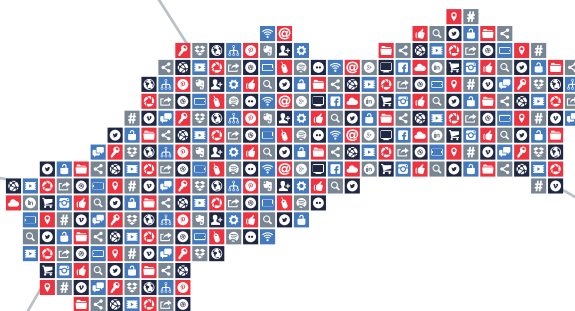


# Digital Transformation of Small and Medium Enterprises in the **SLOVAKIA**



DELab UW Country Report

May 2016

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Commissioned by Google

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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, Slovakia
- 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 Slovakia 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 Slovak SMEs ready to compete on the Digital Single Market?**

Our analysis shows that Slovak enterprises have access to a moderately well developed digital infrastructure and recognize the need to invest in training for their employees and ICT specialists. However, in terms of adoption of main digital technologies Slovak SMEs present a mixed performance: they take the regional lead in the usage of cloud computing services, but their uptake of social media and CRM is below the regional average. To reap the benefits of the Digital Single Market, the Slovak SMEs need to strengthen their engagement in cross-border e-commerce.

# 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

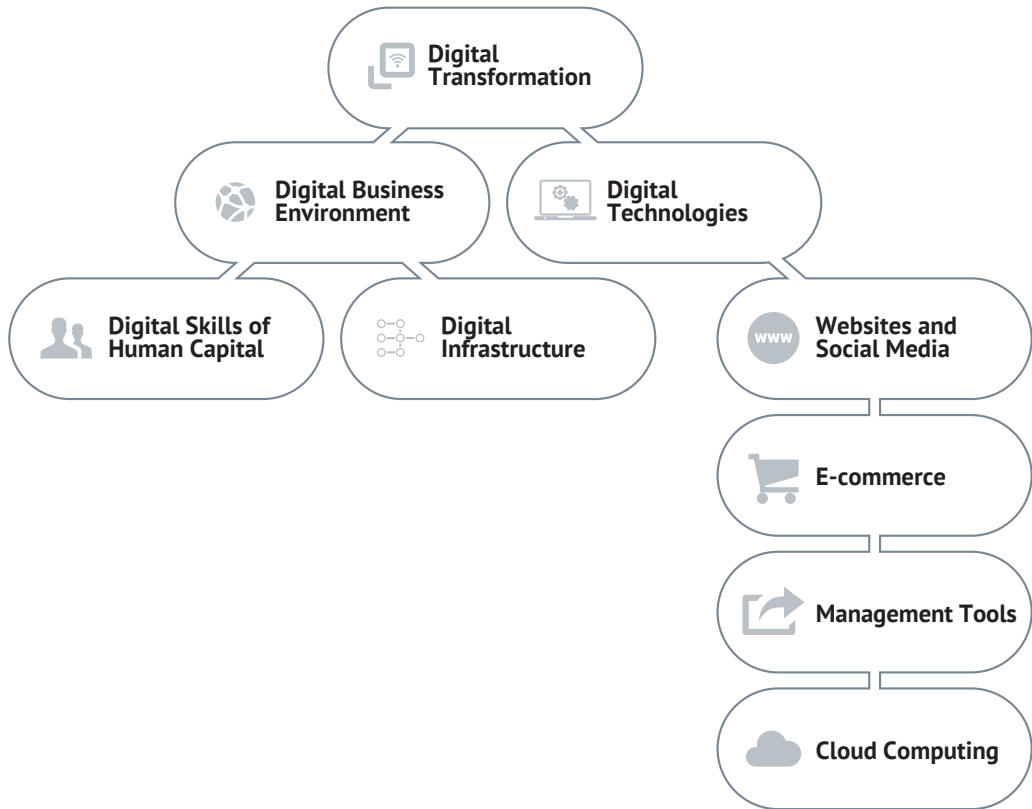
## **Digital infrastructure**

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.

# Slovakia in a Nutshell

## Key findings for SMEs in Slovakia

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- Increase digital skills of employees by organising training
- Broadly adopt cloud computing services
- Use websites intensively
- Engage in e-commerce in the domestic market



- Do not use social media
- Do not recruit ICT Specialists
- Do not use CRM software

## Slovakia in the EU28

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- 5<sup>th</sup> in mobile broadband coverage
- 6<sup>th</sup> in the usage of video calls
- 9<sup>th</sup> in e-commerce turnover
- 10<sup>th</sup> in cloud computing



- 16<sup>th</sup> in Human Capital
- 18<sup>th</sup> in Use of Internet
- 19<sup>th</sup> in Integration of Digital Technology
- 21<sup>st</sup> in Connectivity
- 26<sup>th</sup> in Digital Public Services



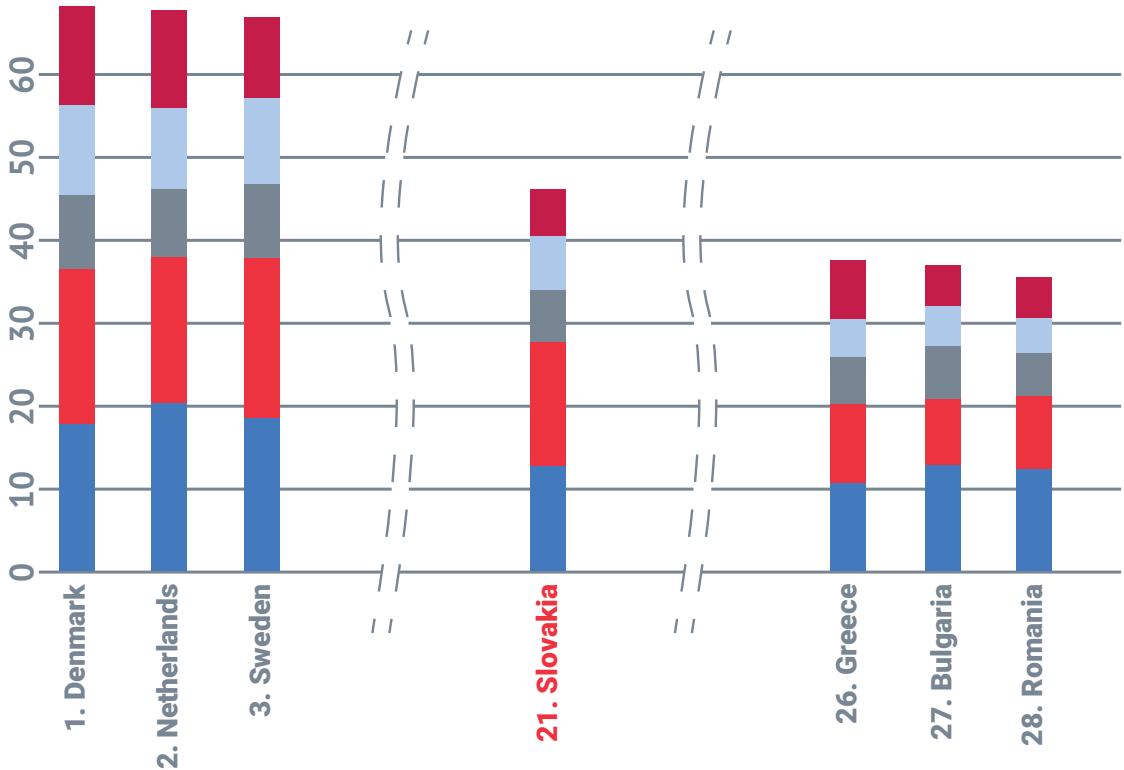
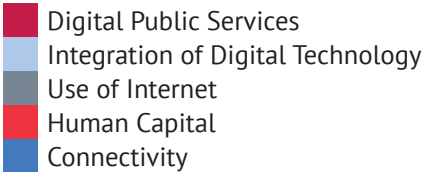
# Digital Map: Slovakia in the EU28

