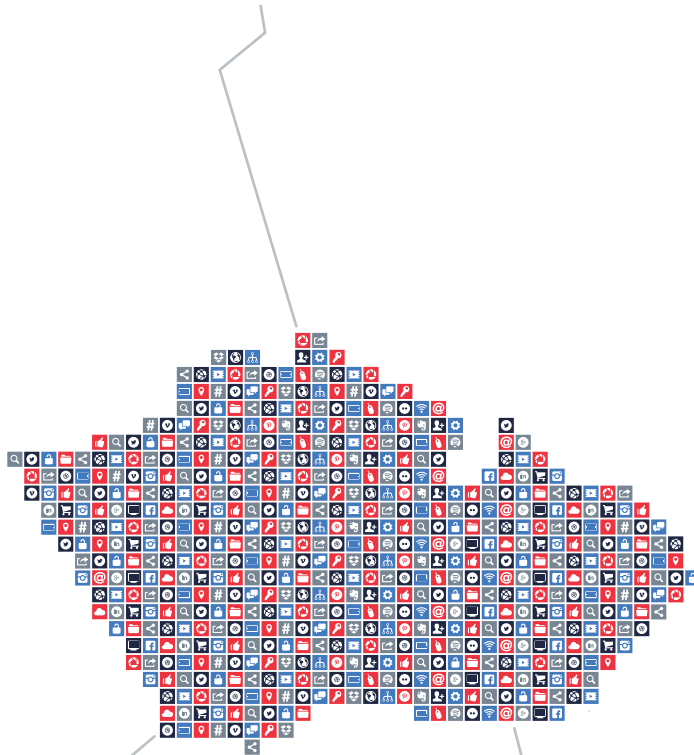


# Digital Transformation of Small and Medium Enterprises in the **CZECH REPUBLIC**



DELab UW Country Report

April 2016

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# Acronyms

- B2B – Business to Business
- B2C – Business to Customer
- B2G – Business to Government
- CRM – Customer Relationship Management
- DESI – Digital Economy and Society Index
- ERP – Enterprise Resource Planning
- EU15 – Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom
- EU28 – all EU member states
- ICT – Information Communications Technologies
- Mbps – Megabits (Mb) per second
- NMS13 – Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic, Slovenia
- RFID – Radio-frequency identification
- SCM – Supply Chain Management
- SMEs – Small and Medium-sized Enterprises

# Executive Summary

In this report we examine the level of digital transformation of SMEs in the Czech Republic in comparison to SMEs from other EU countries. We take into consideration both the digital business environment (digital infrastructure such as Internet availability and digital skills of human capital) and the adoption of digital technologies. The introduction of digital technologies such as websites, social media, e-commerce, electronic information sharing and cloud computing simplifies and accelerates decision making, allows effective brand building, facilitates transactions and makes it possible to reach new customers.

## **Why is it so important for SMEs to go digital?**

Internet and digital tools become a must in the context of the Digital Single Market strategy. The regulations proposed within the DSM greatly enhance the opportunities stemming from successful digital transformation, as well as pose risks connected with losing markets and customers due to digital business illiteracy. Although the digital revolution affects both ICT and traditional businesses, it puts significant pressure on Small and Medium Enterprises (SMEs) that are relatively more sensitive to global competition occurring within the Internet compared to their stronger, bigger counterparts.

## **Are Czech SMEs ready to compete on the Digital Single Market?**

Our analysis suggests that Czech enterprises operate in a relatively supportive digital environment. The digital infrastructure is quite developed, although the Czech Republic lags behind the NMS13 average in subscription to fast broadband. Czechs report sufficient digital skills, although they need to work on their Communication and Software skills and to get more familiar with online services. In several aspects Czech SMEs are among the digital leaders of the region or even of the EU: they strongly engage in e-commerce and lead in using websites for presenting their products and prices. They are more advanced than the other NMS13 countries when it comes to using cloud computing, however they still do not measure up to their EU15 counterparts. Additionally, they do not use the full business potential of social media and other digital tools, such as CRM in the area of communication with their customers. Promisingly, Czech entrepreneurs clearly appreciate the value of digitally skilled workers and invest in their training.

# Definitions

## **Digital transformation of enterprises**

Changes in the functioning of enterprises due to the adjustments in business environment associated with the new application of digital technologies

## **Digital business environment**

The digital skills of human capital and the development of digital infrastructure enabling utilisation of digital technologies

## **Digital skills of human capital**

Adoption and skillful utilisation of digital technologies by human capital

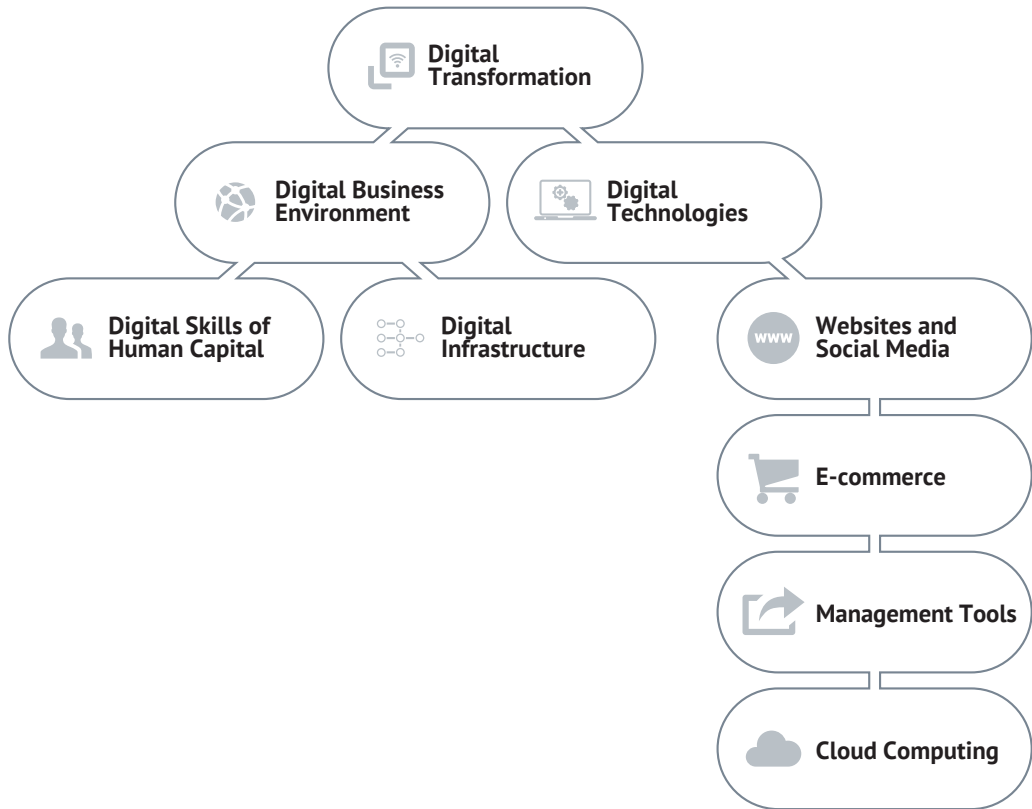
## **Digital infrastructure**

Structure needed for adoption and utilisation of digital technologies; facilities to interconnect components of digital business environment

## **Digital technologies**

Electronic tools, systems, devices and resources that generate, store or process data: websites, social media, e-commerce, management tools, cloud computing

# Main Concepts



Digital transformation enables and accelerates the smart integration of products and services into the economy and society. Its strongest effect lies in the optimal combination of digital technologies with digital business environment.

