Create physical startup clusters where they can cooperate at scale, e.g., Station F in Paris, Blk 71 in Singapore.
- Support the creation of testing grounds for new business models, e.g., implement regulatory sandboxes enabling entrepreneurs to try out their innovations in real market conditions.

Increase access to capital

- Simplify business angel investing, e.g., with standardised, easily available forms and corporations with low capital requirements.
- Provide additional incentives for business angels and serial entrepreneurs, e.g., tax breaks.
- Simplify procedures for obtaining and reporting public/European Union funds.

Strengthen cross-border digital collaboration

KEY FACTS ABOUT THE CZECH REPUBLIC

The Czech Republic can better capture the full potential of digitization by cooperating closely with other CEE economies. Four reasons underpin the benefits of acting together:

- Scale effects: As the CEE region, Digital Challengers represent EUR 1.4 trillion in GDP – seven times the size of the Czech economy.
- Similar starting points: the Czech Republic, like other CEE markets, exhibits high levels of market openness and similar levels of digitization, besides cultural and historic commonalities.
- Common challenges: the Czech Republic faces the same challenges as many other CEE markets, importantly the need to improve ICT-regulatory friendliness and to reskill the workforce in the long-term.
- Best practices: the Czech Republic has developed different strengths related to the digital economy compared to other CEE markets – sharing best practices can accelerate digitization across the region.

See also the CEE Digital Challengers report for more details on already established forms of cooperation between Digital Challengers, as well as Digital Frontrunner markets.

Implications for policy-makers

Create a strong digital pillar within regional collaboration platforms (e.g., 3SI, V4, B9)

Establish a coalition favouring pro-digital legislative measures at the European level, strengthening the voice of individual countries in EU policy discussions.

Assemble working groups at relevant levels to develop a pipeline of priority collaboration areas, e.g., representatives from digitization ministries at the national level, private sector leaders.

Facilitate the sharing of best practices and experience in the region – disseminate what has worked well regarding regulatory policy and investment.

Ensure standardised, flexible digital policy solutions across the region

Cooperate to abolish barriers to the full functioning of the Digital Single Market such as geo-blocking, unjustified data localisation practices, regulatory barriers.

Support the standardisation and free flow of cross-border non-personal data in the public sector, as well as the technological interoperability of digital infrastructures, e.g., 5G networks.

Establish common security models and cybersecurity standards.

Implement cross-border projects facilitating the digitization of the region

Facilitate cross-border digital infrastructure projects that close the gaps across the region, e.g., fibre optics, 5G technology, strategic e-commerce logistic centres, complementary energy infrastructures.

Establish common platforms for cross-border public sector services, including cross-border integration of eID systems, increasing their effectiveness and reducing administrative burdens for enterprises. An example of cross-border collaboration in this space is the Nordic Council's efforts to integrate electronic authentication systems.

Strengthen cross-border industry cooperation over research and education supporting joint technology initiatives such as autonomous transportation, smart cities, human health solutions. An example of cross-border collaboration here is the Franco-German alliance in artificial intelligence.

Cooperate over the management of social change as a result of shifts in the labour market

Improve cross-border freedom of movement, skills accreditation and worker safeguard procedures.

Join forces to tackle talent pool issues such as the brain drain and the need for more ICT and digital skills at all educational levels, e.g., initiate a joint promotional effort marketing the region as a digital hub to attract talent and investments.

Actively adopt technology and innovation to close the gap to digital leaders

KEY FACTS ABOUT THE CZECH REPUBLIC

Whilst the share of both Czech SMEs and large enterprises selling online is larger than both the CEE and the Digital Frontrunners average, there are other dimensions with room for improvement. For instance, these can be seen when looking at the share of enterprises:

- Using social media for branding and marketing (SME gap: -40%, large enterprise gap: -24%)
- Selling online (SME gap: -81%, large enterprise gap: -23%)
- Participating in cross-border e-commerce sales within the EU (SME gap: -17%, no gap for large enterprises)
- Analysing Big Data (SME gap: -38%, large enterprise gap: -41%)
- Using software solutions such as Customer Relationship Management systems (SME gap: -50%, large enterprise gap: -37%)

In terms of providing formal employee training for ICT skill development, the share of companies conducting such activities (at 23%), is also lower than the Digital Frontrunner average (at 29%).