“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, Slovakia takes the 21<sup>st</sup> place in the EU, revealing considerable gaps with respect to other countries in several dimensions. A great obstacle for digital development is the poor performance in Connectivity (which measures the deployment of broadband infrastructure and its quality), in which Slovakia takes the 21<sup>st</sup> position. The biggest problem comes in the coverage of fixed broadband internet (86% of households), for which the country is the second worst in the EU.

In terms of Human Capital, which measures the level of digital skills of the society, Slovakia ranks 16<sup>th</sup>, mainly due to the low share of Internet users (17<sup>th</sup> position). In Use of Internet the country ranks 18<sup>th</sup>. While Slovaks are strong users of video calls (6<sup>th</sup> in the EU), they read news (23<sup>rd</sup> position) or use online banking (18<sup>th</sup> position) less intensively. Slovakia falls considerably behind other EU states in the area of online interaction between the public administration and citizens (26<sup>th</sup> place).

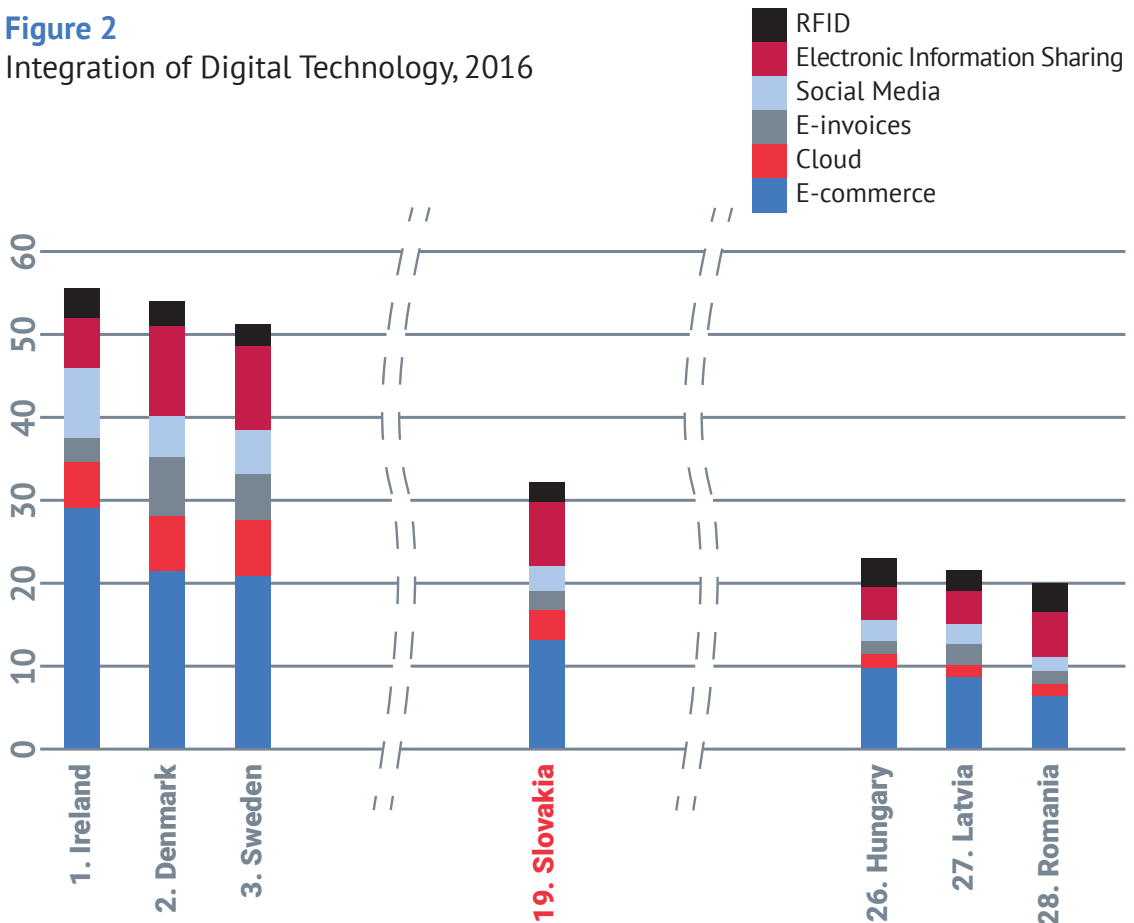
**Figure 1**  
DESI Index, 2016



Source: Digital Agenda for Europe, DESI

Integration of Digital Technology represents the level of digital transformation achieved by enterprises (with more than 10 employees), where Slovakia ranks 19<sup>th</sup> in the EU and shows a need for improvement in many sectors. More precisely, Slovak enterprises fall behind in the usage of RFID (20<sup>th</sup> place), in the usage of social media (19<sup>th</sup> place), in electronic information sharing services (i.e. management tools, like ERP), and in cross-border e-commerce (17<sup>th</sup> place in both categories). In terms of issuing e-invoices, Slovakia takes the 15<sup>th</sup> place among the EU countries. Remarkably, in cloud computing services Slovakia ranks 10<sup>th</sup>, which is the second best score among the NMS13, following Croatia. The other strength of Slovak enterprises is their relatively high score in e-commerce turnover, where they occupy the 9<sup>th</sup> place, which is the 4<sup>th</sup> best result among NMS13 countries.