The more developed the digital infrastructure and digital skills within a society, the better the utilisation of digital technologies. Similarly, the higher the utilisation of digital technologies, the higher the demand for human capital to employ and upgrade digital inventions. Digital tools enable smart economic integration of production and delivery of products and services to customers. Digitally aware SMEs find new market opportunities with greater ease, grow their business partner networks faster and obtain quality feedback from their clients through customer relation management tools.

# The Czech Republic in a Nutshell

## Key findings for SMEs in the Czech Republic



- Lead in setting up websites
- Readily adopt management tools
- Excel in e-commerce (both B2B and B2C) to other EU markets
- Provide training for employees to increase their digital skills



- Rarely use social media, particularly for communication with customers
- Employ a relatively small number of ICT specialists
- Have limited access to digitally high-skilled labour force, especially in digital communication and software skills
- Do not fully exploit benefits of using CRM software and cloud computing

## The Czech Republic in the EU28



- 12<sup>th</sup> in Integration of Digital Technology
- 14<sup>th</sup> in Human Capital



- 15<sup>th</sup> in Connectivity
- 20<sup>th</sup> in Use of the Internet
- 24<sup>th</sup> in Digital Public Services



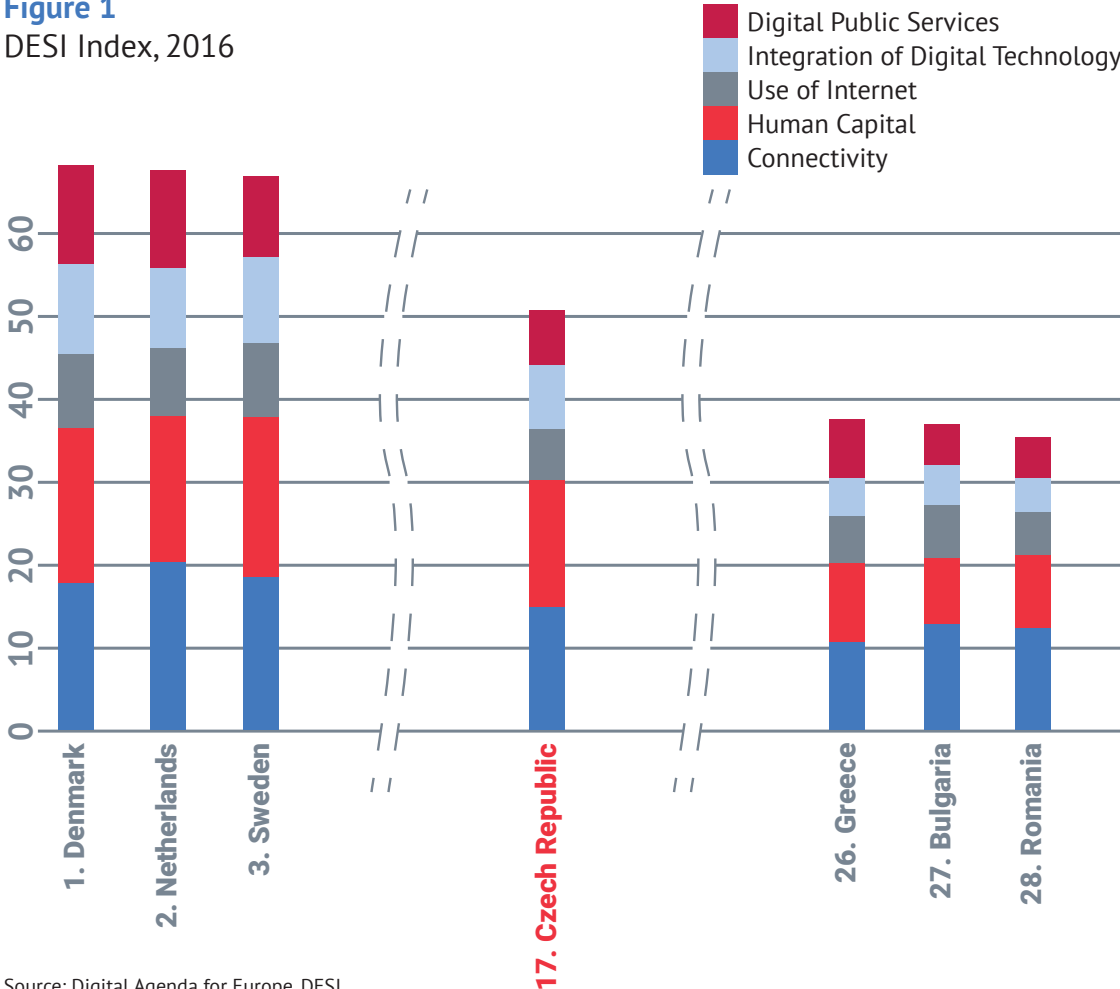
# Digital Map: the Czech Republic in the EU28

“Digital Economy and Society Index” (DESI) measures the degree of digital transformation of the EU member states. Namely, the index reports the level of development in the following categories: access, speed and quality of Internet infrastructure (represented by “Connectivity”), digital skills of society (“Human Capital” and “Use of Internet”), digitalisation of businesses (“Integration of Digital Technology”) and public e-services.

According to the DESI Index, the Czech Republic takes the 17<sup>th</sup> place among the EU28, coming fourth among the NMS13, following Estonia, Malta and Lithuania. The greatest challenge for the country is the improvement in the provision of Digital Public Services, which indicates the online interaction between the public administration and citizens. The Czech Republic is only 24<sup>th</sup> in this dimension, which is reflected by the very low share of Czech e-government users (27<sup>th</sup> position).

In terms of Connectivity (which measures the deployment of broadband infrastructure and its quality), the country takes the 15<sup>th</sup> place in the EU. The Czech Republic ranks 9<sup>th</sup> in the fixed broadband take-up, 13<sup>th</sup> in mobile broadband take-up and 15<sup>th</sup> in the share of subscriptions to high-speed Internet. In terms of Human Capital, which measures the level of digital skills of the society, the Czech Republic ranks 14<sup>th</sup>, which is the third best result among the NMS13. However, in terms of Use of Internet, the country remains at a relatively low level and takes only the 20<sup>th</sup> place among the EU28. This means that the share of Czech Internet users engaging in various online services is relatively low. As an example, the Czech Republic has the second worst position in the usage of social networks by individuals or of subscription to video on demand in the EU.