Implications for business leaders

Reimagine your business in the digital economy

Anticipate and prepare digital disruption in your market, in particular the development of digital ecosystems. Ensure you get close to customers to lead a digital ecosystem or at least unbundle and transform products to services to successfully participate. For example, connect in real time to your customers, leverage digital marketing and communication, exploit e-commerce and globalise your reach.

Digitize internally to improve your bottom line and make your businesses scalable. Redesign processes to be cheaper, reduce risk and be more flexible by making them simple, paperless and highly automated.

Launch your digital delivery engines

Embark on a customer experience-driven transformation of all your touch points with customers.

Exploit the power of data science throughout your business. Expand from individual use cases (e.g., predictive maintenance or “Next product to buy”) to a data-driven transformation.

Transform your organisation using Agile at scale principles.

Digitize the day-to-day tasks of your employees using Digital Way of Working tools.

Modernise the IT foundations

Gradually rebuild your architecture to be robust and allow interoperability with external parties. Start from building an API layer that opens your IT to quick integration of new components.

Build cybersecurity capabilities and ensure your digital assets are protected against attacks.

Strengthen capabilities

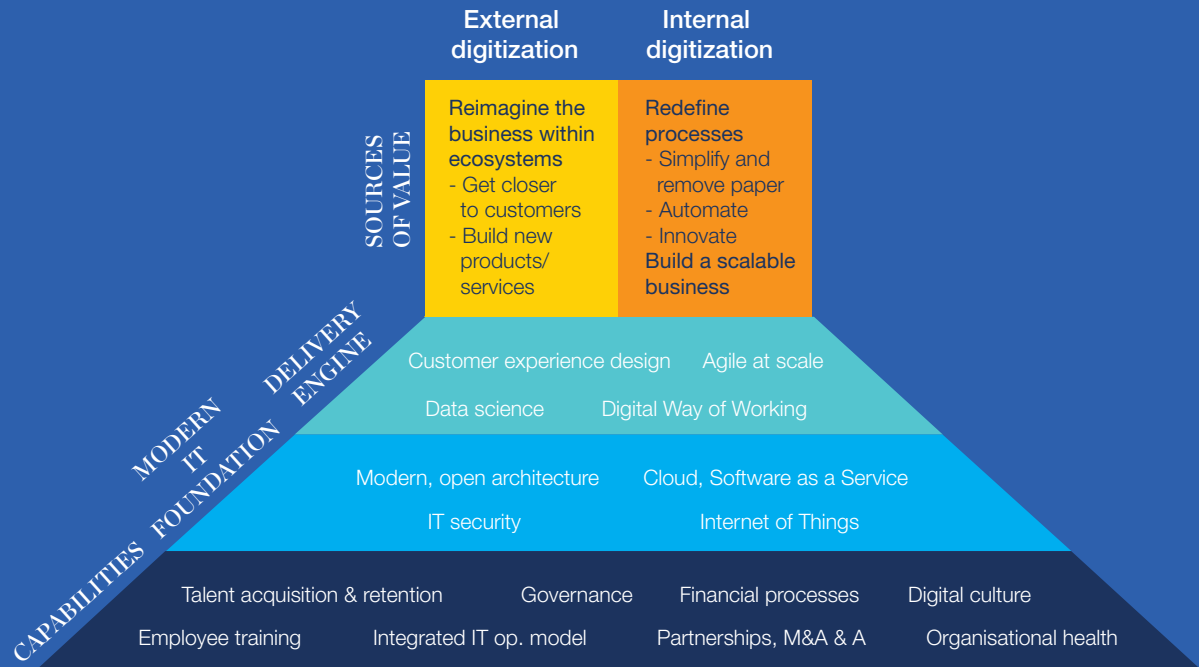
Attract future employees: Shift from reactive to proactive recruiting, e.g., offer workshops and internships, put more focus on assessing candidates’ skills, e.g., through open competitions, games, hackathons and leverage contractors to fill talent gaps using digital platforms to optimise the search.

Reskill and upskill current employees: provide practical in-house training, offer financial support, create opportunities for knowledge-sharing.

Build partnerships, alliances and M&A capabilities focused on driving growth beyond organic.

Digitize the culture and improve organisational health by fostering understanding and conviction among employees on the benefits of digital. Ensure the leadership and middle management act as role models for the digital way of working and entrepreneurship. Implement reinforcement mechanisms.