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



Source: Digital Agenda for Europe, DESI



# Digital Business Environment for SMEs

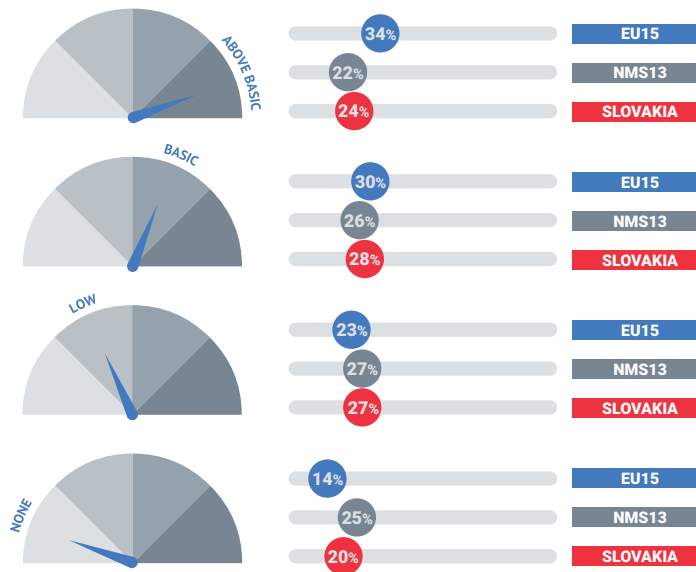
Digital Business Environment creates the common framework that enables SMEs to utilise digital technology and facilitates engagement of SMEs in the digital economy.

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 (also, but not exclusively ICT specialists) and we assess digital infrastructure by the access, affordability, speed and quality of the Internet.

# Digital Skills

More Slovaks report “basic” and “above basic” digital skills, than individuals in the NMS13, although they still lag behind the EU15 average. The gap is quite significant: while every third citizen from EU15 reports “above basic” skills, only every fourth Slovak reaches this level. The situation is similar with the share of population without digital skills; Slovakia outperforms the NMS13, but falls behind the EU15.

**Figure 3**  
Levels of digital skills amongst individuals (%), 2015

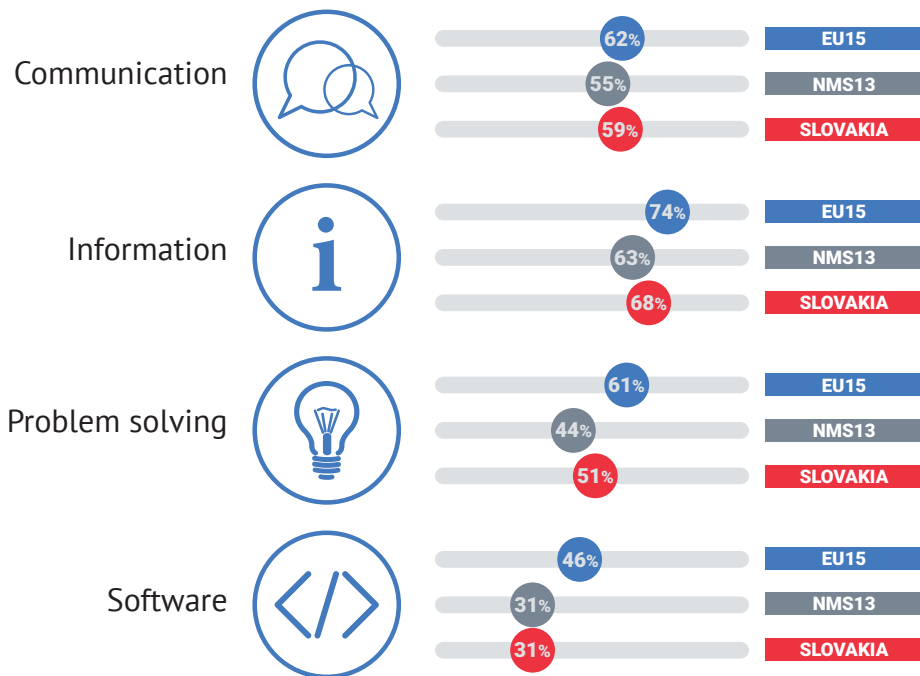


**Above basic skills** refer to the ability to carry out most of the tasks in all of four general categories (Communication, Information, Problem Solving and Software)  
**Basic skills** refer to the ability to carry out one specific task in each category  
**Low skills** refer to users who are unable 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

The advantage of Slovak workforce over NMS13 is noticeable in information, communication and problem solving skills. However, compared to the citizens of the EU15, Slovaks report relatively lower problem solving and software skills, which are valuable assets for enterprises.

**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

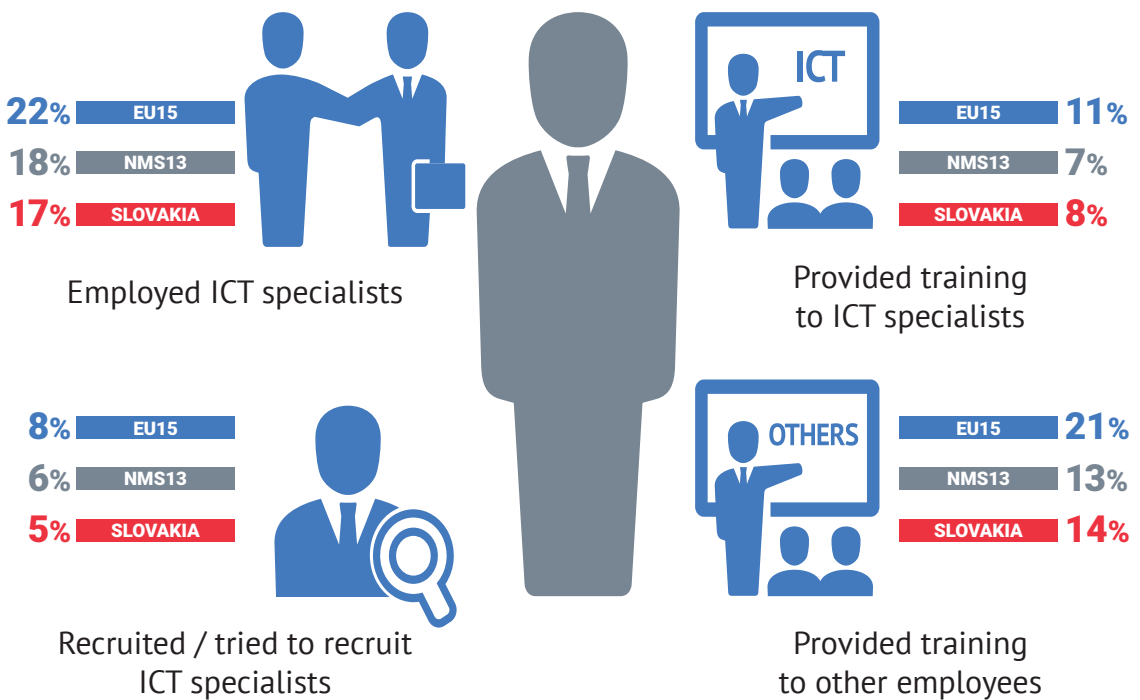
**Problem solving skills** represent the ability to manage files, change settings of software and use online services

