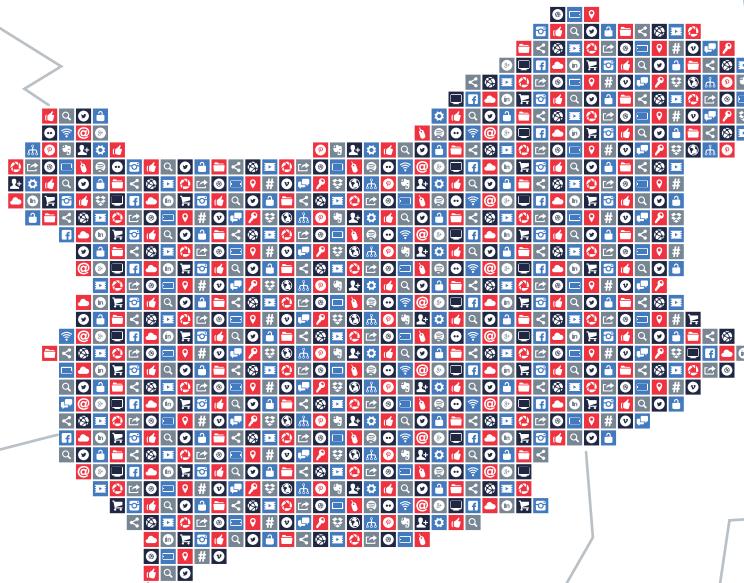


Digital Transformation of Small and Medium Enterprises in **BULGARIA**



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
- 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 Bulgaria in comparison to SMEs from other EU countries. We take into consideration both digital business environment (digital infrastructure such as Internet availability and digital skills of human capital) and adoption of digital technologies. 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 by European Commission within the DSM framework greatly enhance the opportunities stemming from successful digital transformation, as well as pose risks connected with losing markets and customers due to digital business incompetence. 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 Bulgarian SMEs ready to compete in the Digital Single Market?

Our analysis suggests that Bulgarian enterprises do not use the opportunities offered by digital transformation, performing worse than their regional counterparts. Although they benefit from access to relatively good digital infrastructure, they lag behind in the adoption of digital technologies, especially in the area of e-commerce and cloud computing services. The most important obstacle to their digital takeover is the very low level of digital skills of the human capital. Bulgarian SMEs are trying to cope by hiring ICT specialists, but at the same time they do not invest in ICT training of their employees. As a result, according to the indicators measuring digital transformation of economy and society (DESI), the country takes the second to last place among the EU28 (27th).

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

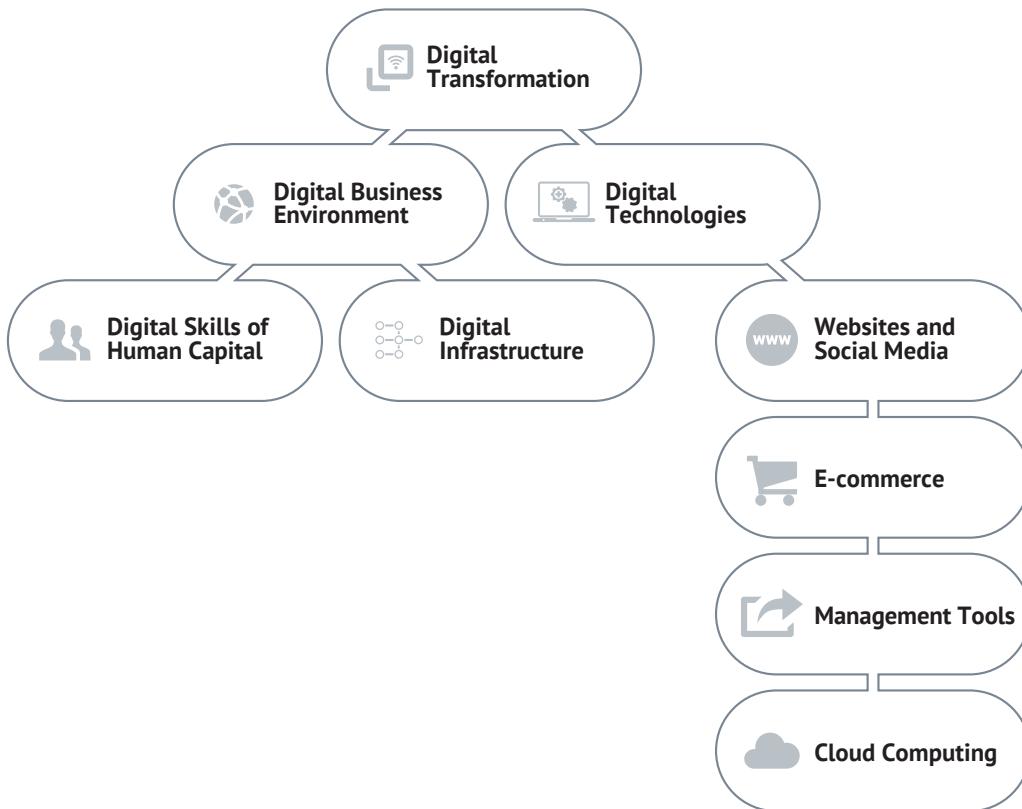
Digital infrastructure

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.