**Figure 1**  
DESI Index, 2016

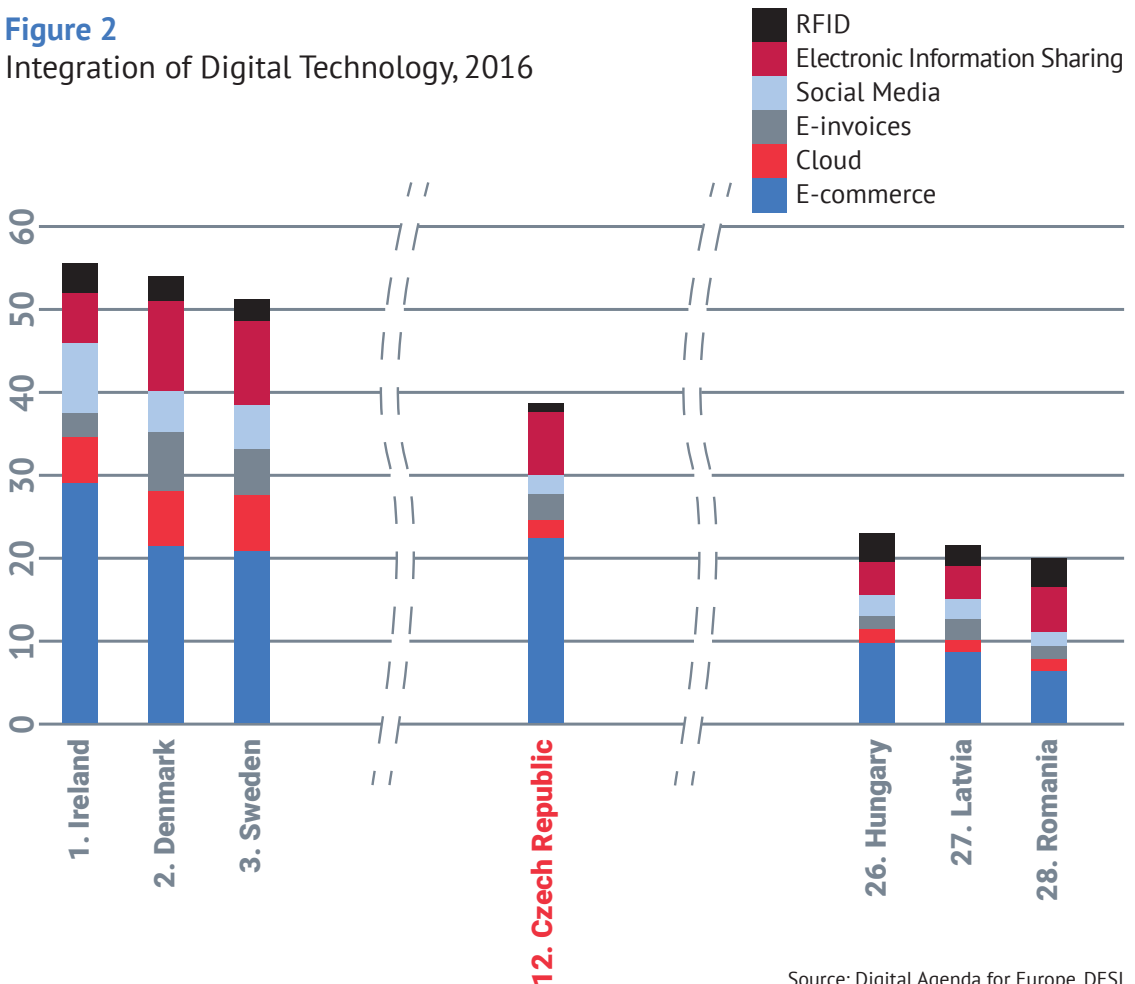


Source: Digital Agenda for Europe, DESI



Integration of Digital Technology represents the level of digital transformation achieved by enterprises (with more than 10 employees).. It is measured by the adoption of digital tools, like cloud computing services, and the engagement in e-commerce. Overall, the Czech Republic ranks 12<sup>th</sup>, which is the third best position among the NMS13. This is mainly due to the strong engagement of Czech firms in e-commerce: they take the 6<sup>th</sup> place in the share of firms selling online, 2<sup>nd</sup> in e-commerce turnover and the 3<sup>rd</sup> in cross-border online selling. Czech enterprises are also performing quite well in terms of usage of e-invoices (13<sup>th</sup> place). However, in the uptake of cloud computing services, electronic information sharing (i.e. digital management tools), social media and radio-frequency identification (RFID), the country falls behind the EU28 average. Czech enterprises rank 23<sup>rd</sup> in social media usage and they are last in RFID usage.

**Figure 2**  
Integration of Digital Technology, 2016



Source: Digital Agenda for Europe, DESI



# Digital Business Environment for SMEs

Digital Business Environment creates the common framework that enables SMEs to utilise digital technology and facilitates engagement of SMEs in the digital economy.

We assess Digital Business Environment by analysing the development of digital skills and digital infrastructure. More precisely, we consider the efforts of companies in hiring and training digitally skilled people (including, but not exclusively, ICT specialists) and we assess digital infrastructure by the access, affordability, speed and quality of the Internet.

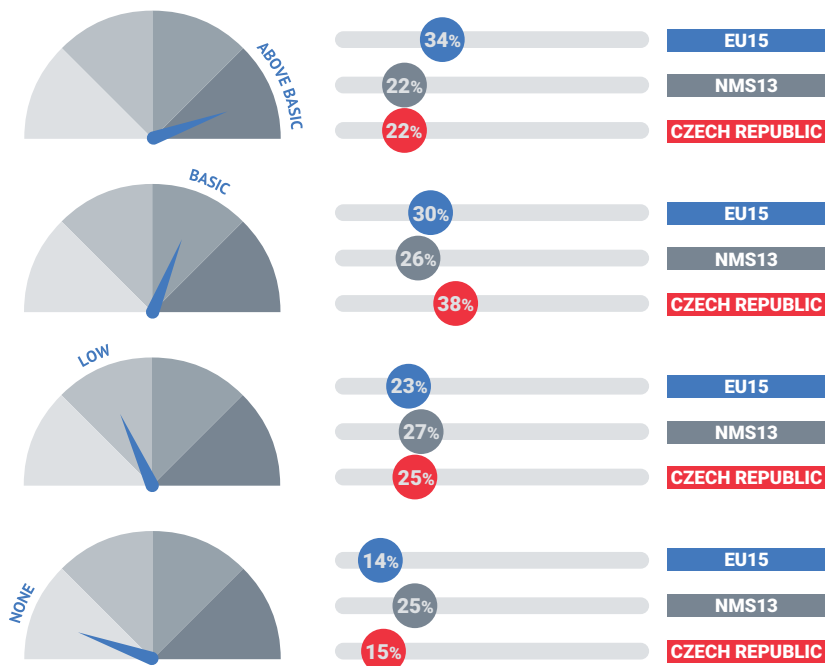


## Digital Skills

When it comes to digital skills, Czechs perform slightly better than other NMS citizens, but lag considerably behind the EU15 level. The advantage of Czech individuals over the NMS13 is in the higher share of users with “basic” skills (38%, while the NMS13 average is only 26%), and the significantly lower share of individuals without any digital skills (15% against the NMS13 level of 25%). However, Czechs lag behind the EU15 in terms of “above basic” digital skills.

**Figure 3**

Levels of digital skills amongst individuals (%), 2015

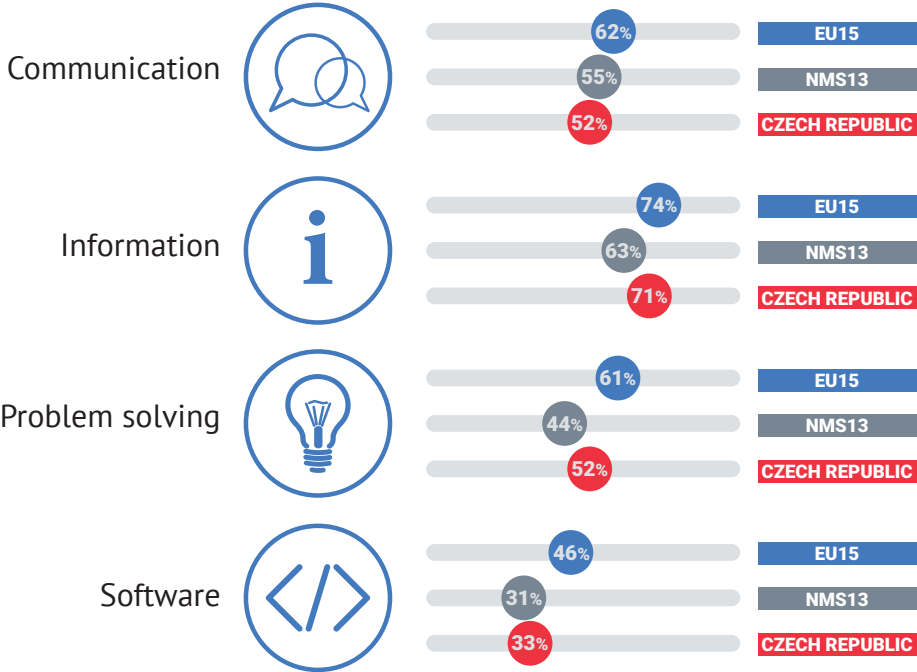


**Above basic skills** refer to the ability to carry out most of the tasks in all of four general categories (Communication, Information, Problem Solving and Software)  
**Basic skills** refer to the ability to carry out one specific task in each category  
**Low skills** refer to users who are unable to perform any tasks in up to 3 categories  
**No skills** refer to users who are unable to perform any tasks in all categories listed including those who have not accessed the Internet in the last 3 months