**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

Slovak SMEs seem to be aware of the importance of digitally skilled employees. While Slovak SMEs lag behind both the NMS13 and the EU15 in terms of employment of ICT specialists, when it comes to ICT training for their employees, they rank slightly above the other NMS countries. However, EU15 SMEs are still more engaged in training, especially in the case of employees other than ICT specialists (21% vs 14% in Slovakia).

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



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



# Digital Infrastructure

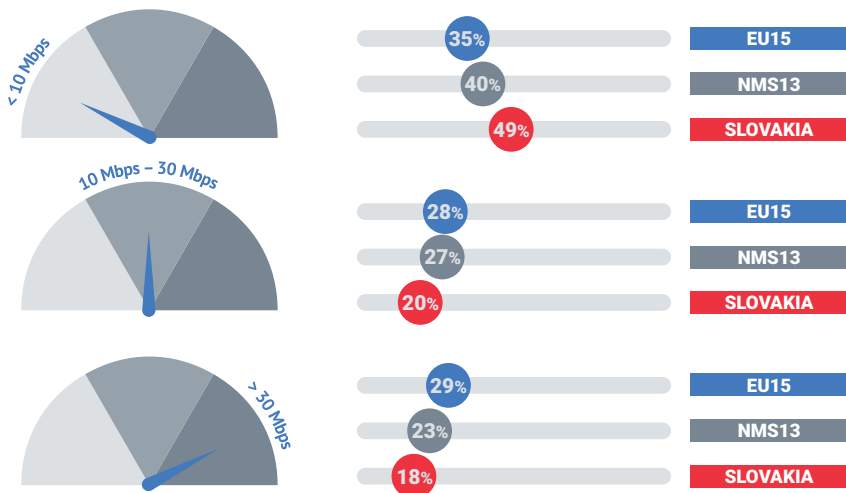
The access to high-speed Internet is the cornerstone of digital infrastructure. In Slovakia, the share of SMEs without Internet access (2%) is almost as low as in the EU15, therefore Slovak SMEs seem not to be constrained by Internet coverage.

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



However, the share of Slovak SMEs with low speed Internet connection (49%) is significantly higher than the EU15 average (35%), or even the NMS13 average (40%). Moreover, while in the EU15 every third SME has access to high-speed Internet, in Slovakia only every fifth does so.

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



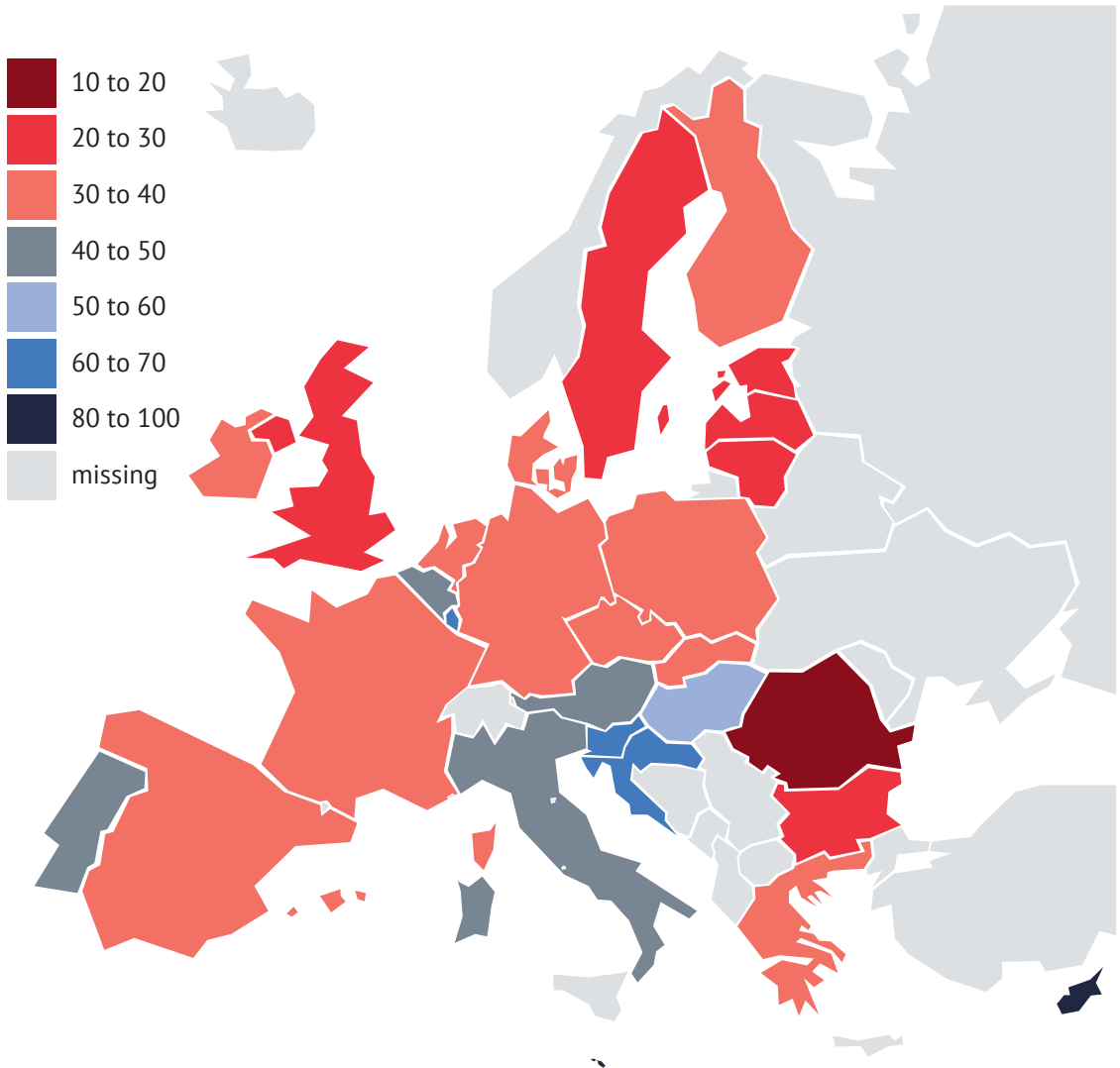
Source: DELab UW own calculations based on the data from Eurostat