Get the four levels of the digitization pyramid right



In our experience, the odds of succeeding in the digital world increase when companies master four important levels of the “digitization pyramid”:

1. STRATEGY FOCUSED ON CRITICAL SOURCES OF VALUE

As a first step toward digitization, companies must set their digital strategy by clarifying where they provide distinctive value to consumers and stakeholders and how they will continue to do so in a digital world. This understanding should then drive their external and internal digitization priorities.

A successful external digitization reimagines the company’s business in the context of future digital ecosystems. An ecosystem provides services in a seamless customer journey. For example, a digital B2C marketplace lets you choose a product, buy it, finance the purchase and get an extended warranty and insurance, all in one digital customer journey. External digitization requires that companies get closer to customers and deliver their products and services in a user-friendly way, with superior accessibility and range, and at an attractive price. Frequently, new products and services can be offered, as digital ecosystems facilitate crossing industry boundaries and country borders. The best digital businesses are built to be scalable in terms of growth, geographical footprint and even across industries.

Internal digitization, on the other hand, redefines internal processes to reduce costs, lower risks and increase flex-

ibility. New digital processes are simpler, paperless and automated to a large extent. Even in areas where full automation is not possible, productivity is increased by technological innovations. Internal digitization should go hand in hand with external digitization. Internal actions without customer focus seldom bring growth opportunities. Companies with digital sales that have not digitized their operations and way of working are at a considerable disadvantage to their fully digitized peers.

Determining the right digital strategy is not straightforward. Companies and their advisors use a variety of techniques such as trend immersion, ideation and collision workshops. We apply these approaches within the frame of the McKinsey Strategy Approach, which allows us to combine creativity with robust fact-based assessment and ensure commitment to the chosen digital strategy.

2. BUILD THE DELIVERY ENGINE

Once a digital strategy has been set, companies need to focus on the means by which they will offer targeted digital products and services to their customers. Customer-experience design, data sciences agile development, and digital way of working can all be useful delivery engines.

Customer-experience design refocuses companies from the “products” to customer journeys. Steve Jobs’s famous quote “You’ve got to start with the customer experience and work backwards to the technology” underscores the importance of this area.

Data sciences enable a whole new world where decisions, previously made by expertise, can be made faster, cheaper and better based on data and algorithms or even training of deep neural networks. The list of use cases where data sciences have been successfully applied has quickly grown from traditional areas like credit scoring through operational topics like predictive maintenance to human interactions such as personalised experience and digital personal assistants in e-commerce.

Agile has been around for decades as a software development approach but is increasingly used in digital transformations. Agile involves short, fast “sprints” of development, prototyping, reassessment and adaptation. The agile development approach complements customer-experience design by product orientation that cuts across internal organisation boundaries and accelerates delivery.

Finally, a digital way of working brings technology to the daily life of all employees with immediate productivity and quality improvements, quick learning and a faster feedback loop. Typical DWoW applications are workflow and scheduling (e.g., app with interactive standard operating procedures for maintenance), performance management (e.g., digital dashboards with live data) and enhanced communication (e.g., live video calls).

3. MODERNISE THE IT FOUNDATIONS

Once the digital strategy is defined and digital delivery models decided upon, companies need to examine their IT infrastructure: Is it truly capable of supporting the activities required?

Complex legacy systems usually become a hurdle to fast digitization. Legacy systems have typically been built up in a patchwork fashion: new applications and gateways are bolted on to existing ones. The result is spaghetti code and fragmentation, neither of which promotes speed and transparency in IT operations.

Companies aspiring to be digitization leaders need to modernise their IT foundations in four dimensions:

- Robust architecture with a solid and reliable data backbone to ensure that all data are managed holistically and users can access data sets quickly and easily. Establishing a “golden source” of truth for critical information relating to pricing, products, customers, invoices, and contracts is a critical hygiene factor. Ensure interoperability with external systems using API and stateless microservices.
- Introducing flexibility to IT infrastructures by cloud-based platforms and software-as-a-service products reduces time to market and ultimately also development, roll-out and maintenance costs.
- Many companies also start incorporating connectivity into their IT architectures. This ranges from using sensors to monitor equipment status to wearable devices that monitor personal health and even recommend treatment.

- Of course, companies need rigorous cybersecurity policies and infrastructures to protect the most relevant pieces of information. This requires identifying digital assets (data, systems, and applications) across the business value chain, identifying potential attackers and locating the weakest points and, finally, creating a set of initiatives to address highest-priority risks and gaps in control.