Bulgaria in a Nutshell

Key findings for SMEs in Bulgaria



- Subscribe to high-speed Internet
- Employ a high number of ICT specialists
- Use advanced functions on their websites (such as order tracking)
- Use social media to collaborate with partners
- Implement SCM solutions



- Lag behind the rest of the EU in the adoption of digital technology
- Are less engaged in e-commerce, especially in the service sector
- Do not invest in upgrading ICT related skills of their employees

Bulgaria in the EU28



- 1st in the usage of video calls
- 6th in the usage of social networks by individuals



- 19th in the Use of Internet
- 22nd in Connectivity
- 23rd in the Integration of Digital Technology
- 28th in Human Capital
- 28th in Digital Public Services



Digital Map: Bulgaria in the EU28

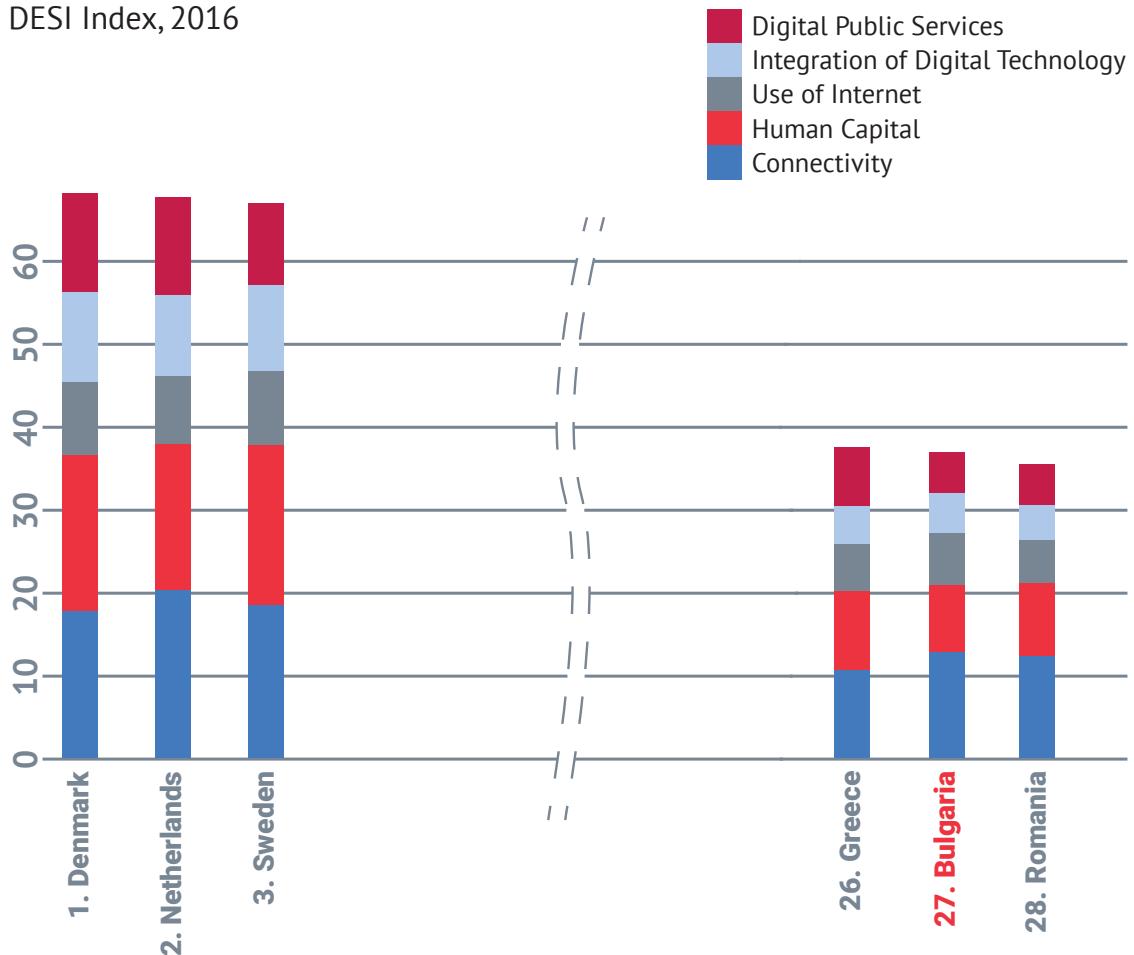
“Digital Economy and Society Index” (DESI) measures the degree of digital transformation of the EU member states. Namely, the index reports the level of development in the following categories: access, speed and quality of Internet infrastructure (represented by “Connectivity”), digital skills of society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