In Slovakia, the median price of monthly subscription to high speed broadband (30.5 euros) is lower than in the EU15 (37 euros), as well as 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



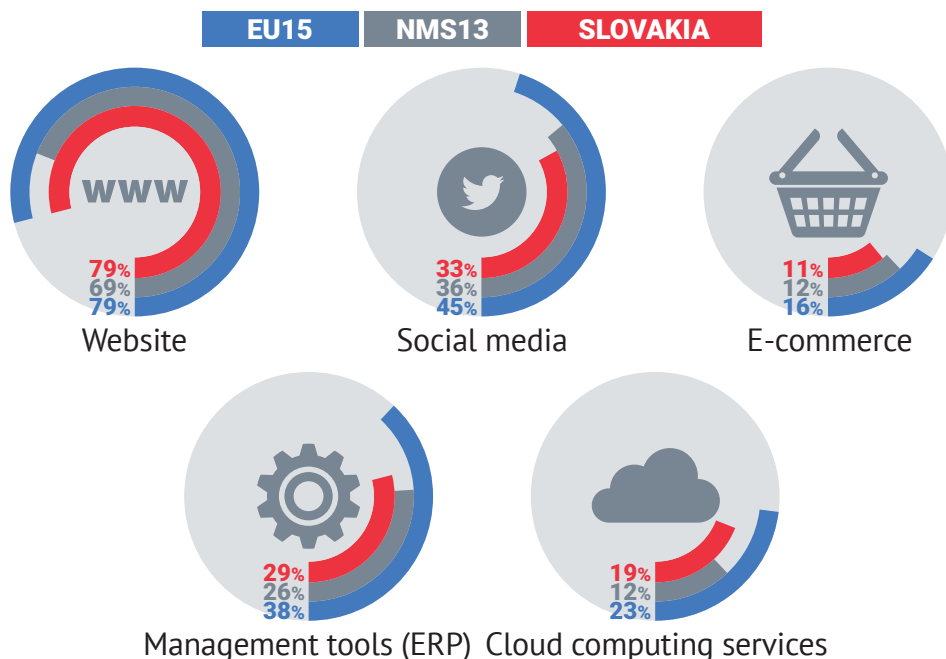
# Digital Technologies

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.

The share of Slovak SMEs that have a website or use cloud computing services is significantly above the NMS13 level and reaches the average level of the EU15. The use of ERP software is higher than the regional average, but considerably falls behind the EU15 average. Furthermore, less SMEs in Slovakia are engaged in e-commerce and social media than the average of NMS13 countries.

**Figure 9**

SMEs using main digital technologies (%), 2015



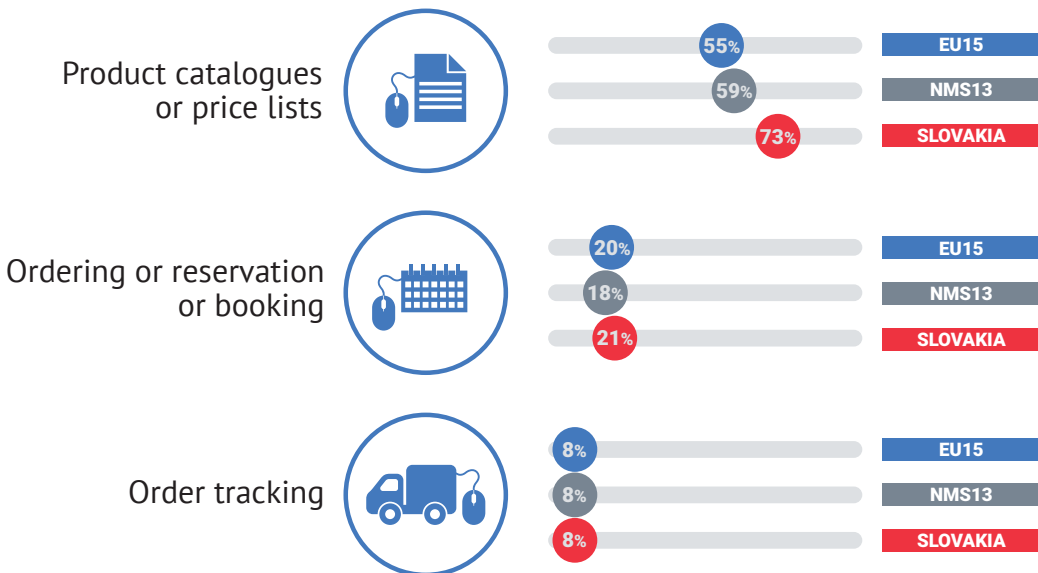
Source: DELab UW own calculations based on the data from Eurostat

# WWW Websites and Social Media

In Slovakia, 79% of SMEs have a website, which is similar to the EU15 average. Beyond standard features, such as providing product catalogues or price lists, they use online ordering, reservation or booking, and also offer a possibility for customers to track their orders slightly more often than SMEs in other EU countries.