Source: DELab UW own calculations based on the data from Eurostat

While every third individual from the EU15 reports “above basic” skills, in the Czech Republic only every fourth individual does so. Also, a huge gap is revealed in the specific skill categories, especially in communication and software skills, where the difference in the share of individuals with “above basic” skills is around 10 percentage points. In the EU15 every second person reports “above basic” software skills, while in the Czech Republic only every third individual does so. The lower level of communication skills can be attributed to the low engagement in digital social networks: only 39% of Czechs participate in them, while the EU15 average is 55%.

**Figure 4**  
Individuals with “above basic” digital skills (%), 2015

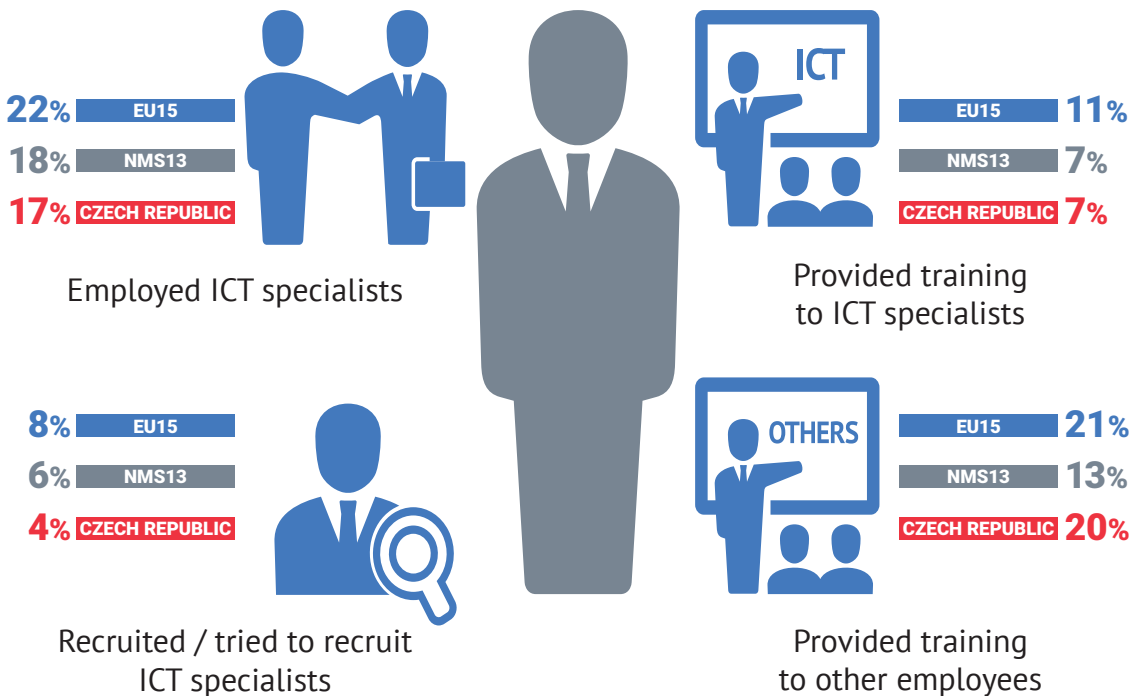


**Communication skills** include the ability to communicate online via e-mail, video calls or the social media  
**Information skills** show the ability to find relevant information online  
**Problem solving skills** represent the ability to manage files, change settings of software and use online services  
**Software skills** include the ability to use word processing, spreadsheet and multimedia editing software

Source: DELab UW own calculations based on the data from Eurostat

Overall, SMEs in the Czech Republic reveal a lower demand for ICT specialists: they employ and recruit less specialists than enterprises in the NMS13. However, SMEs' efforts to improve ICT-related skills of ICT specialists is at the average regional level. Moreover, the share of Czech SMEs that provide training to upgrade ICT skills of other employees is above the average regional level. While in the NMS13 13% of enterprises invest in ICT training for them, in the Czech Republic it amounts to 20% of SMEs. It is nearly as much as in the EU15, where 21% of SMEs provide training to improve the digital skills of employees.

**Figure 5**  
SMEs employing and training ICT specialists (%), 2015



Source: DELab UW own calculations based on the data from Eurostat



# Digital Infrastructure

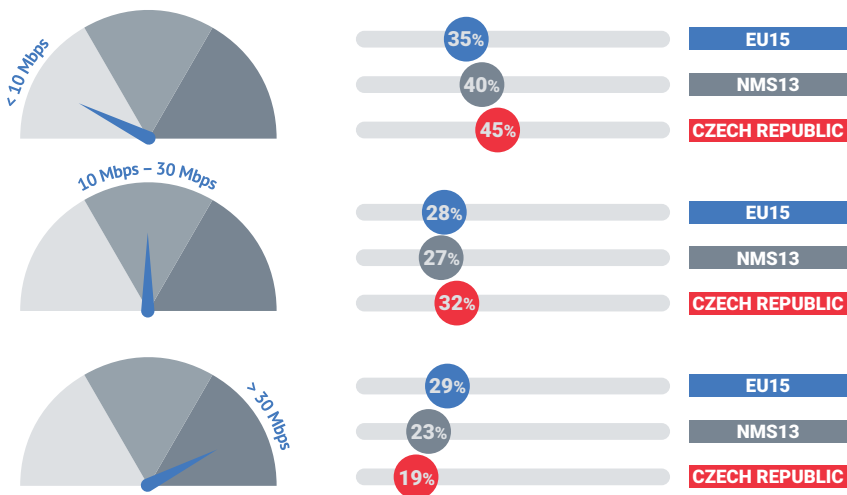
The access to high-speed Internet should be the cornerstone of digital infrastructure. In the Czech Republic, the share of SMEs without Internet connection is around the EU15 level (2%). Therefore, Internet accessibility is not limiting the digital transformation of SMEs.

**Figure 6**  
SMEs with no Internet access (%), 2015



Czech SMEs mainly use low (45%) and medium-speed (32%) Internet. Moreover, whilst in the EU15 every third SME has high-speed Internet access, in the Czech Republic only every fifth enterprise benefits from the high-speed Internet.