4. STRENGTHEN CORE MANAGEMENT CAPABILITIES

Any large transformation effort requires companies to strengthen and maintain their capabilities in several core areas.

The first is attracting and retaining talent, which goes hand in hand with training and reskilling the current employees. Digital transformations require a deep internal benchmark with expertise in digital technologies and approaches. Recruitment, retention and development capabilities need to be upgraded to incorporate new skill sets, training needs and employee requirements.

Companies need to have a governance structure that is inclusive and gives internal and external stakeholders an opportunity to weigh in on digital decisions. External advisory boards and internal governance councils are increasingly prevalent among rapidly digitizing companies.

An Integrated IT operating model helps companies develop their IT from pilots and digital factories to a digital pure play future. In an integrated model, digital product teams merge with conventional technology teams and organise around capabilities. DevOps methodology is used to improve collaboration and speed up development.

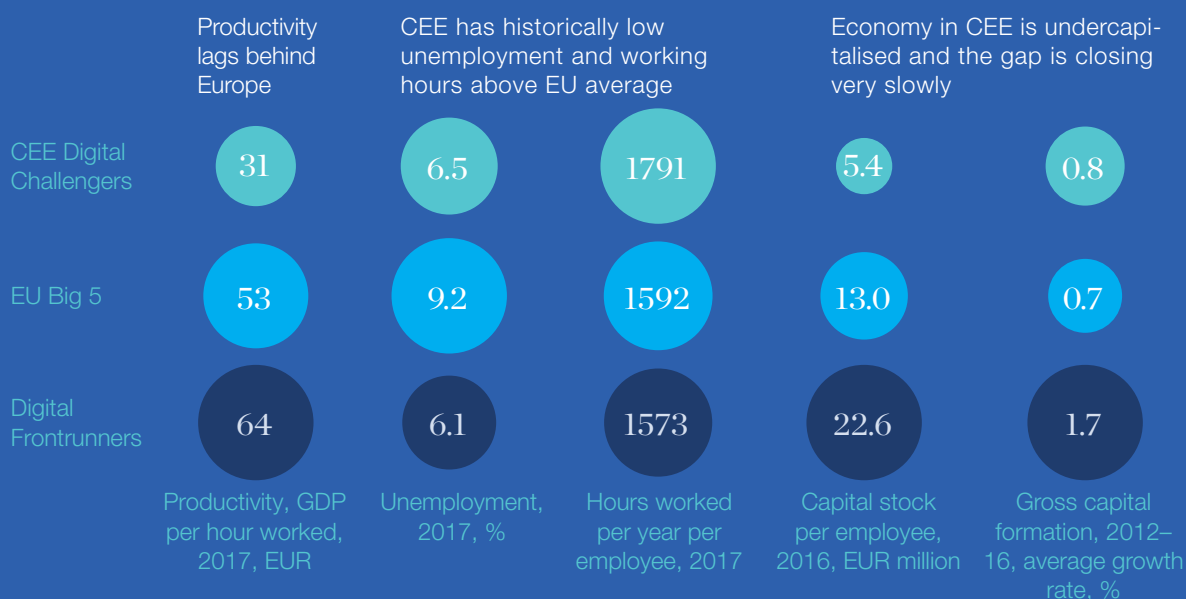
Another core capability is in financial processes, where companies need to ensure that investment priorities are clear, revisited regularly, and updated as needed, and that sufficient capital is available.

Ability to effect partnerships, mergers, acquisitions and alliances is becoming a critical skill in the digital economy. The speed at which technology and markets develop has accelerated to a level when even the best companies cannot rely solely on organic growth.

And last, but never least, culture is critical. Our research suggests that 70% of large transformation efforts fail because of poor organisational health. Digitization requires a healthy work environment open to new ideas and best practices. Senior leaders should focus all employees on five critical questions: Where do we want to go? How ready are we to go there? What must we do to get there? How will we manage the journey? How do we keep moving fast? Senior leaders also need to role model the digital way of working and entrepreneurship.