According to the DESI Index, Bulgaria takes the second to last position among the EU28. The biggest challenge can be observed in Human Capital, where Bulgaria occupies the last position in the EU. Bulgarians are second to last when it comes to the share of Internet users (only 55% of individuals aged 16-74 use Internet), the share of individuals with basic digital skills (31%), and the share of ICT specialists (1.9% of total employees).



The DESI Index reveals that digital development in Bulgaria is almost at the lowest level in all examined dimensions. The country is characterised by poor performance in Connectivity (which measures the deployment of broadband infrastructure and its quality), taking the 22nd place among the EU countries. The main challenge is the low number of subscriptions to the fixed broadband Internet. However, Bulgarian Internet users are engaged in various online services: often make video calls (1st position in the EU) and explore the social media (6th position), although there is much to improve in online shopping and online banking (second to last and last position, respectively). As far as Digital Public Services are concerned, Bulgaria is in the worst position among the EU28.

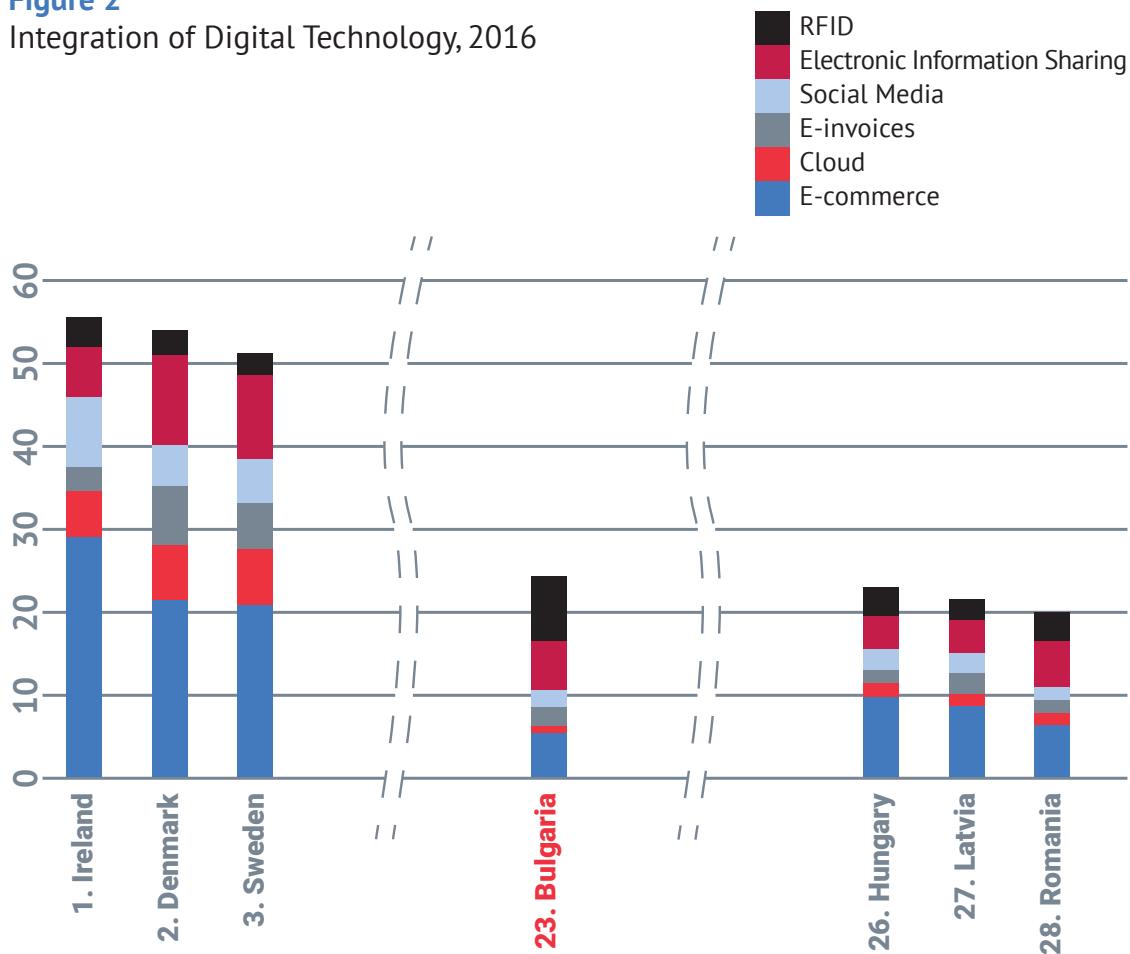
Figure 1
DESI Index, 2016



Source: Digital Agenda for Europe, DESI