**Figure 7**  
SMEs according to the speed of their fixed Internet connection (%), 2015



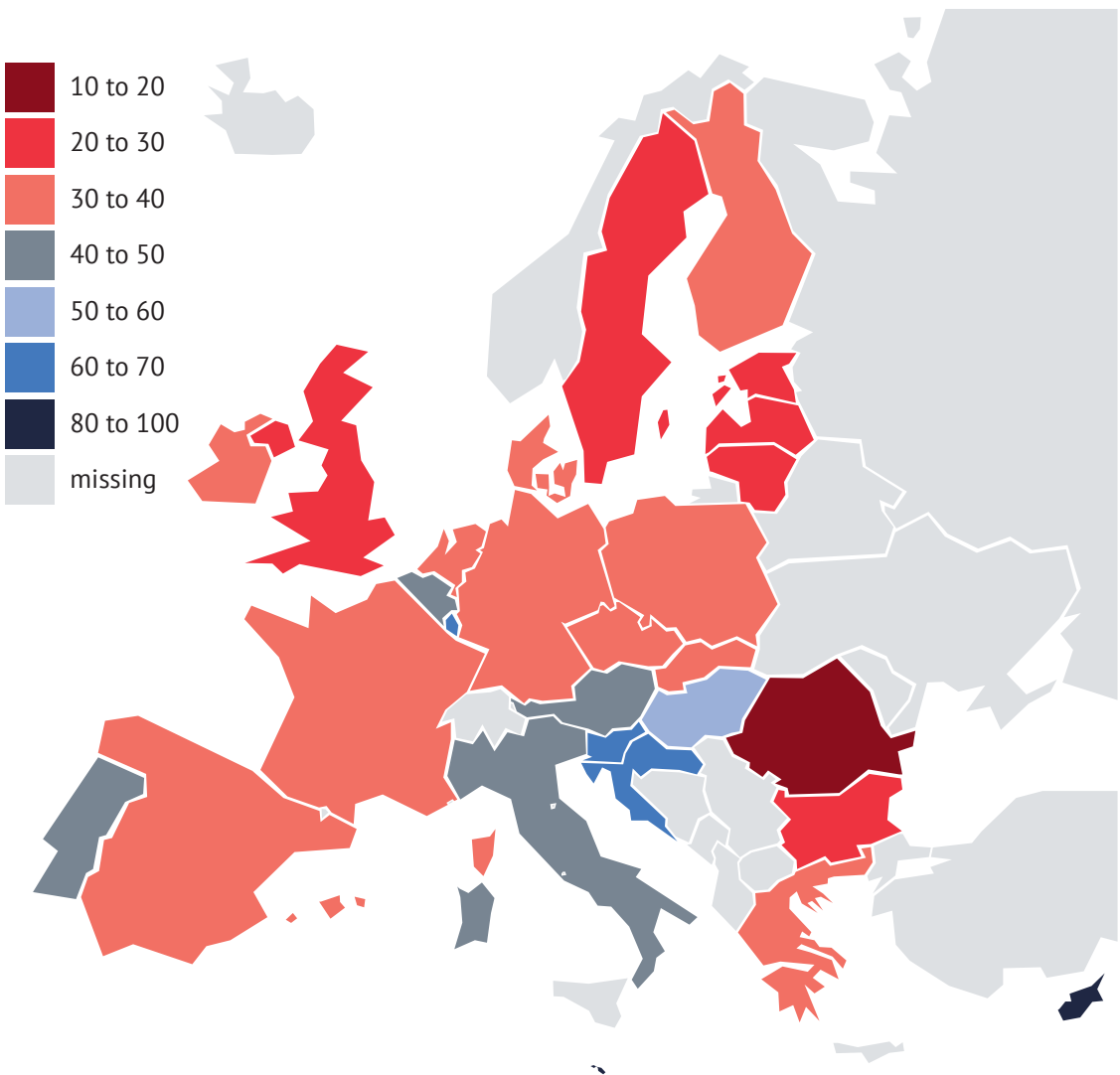
Source: DELab UW own calculations based on the data from Eurostat



The cost of high-speed Internet is at a moderate level in the Czech Republic. The median monthly subscription costs 37 euros, which is the same as the EU15 average, but much less than the average price in the NMS13 (44 euros).

### Figure 8

Median price of monthly subscription to the Internet (30-100 Mbps) in euros/PPP, 2015



Source: DELab UW own calculations based on the data from Eurostat

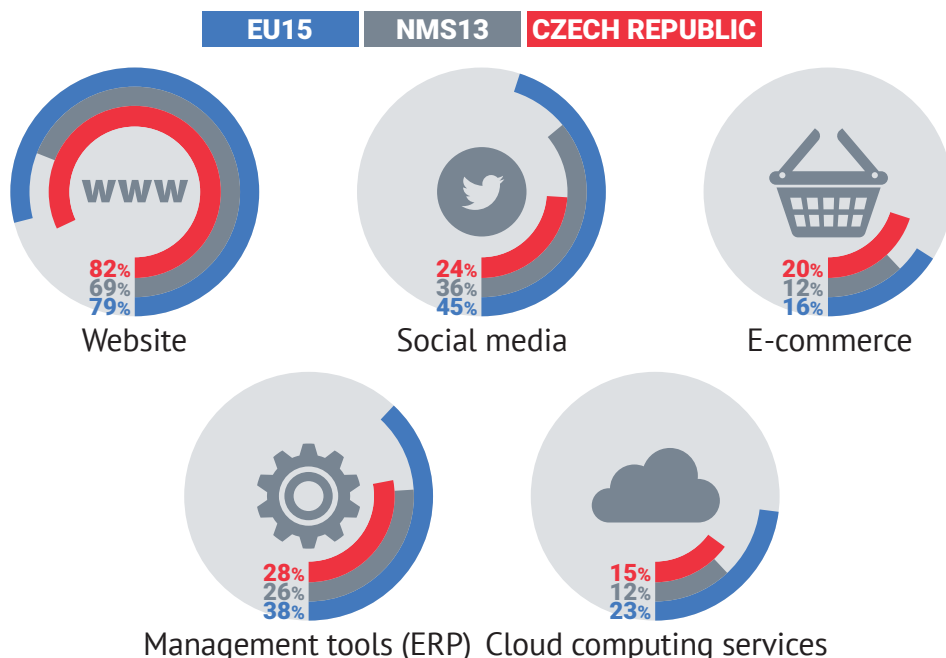


# Digital Technologies

The usage of digital technologies simplifies and accelerates decision-making processes within the enterprise; allows more effective business analyses; facilitates the communication with business partners; allows effective image and brand building; and supports the penetration of new markets as well as reaching new customers. To measure the adoption of digital tools we consider the usage of five key technologies: websites, social media, e-commerce, management tools (like ERP) and cloud computing.

Overall, more SMEs in the Czech Republic use digital tools than the enterprises in the NMS13. The Czech republic leads the EU in e-commerce and in setting up websites. Although in terms of adoption of cloud computing and management tools, Czech enterprises exceed the average regional level, they fall behind the performance of enterprises in the EU15.