**Figure 10**

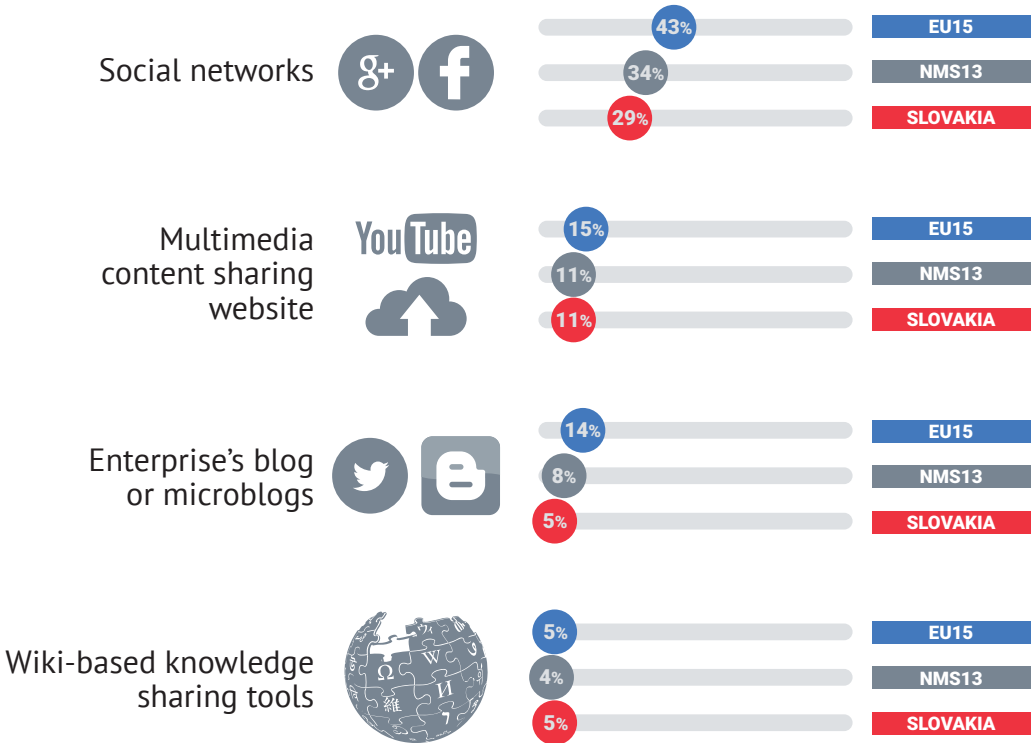
SMEs with websites providing selected services(%), 2015



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

Although social media and microblogs are powerful tools for marketing and communication, the share of enterprises in Slovakia using social media is relatively low compared to the EU15 (33% to 45%). The share of SMEs using social networks (e.g. Facebook), multimedia sharing sites (e.g. Youtube) and microblogs (e.g. Twitter) is significantly lower than the EU15 average. However, wiki-based knowledge sharing tools are utilized at similar levels to the EU15.

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

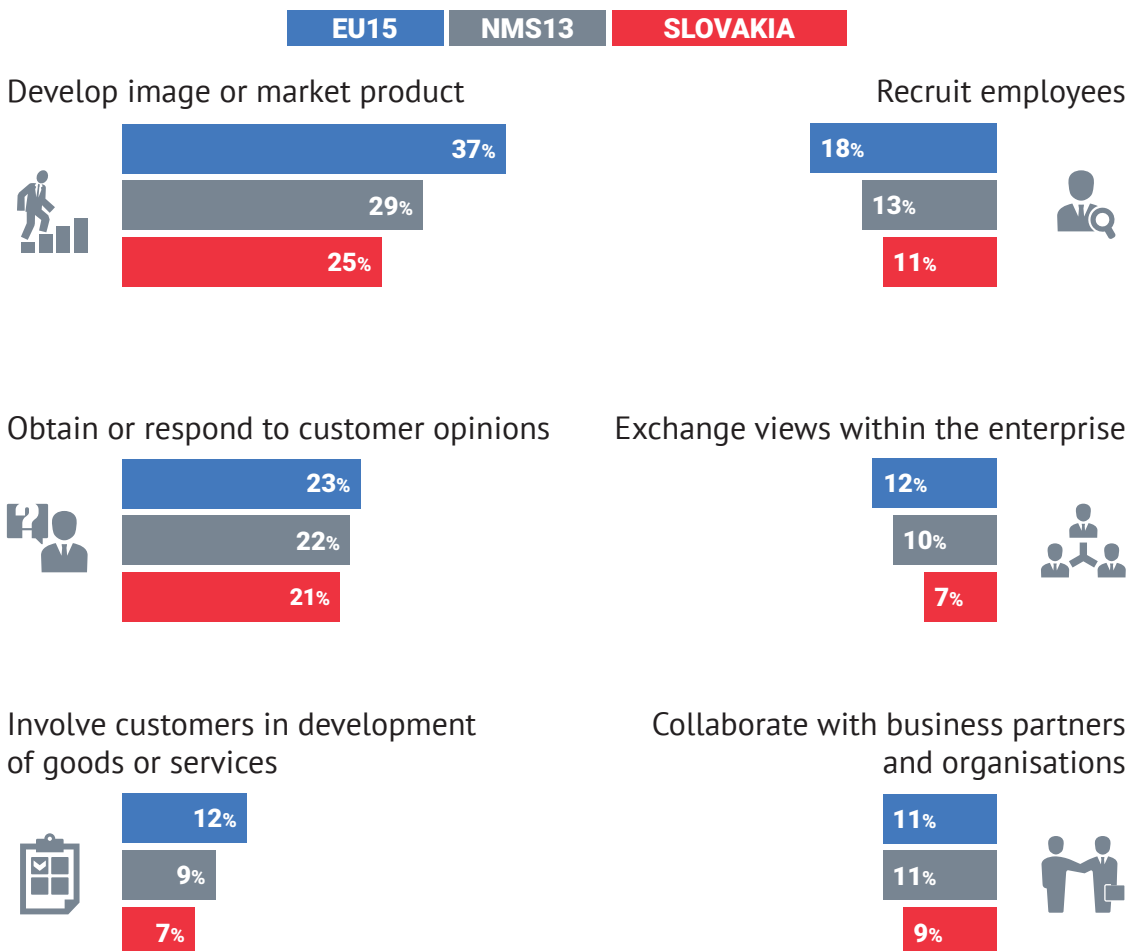


Source: DELab UW own calculations based on the data from Eurostat

Analysing the reasons for the usage of social media, Slovak SMEs reveal gaps in comparison to the rest of the EU in all analysed categories, which is mostly due to their overall low participation in social media. The difference is relatively small in the case of obtaining or responding to customer opinions (21% vs 23% in EU15), and in collaborating with business partners and organisations (9% vs 11% in EU15), while there is a large gap in recruiting employees (11% vs 18% in EU15), in exchanging views within the enterprise and in involving customers in development of goods and services (both: 7% vs 12% in EU15). In case of developing image or market products, which is the most popular usage, every fourth Slovak SME uses social media, which is under the average EU15 share (every third firm).