1

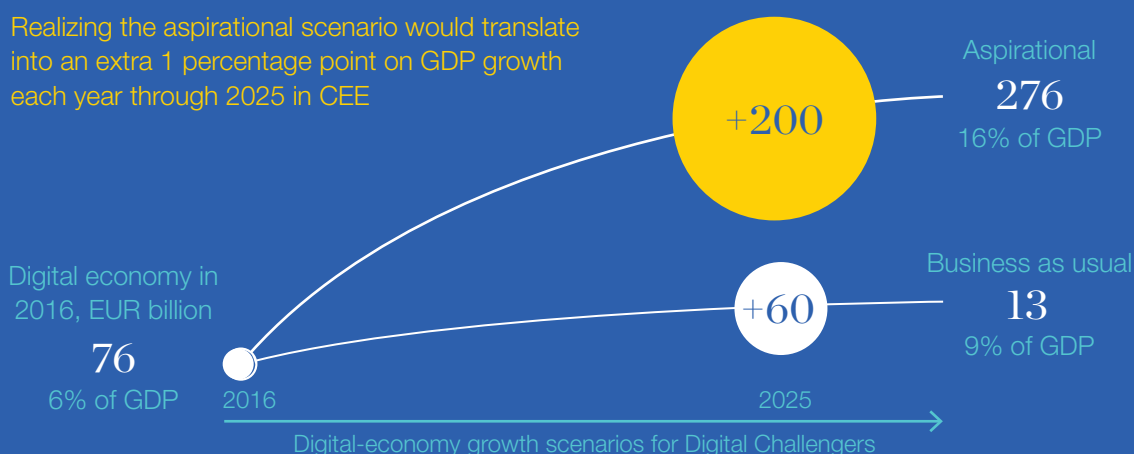
THE GROWTH ENGINE OF CENTRAL AND EASTERN EUROPE IS LOSING MOMENTUM



2

DIGITIZATION CAN BE THE ANSWER TO THIS CHALLENGE

Realizing the aspirational scenario would translate into an extra 1 percentage point on GDP growth each year through 2025 in CEE

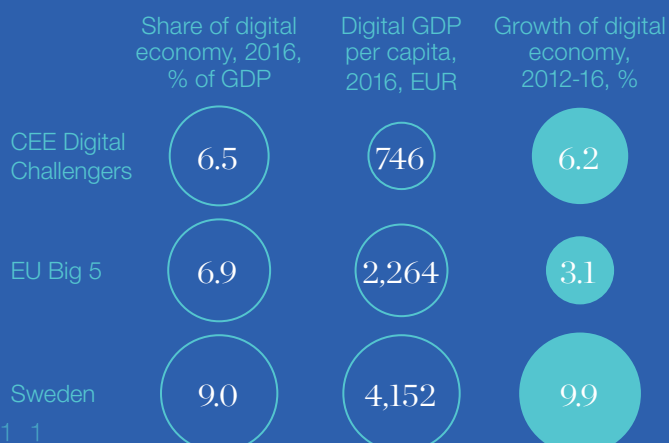


3

THE COUNTRIES IN CEE ARE UNIQUELY POSITIONED TO CAPTURE THIS OPPORTUNITY

Despite a lower size of the digital economy, Digital Challengers can build on a strong historical growth momentum

Digital Challengers have the necessary fundamentals in place for further digitization:



Good primary and secondary education

A large STEM and ICT graduate talent pool

High-quality, affordable digital infrastructure

A milder legacy technology lock-in

An already-emerging, vibrant digital ecosystem

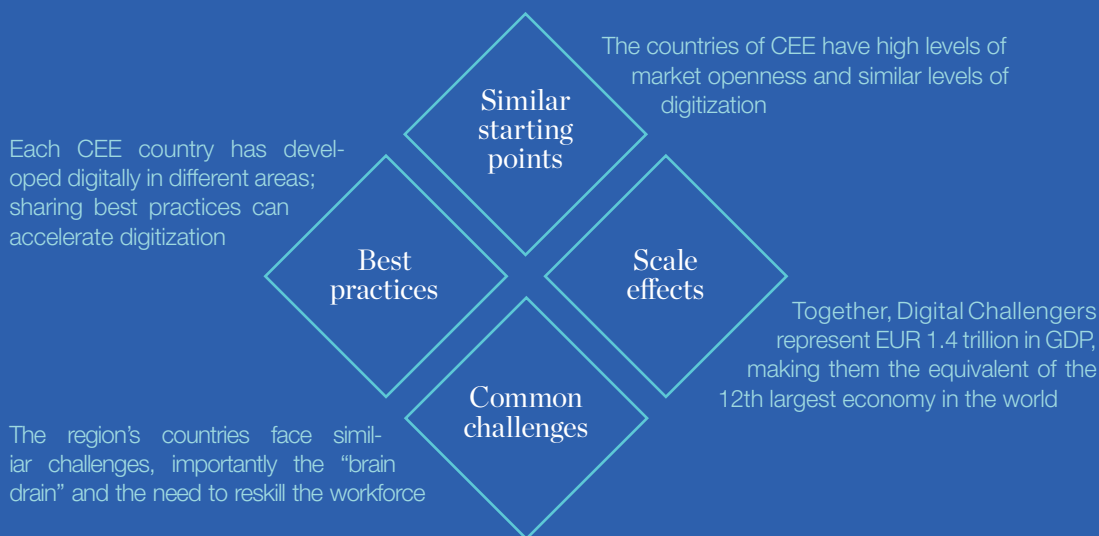
HOW TO CAPTURE THE POTENTIAL?