**Figure 9**  
SMEs using main digital technologies (%), 2015

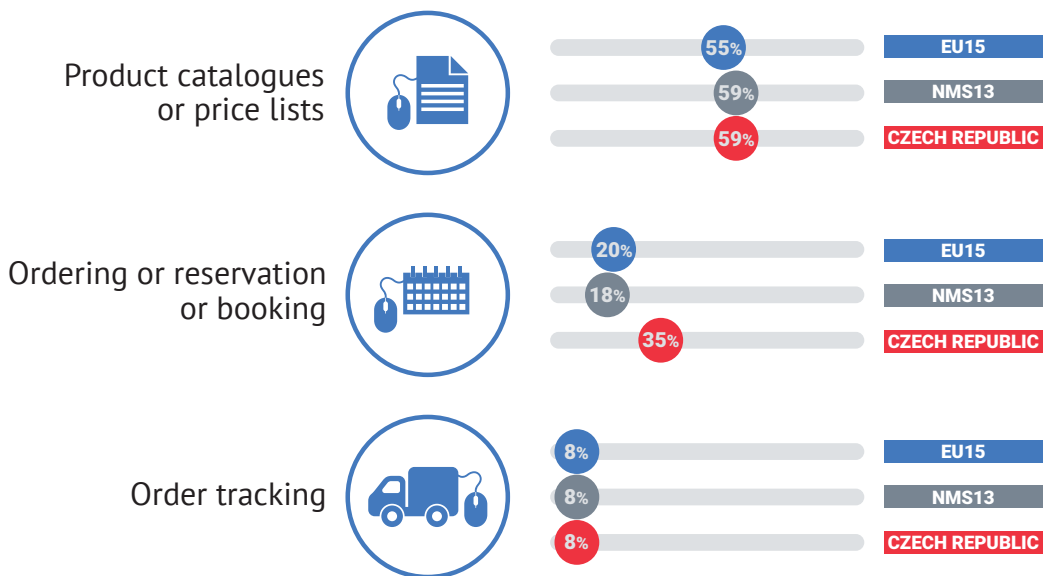


Source: DELab UW own calculations based on the data from Eurostat

# WWW Websites and Social Media

The share of Czech SMEs with websites (82%) is above the EU15 level (79%). Czech SMEs, similarly to all the others in the EU, mainly use websites to provide information about products and prices. However, 35% of SMEs in the Czech Republic offer online ordering, reservation and booking (e.g. shopping cart) on their websites, which is well above the EU15 average of 20%. This also supports the high engagement of Czech enterprises in e-commerce.

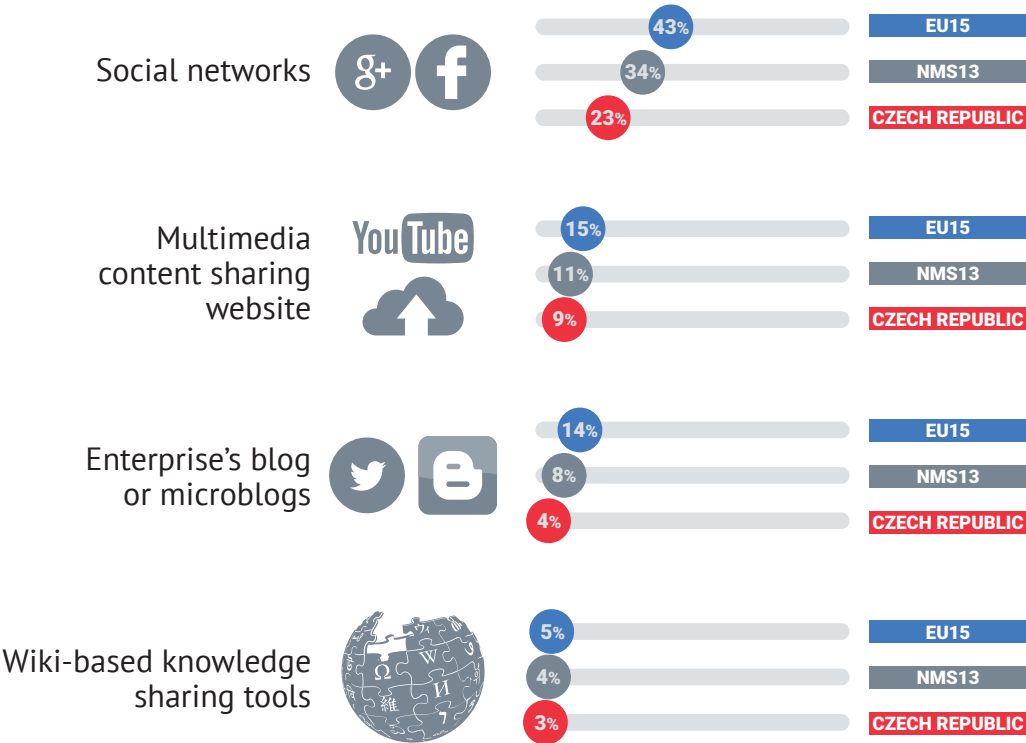
**Figure 10**  
SMEs with websites providing selected services (%), 2015



Source: DELab UW own calculations based on the data from Eurostat

Overall, every third SME in the NMS13 is engaged in some kind of social media, while in the Czech Republic only every fourth SME does so. Moreover, the gap between the Czech and EU15 SMEs is very significant in all analysed types of social media. The biggest gap comes in the usage of blogs or microblogs: on average, the share of Czech SMEs using these channels is three times smaller than in the EU15.

**Figure 11**  
SMEs using social media services (%), 2015

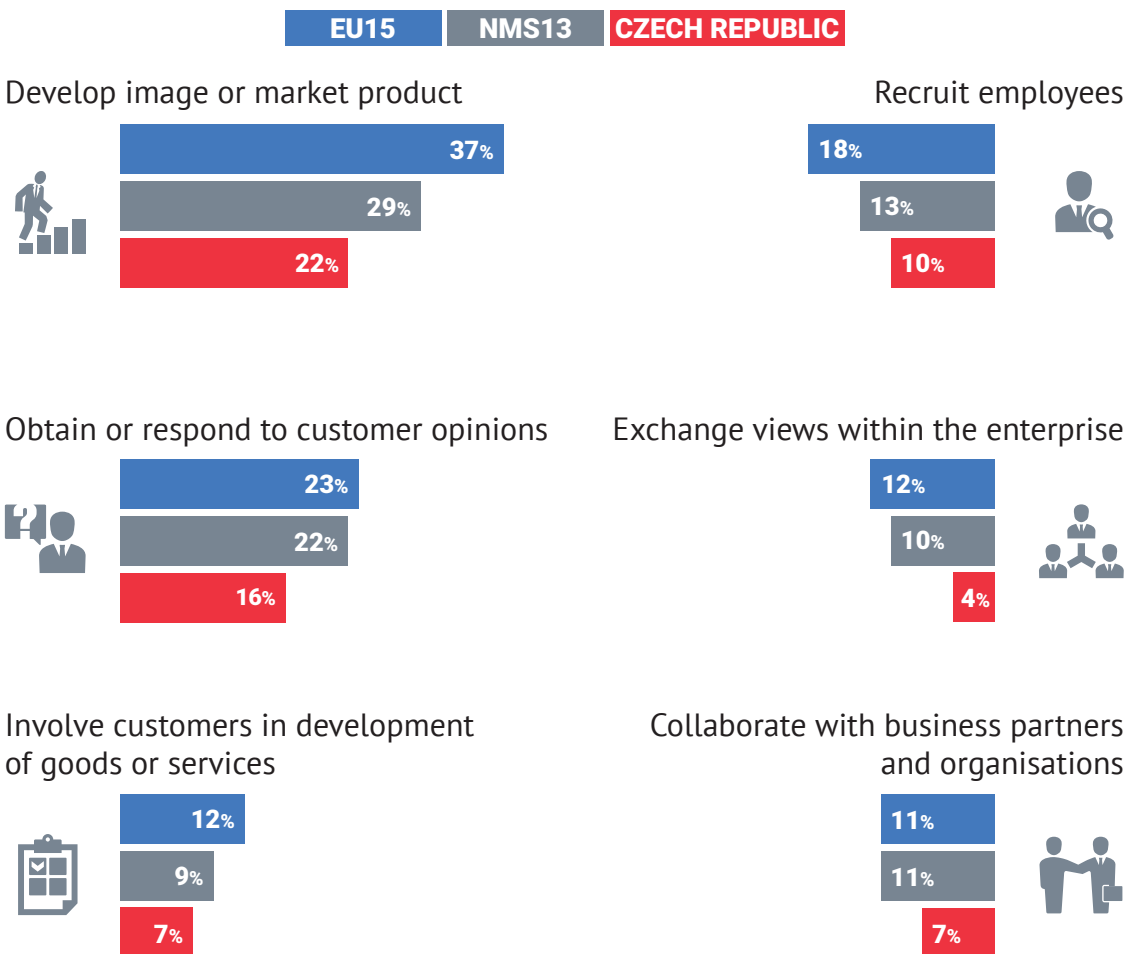


Source: DELab UW own calculations based on the data from Eurostat

Czech SMEs, similarly to enterprises in the rest of the EU, mainly use social media to develop image or market products. However, while every third SME in the EU15 is using social media for this purpose, in the Czech Republic only every fifth SME does so. Moreover, social media usage is not only limited in external communication with customers, but also in the communication within the company. The share of Czech SMEs using social media to exchange views within the enterprise is three times less than in the EU15. Additionally, the share of Czech SMEs collaborating with business partners (7%) or recruiting employees (10%) via social media is much smaller compared to the EU15 (11% and 13%, respectively).