Integration of Digital Technology represents the level of digital transformation achieved by business. It measures the adoption of digital tools, like cloud computing services or the engagement in e-commerce. In terms of uptake of digital technologies, Bulgaria occupies the 23rd place in the EU. Bulgaria is in the last position for e-commerce – both in terms of the share of turnover and in participation in cross-border selling. Bulgarian SMEs also fall behind through their poor performance in social media usage (26th place), electronic information sharing (management tools, such as ERP – 22nd); e-invoices and cloud computing services (21st and 28th position, respectively). However, Bulgarian SMEs are the number one in implementing radio-frequency identification (RFID) among the EU28.

Figure 2
Integration of Digital Technology, 2016



Source: Digital Agenda for Europe, DESI



Digital Business Environment for SMEs

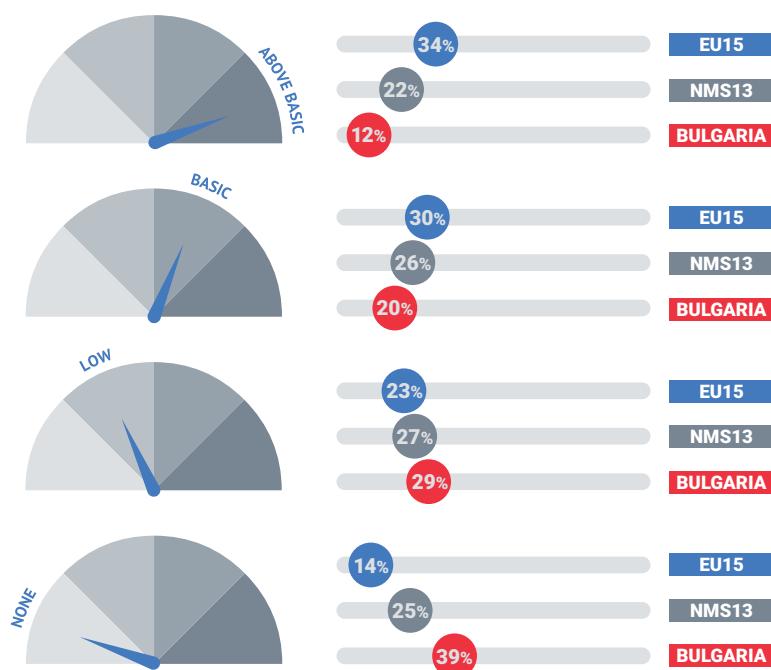
Digital Business Environment creates the common framework that enables SMEs to utilise digital technology and facilitates engagement of SMEs in the digital economy.

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

Bulgarians show a great gap in digital skills in comparison to the rest of the EU, lagging behind the other NMS countries as well. The share of individuals reporting “above basic” skills is very low - one in ten people has more advanced digital skills, while in the EU15, it is one in three. Furthermore, nearly 40% of Bulgarians have “no” digital skills.