**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

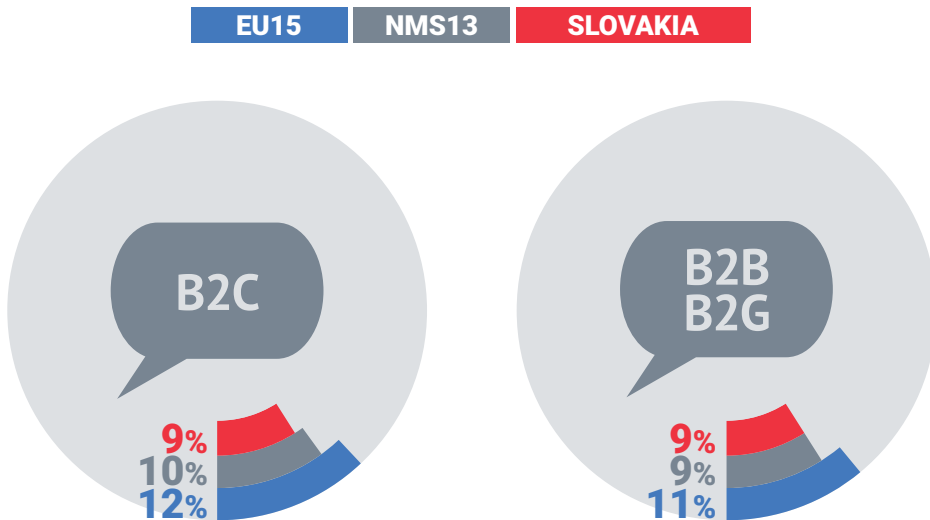
**Business to Business (B2B)** refers to sales to other enterprises

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

Slovak SMEs are relatively less engaged in e-commerce: 11% sell via websites or apps, while the EU15 average is 16%. The same is true for Slovak customers: 61% of individuals shop online, while the EU average is 65% (Eurostat). The same share of firms sell online for B2C (9% of SMEs) as for B2B and B2G (also around 9%).

**Figure 13**

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

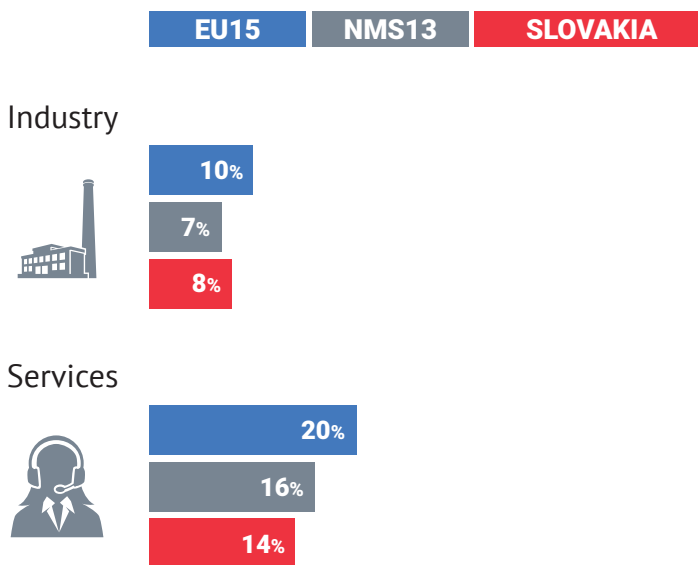


Source: DELab UW own calculations based on the data from Eurostat

Analysing sectorial data, the gap between Slovak and EU15 SMEs is narrower in case of industries (8% vs 10% in the EU15), than in case of services (14% vs 20%). E-commerce via website or apps is particularly popular among Slovak enterprises that deal with the repair of computers (94% in comparison to 20% in the EU15), as well as among travel agencies (61%) or in the telecommunications sector (32%).

### Figure 14

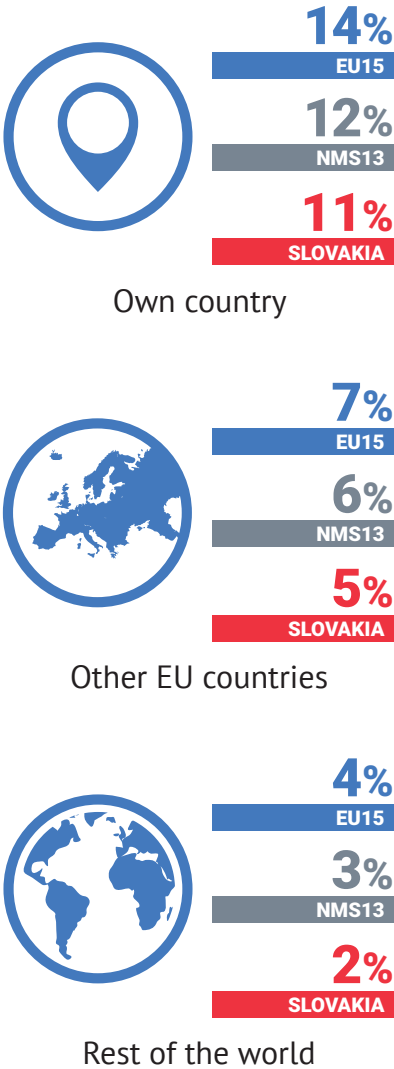
SMEs selling via a website or apps, according to sectors (%), 2015



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

Slovak SMEs engaged in e-commerce mainly focus on the domestic market. However, they are less active in the area of cross-border e-commerce, lagging behind their regional and EU15 rivals, especially in serving 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.

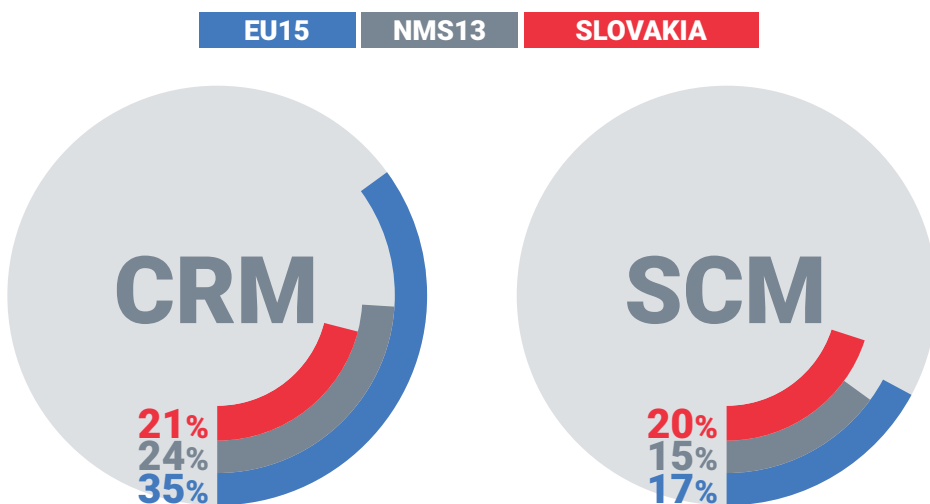
**Supply Chain Management (SCM)** means exchanging all types of information with suppliers and/or customers about the availability, production, development and distribution of goods or services.