**Figure 12**

Reasons for using social media services by SMEs (%), 2015



Source: DELab UW own calculations based on the data from Eurostat



# E-commerce

An **e-commerce transaction** is the sale or purchase of goods or services conducted over computer networks

**Business to Consumer (B2C)** refers to sales to private consumers

**Business to Business (B2B)** refers to sales to other enterprises

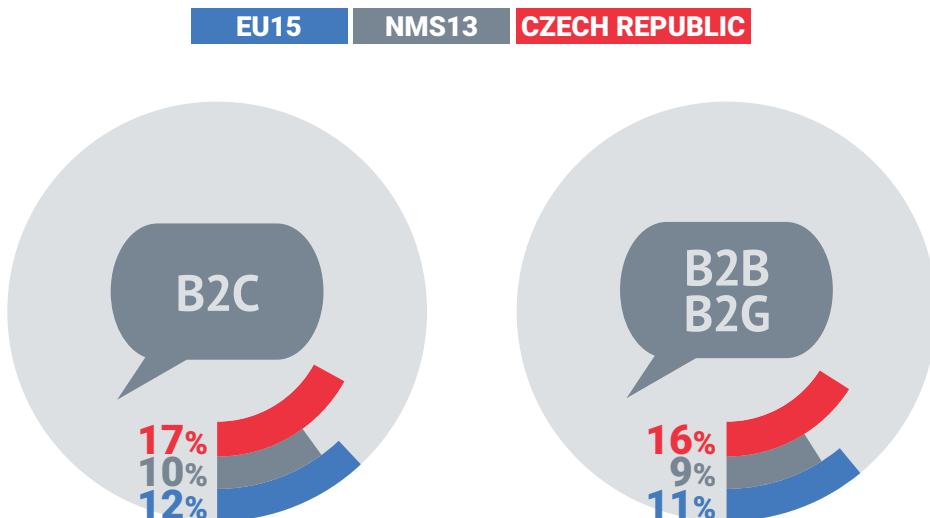
**Business to Government (B2G)** refers to sales to public authorities

E-commerce is the main strength of the Czech digital economy: 20% of SMEs sell online, while the EU15 average is 16%. Czech SMEs outperform the rest of the EU in both selling to private consumers (B2C), and to other enterprises (B2B) and public authorities (B2G) as well.

The high share of e-commerce in the Czech Republic is related to the openness of the Czech economy (the ratio of trade in goods and services to GDP equals 160%, which is high in comparison with the EU average of 81%).

**Figure 13**

SMEs selling via a website or apps (%), by type of transaction, 2015

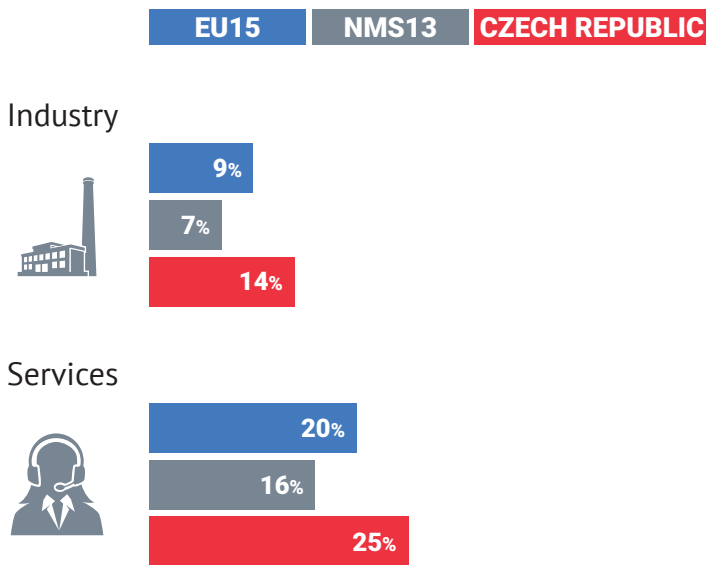


Source: DELab UW own calculations based on the data from Eurostat

SMEs in the Czech Republic engage in e-commerce above the EU15 level in both industry and services. Overall, 14% of SMEs sell online in industries, and 25% in services (for the EU15, respective shares are 9% and 20%). More specifically, the share of Czech firms selling online is the highest in tourism (travel agencies, accommodation providers), publishing activities and telecommunications.

### Figure 14

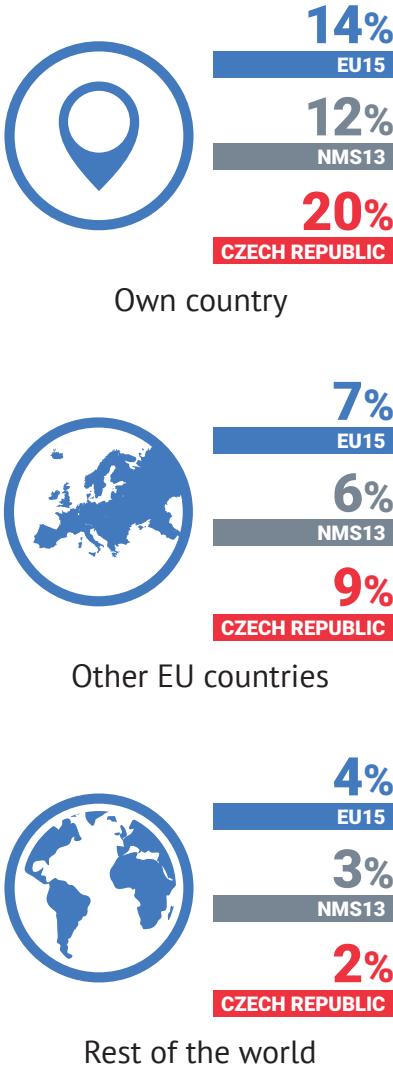
SMEs selling via a website or apps, according to sectors (%), 2015



Source: DELab UW own calculations based on the data from Eurostat

Czech SMEs are not only highly involved in domestic electronic sales, but also in cross-border e-commerce. The share of SMEs selling to other EU countries is significantly higher than that of the EU15 (12% against 9%). However, the number of enterprises selling outside the EU is smaller in the Czech Republic than in the EU15. Therefore, for further development of e-commerce, Czech SMEs should increase their electronic sales in the markets outside the EU.

**Figure 15**  
SMEs engaged in electronic sales (%), 2015



Source: DELab UW own calculations based on the data from Eurostat





## Management Tools

**Management tools (Enterprise Resource Planning - ERP)** enable automatic flow of information between different business functions such as accounting, planning, production and marketing.