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

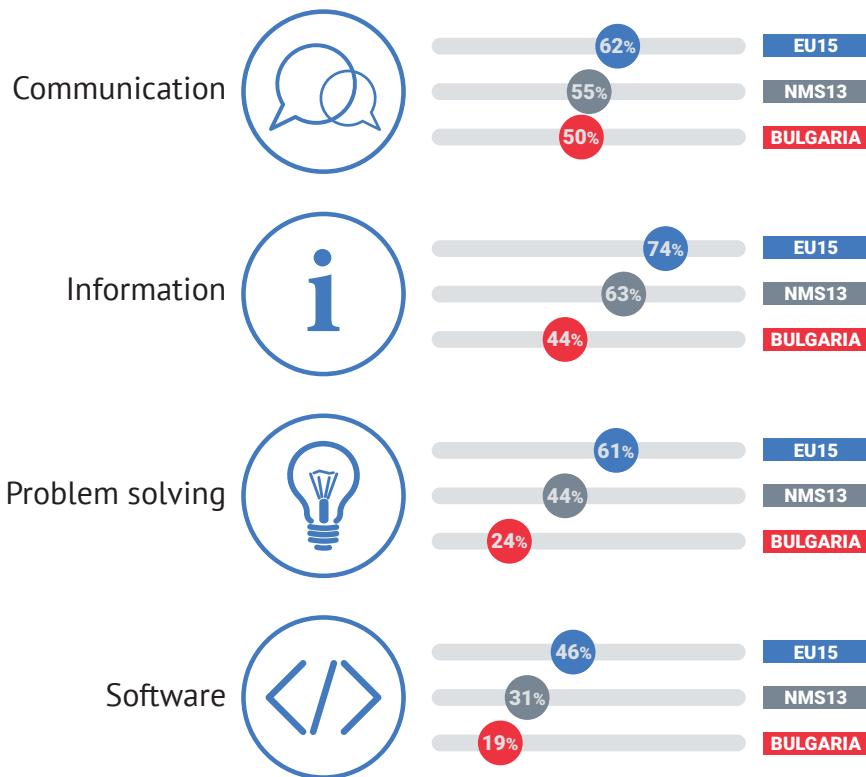


Above basic skills refer to the ability to carry out most of the tasks in all of four general categories (Communication, Information, Problem Solving and Software)
Basic skills refer to the ability to carry out one specific task in each category
Low skills refer to users who are unable to perform any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

Analysing the share of individuals reporting specific skills at “above basic” level, one can see that Bulgarians have strikingly low levels in problem solving skills (24% of individuals, while the EU15 average is 61%) and in software skills (19% of individuals compared to 46% in the EU15). To reinforce these abilities would be an especially valuable asset 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

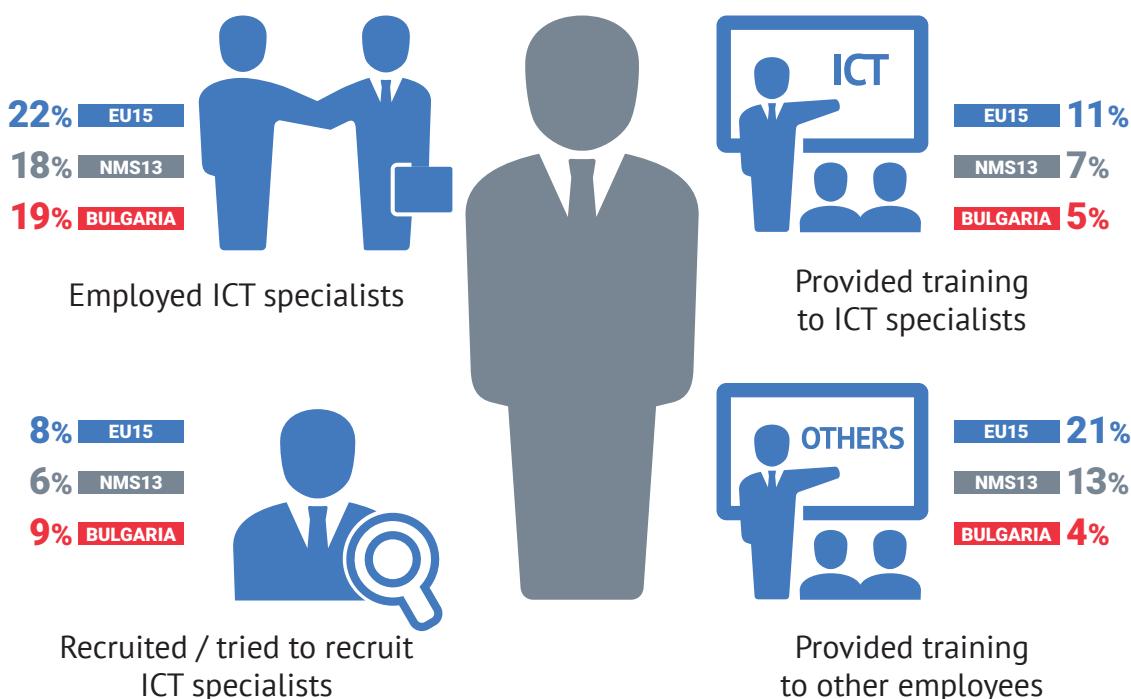
Problem solving skills represent the ability to manage files, change settings of software and use online services

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

Bulgarian SMEs seem to be aware of the importance of digitally skilled employees. They employ a high share of ICT specialists and they also willingly look for new digitally skilled candidates. On the other hand, they do not invest in training to upgrade the digital skills of their employees (ICT specialists but not only) and lag behind the EU15 average in this respect. At the same time, the demand for highly-skilled ICT specialists is growing.