ALL STAKEHOLDERS NEED TO ACT FOR A SUCCESSFUL TRANSITION



COLLABORATION BETWEEN CEE DIGITAL CHALLENGERS IS KEY

There are four reasons why cooperation is necessary to capture the full potential of digitization in the CEE region:



THE TIME TO ACT IS NOW – OTHERWISE THE REGION MAY MISS THE DIGITAL OPPORTUNITY



Digital Challengers are enjoying an economic boom; this could give new digital initiatives a head-start



The Fourth Industrial Revolution will transform the economy and labour market, requiring an immediate response



The global rules of the digital game are crystallising; to compete, Digital Challengers need to develop a clear digital agenda

Methodology appendix

All calculations were performed using real values for GDP, the value of e-commerce and consumer offline spending. We used a fixed exchange rate from 2016 for all years analysed.

Digitization Index

One of the goals of the Digitization Index is to show the level of digital penetration across sectors by indicating the gap between the “digital frontier” (the most advanced digital sector) and the other parts of the economy. The Digitization Index presents a view across sectors of how corporations invest in ICT (a proxy for ICT spending, calculated as the value of the ICT sector less consumer spending on communication services and equipment) and how they digitize their internal processes. It uses eight indicators to capture different ways in which companies are digitizing. For instance, digital assets include spending on computers, software and telecom equipment and the stock of ICT assets. Workforce, on the other hand, is calculated on a per-worker spending basis. We measure this by aggregating digitization scores across sectors, which is easily comparable between European countries against the United States. To calculate the digitization scores, the Digitization Index is weighted for the economic size of the sector, to measure the distance of each sector from the global digital frontier, namely the ICT sector in the United States. This sector was chosen as the global digital frontier as previous MGI research¹² shows that it is the most digitized sector in the world across comparable groups of metrics.

The digital economy

Definitions on the size of the digital economy vary significantly in terms of their scope. On one end of the spectrum, it is often defined simply as the value of the ICT sector.¹³ On the other end of the spectrum, institutions such as the IMF use studies¹⁴ that define it as all digital activities in all sectors of the economy. In our report we use the latter definition, while ensuring that the digital economy in our definition is quantifiable and comparable between countries.

Impact scenarios

Baseline growth

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

E-commerce and offline spending

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

Digitization potential in the public and private sectors

We assume that the Digitization Index in CEE will reach the level found in the Digital Frontrunner Sweden. We use Sweden as a benchmark because of its digital maturity and its inspiring digital growth in recent years. To assess the potential impact, we first analyse productivity and digitization levels in CEE. We then calculate the digitization potential in CEE based on the Swedish sectors’ productivity rates, incorporating digitization multipliers. Finally, we estimate the potential productivity growth in the CEE economy caused by traditional ICT growth vs. the productivity baseline for each country.

Internet of Things, Big Data and artificial intelligence use cases

We assess how the Internet of Things (IoT) can create value by analysing more than 150 IoT use cases across the global economy. Based on our prioritisation, we examine the 57 of these use cases that promise to bring the highest value. We use bottom-up modelling to assess the potential benefits that these use cases can generate, including productivity improvements, time savings and improved asset utilisation. We also include an approximate economic value for reduced disease, accidents and deaths.

Automation potential

To understand the impact of automation on the labour market, the McKinsey Global Institute analysed around 800 different occupations and more than 2,000 work activities. Each of the activities was assigned a combination of 18 predefined performance capabilities (for example, fine motor skills, sensory perception, natural language understanding). Its automation potential based on technologies available today was then estimated. By aggregating the automation potential of activities and their share in total working hours, we can estimate the potential for each occupation and industry. ■

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Endnotes

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