**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.

SMEs in Slovakia make relatively intensive use of electronic information sharing technologies for the management processes within the company. The usage of ERP software is above the NMS13 level (29%), however Slovak SMEs still need to bridge the gap with the EU15 (38%). Furthermore, Slovak SMEs underperform with respect to the other EU countries in the usage of CRM software – only every fifth Slovak SME is using CRM software, compared to every fourth in the NMS13 and every third in the EU15. On the other hand, Slovak enterprises outperform both the NMS13 and the EU15 in supply chain management with SCM solutions. This supports the high digitisation of Slovak industries.

**Figure 16**

SMEs using CRM and SCM software (%), 2015



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



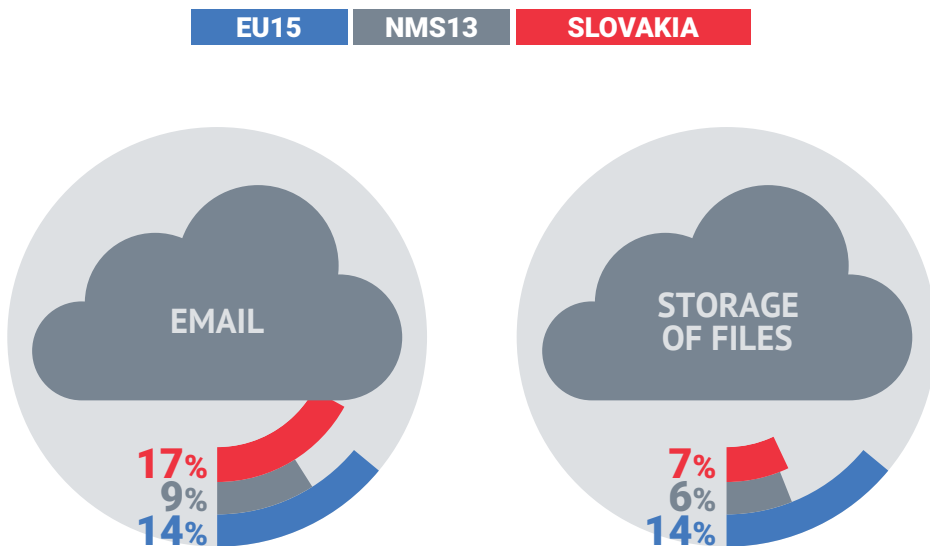
# Cloud Computing

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

In Slovakia, the share of enterprises that adopt cloud computing is much higher than the one in the NMS13. Moreover, Slovak SMEs outperform the EU15 average in terms of using cloud computing based e-mail, finance or accounting applications and office services (e.g. Google Docs). They share of SMEs that use computing power as a CC service is also very close to the average level in the EU15.

**Figure 17**

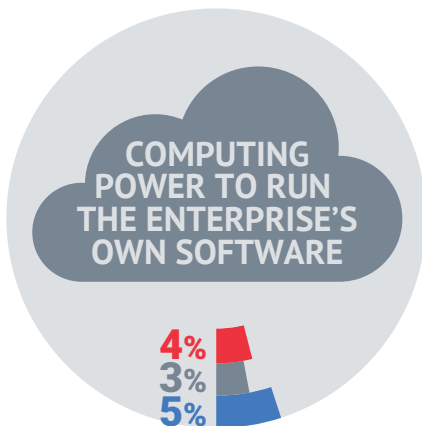
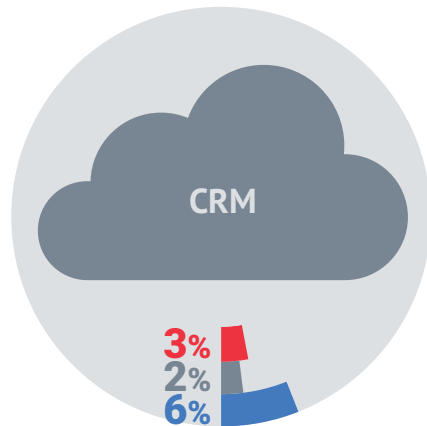
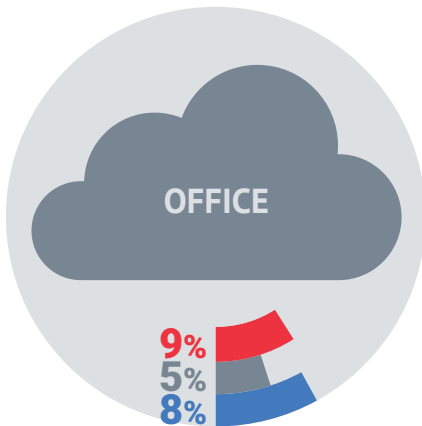
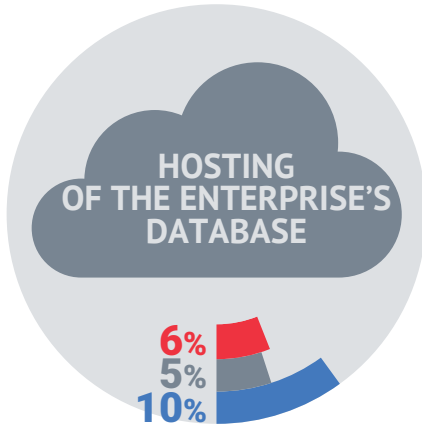
SMEs buying selected Cloud Computing services (%), 2014



EU15

NMS13

SLOVAKIA



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



# Conclusions

## What have we found?

- In many aspects the SMEs in Slovakia have taken the right path to digital transformation. They perform much better than their regional counterparts in terms of the adoption of cloud computing, make effective use of web site functionalities and recognize the need to invest in the ICT skills for their employees.

## What are the challenges?

- The digital infrastructure in Slovakia, although moderately well developed, needs further improvement: the fixed broadband is offered at a competitive price, but its coverage is limited. Only every fourth Slovak has above basic digital skills, which might be concerning in the perspective of the career development or running a business. Moreover, the digital skills of the Slovak workforce in the area of problem solving and software skills are considerably lower than that of the average EU15 workforce. SMEs in Slovakia do not make full use of social media and CRM, and their engagement in e-commerce, particularly cross-border, is much lower than the regional and EU15 average.

## What needs to be done?

- Improve Internet infrastructure by providing better access to fast broadband Internet.
- Boost digital skills of employees, especially in the software and problem-solving dimensions.
- Strengthen e-leadership of the Slovak SMEs by providing training to the entrepreneurs focusing on the business benefits of adoption of e-commerce tools.
- Encourage SMEs to more active use of social media, especially for building relations with their customers.







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.