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



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

Digital Infrastructure

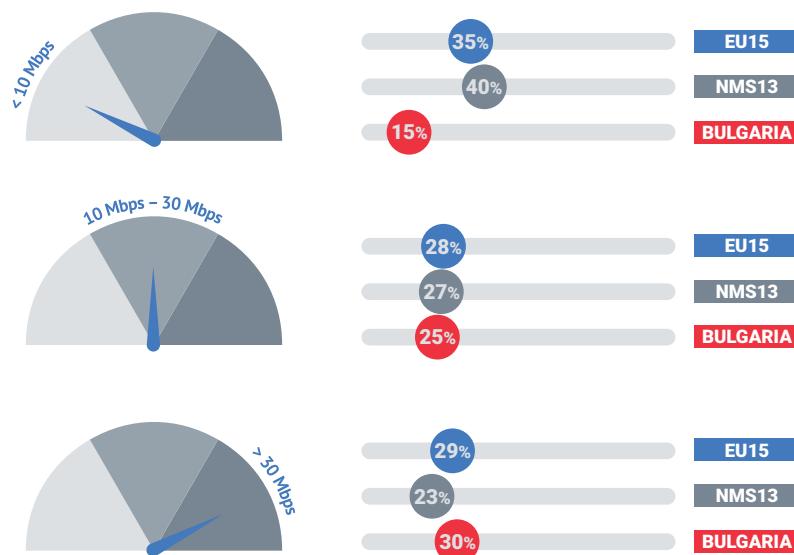
The access to high-speed Internet should be the cornerstone of digital infrastructure. In Bulgaria, this is an additional weak point of the digital ecosystem, holding back the potential of the SMEs. Furthermore, 9% of them have no access at all to the Internet (EU15 average is only 2%).

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



On the other hand, SMEs mainly use high and medium-speed connections. The share of enterprises with a high-speed Internet connection (above 30 Mbps) amounts to 31%, exceeding not only the regional, but also the EU15 level (29%).