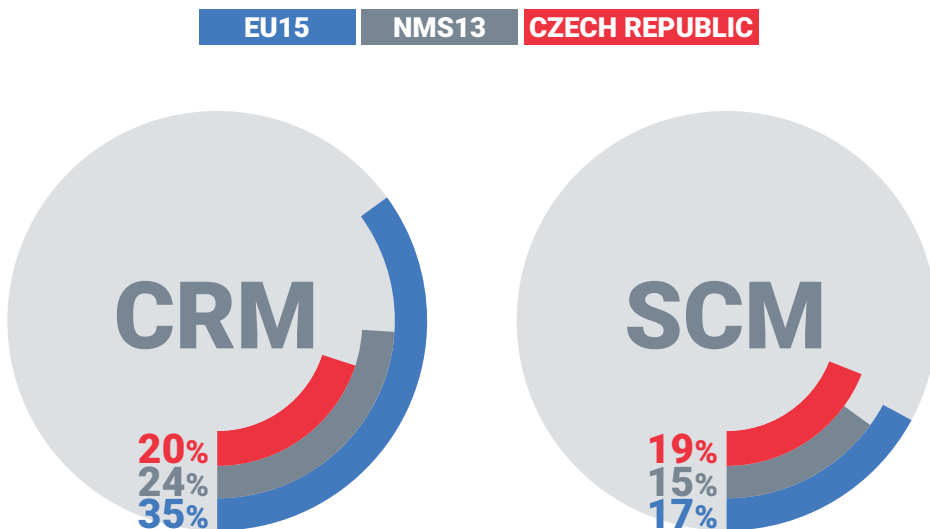
**Supply Chain Management (SCM)** means exchanging all types of information with suppliers and/or customers about the availability, production, development and distribution of goods or services.

**Customer Relationship Management (CRM)** is a management methodology which places the customer at the centre of the business activity, based on an intensive use of information technologies to collect, integrate, process and analyse information related to the customers.

The share of SMEs that use SCM in the Czech Republic exceeds both the average regional level and the EU15 level. However, the utilisation of CRM falls behind both the EU15 (35%) and the NMS13 (24%): in the Czech Republic, only 20% of SMEs employ this kind of software.

**Figure 16**

SMEs using CRM and SCM software (%), 2015



Source: DELab UW own calculations based on the data from Eurostat



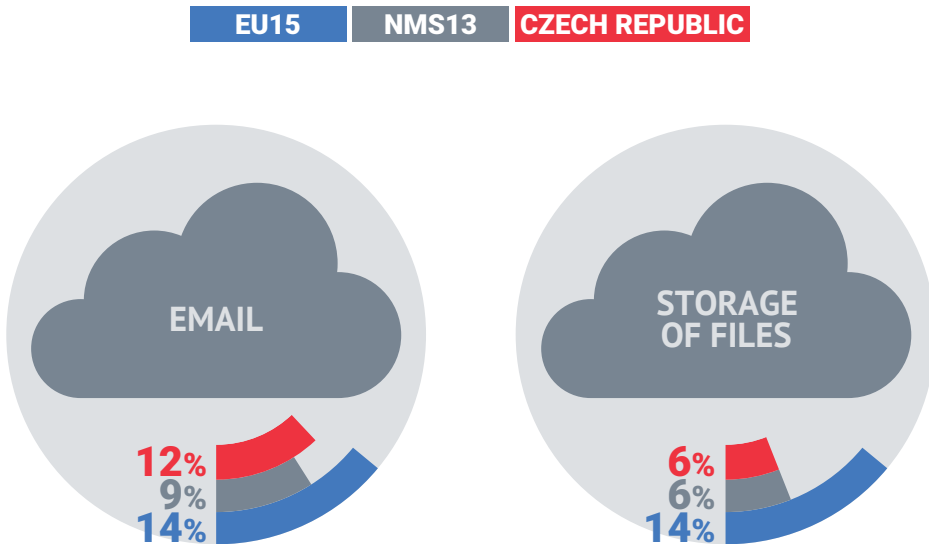
# Cloud Computing

**Cloud Computing (CC)** refers to ICT services that are used over the Internet to access software, computing power, storage capacity, etc.

Only 15% of Czech SMEs use cloud computing services, which is above the NMS13 average (12%), but still 8 percentage points below the EU15 level. However, in terms of usage of e-mail as a CC service, Czech SMEs are close to the EU15 average. In all other analysed categories, SMEs in the Czech Republic are slightly above the NMS13 average and lag much behind their EU15 counterparts. The largest gaps between the Czech Republic and the EU15 occur in file storage, hosting of enterprise databases and CRM software usage.

**Figure 17**

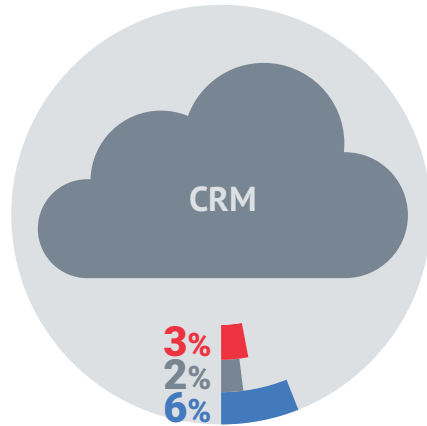
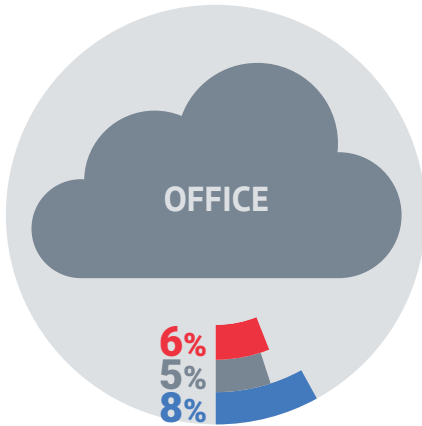
SMEs buying selected Cloud Computing services (%), 2014



EU15

NMS13

CZECH REPUBLIC



Source: DELab UW own calculations based on the data from Eurostat



# Conclusions

## What have we found?

- The Czech SMEs take a leading position in e-commerce (both B2B and B2C) with respect to other EU markets and they willingly adopt digital management tools. They are in a good position to make a breakthrough in their digital transformation as they benefit from fairly good digital infrastructure and a workforce with sufficient digital skills. Additionally, they provide training for employees to increase their digital skills.

## What are the challenges?

- The Czech SMEs seem to underestimate the business potential of some digital tools, particularly those of social media, CRM software and cloud computing. It may stem from the fact that they employ a relatively low number of ICT specialists and that a fair share of their workers report relatively low digital communication and software skills.

## What needs to be done?

- Make further improvement of digital infrastructure, particularly in the distribution of fast and cheap Internet access.
- Invest in training in communication and software skills for the workers.
- Enhance the usage of social media in SMEs for contacting customers and marketing.
- Continue adaptation of more advanced digital technologies, particularly in the area of cloud computing.
- Strengthen the development of e-commerce as a channel for international trade that is an important feature of the Czech economy.







Digital Economy Lab (DELab) is a research centre established in 2014 within the University of Warsaw to accelerate the development of digital economy and society by providing high-quality research on the impacts of digital transformation and innovation. By application of data science methods DELab examines how digital markets, skills and societies build smart economies, businesses and governance. We deliver policy recommendations on how to better meet the challenges of global digitalisation. Our studies promote entrepreneurship and enhance society's awareness of the benefits of digital transformation. DELab's interdisciplinary team consists of professors and young researchers from various academic backgrounds including economics, sociology, law, administration, IT, European integration, philosophy, political sciences, globalisation, management and entrepreneurship.