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

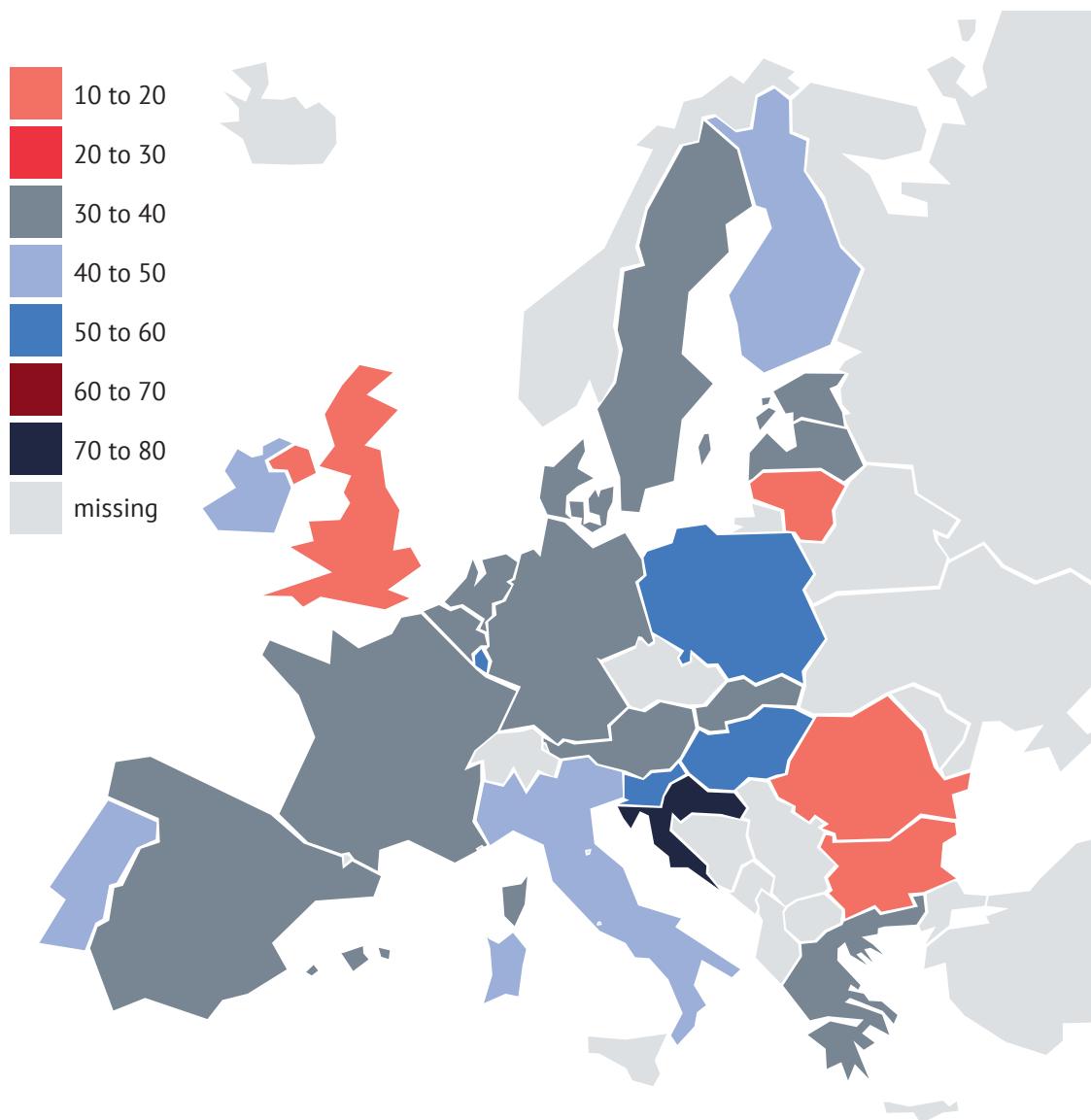


Source: DELab UW own calculations based on the data from Eurostat

The significantly lower cost of high-speed Internet access may explain this relatively high uptake of fast Internet connections: the median price of a monthly subscription in Bulgaria amounts to 29 euros which is one of the lowest among all the EU member states.

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

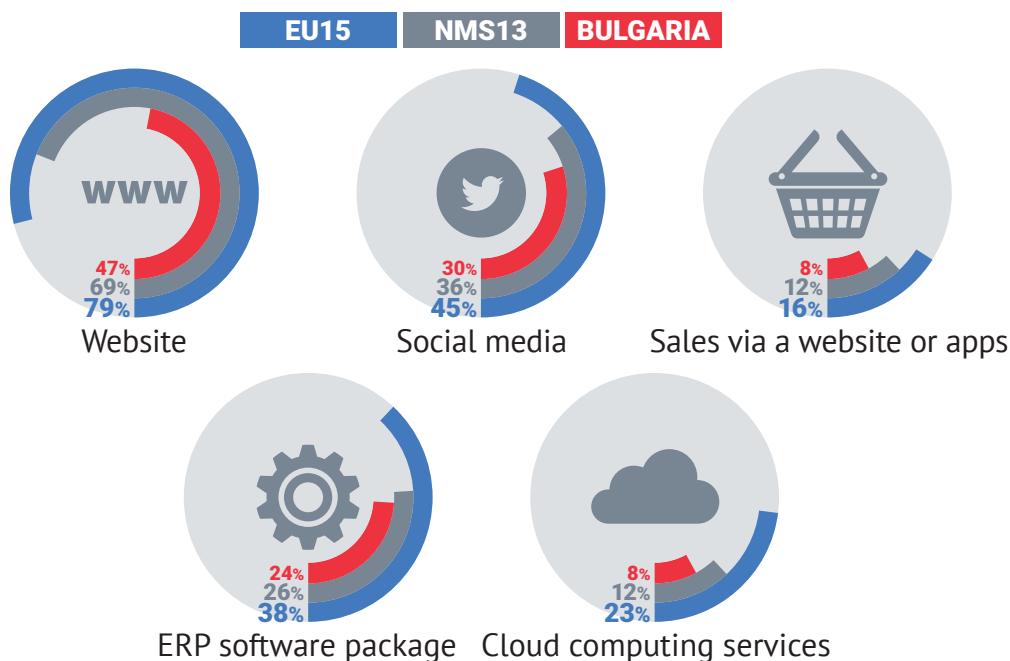


Digital Technologies

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, Bulgarian SMEs significantly lag behind in the uptake of all analysed digital technologies. Only one in two Bulgarian SMEs has a website, while four in five SMEs have one in the EU15. Additionally, the share of SMEs using cloud computing services, social media or management tools is below the NMS13 average. Bulgarian enterprises have to increase their efforts to catch up with the rest of the EU in order to remain competitive in the global digital economy.

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

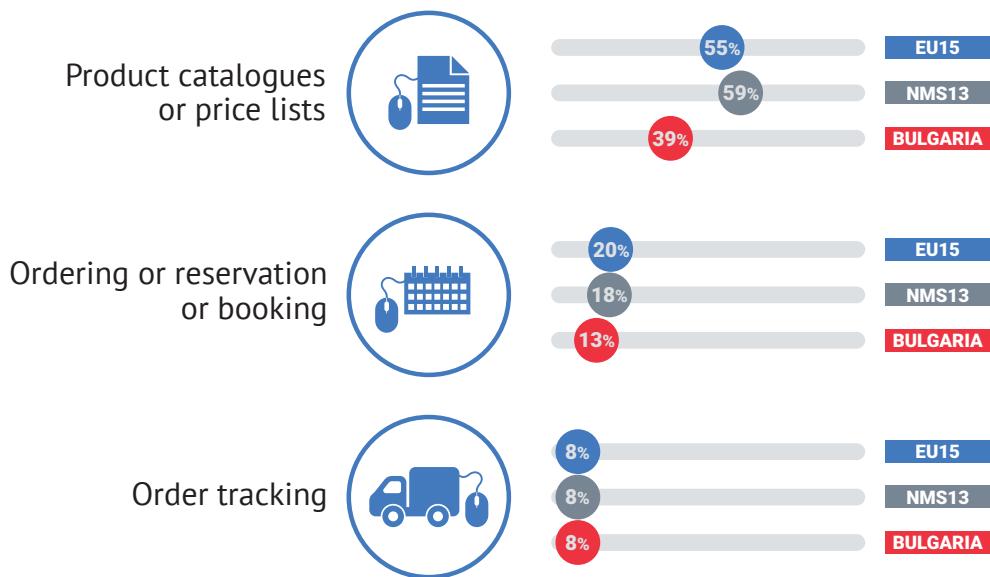


Source: DELab UW own calculations based on the data from Eurostat

WWW Websites and Social Media

Bulgarian SMEs which do have websites provide similar services as enterprises in the other EU countries. They mainly use their websites to provide information about products and prices. However, the share of SMEs in Bulgaria that provide the information about products and prices is significantly lower than in the rest of the EU. Although in the more advanced services (such as order tracking) Bulgarian enterprises perform similarly to the rest of the EU.

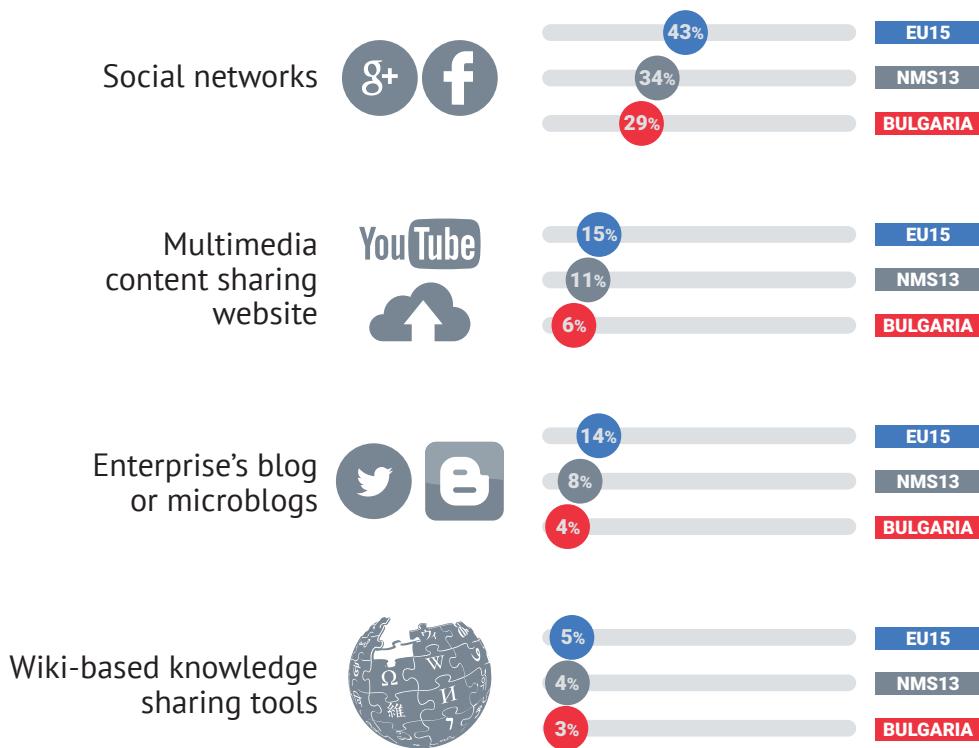
Figure 10
SMEs with websites providing selected services(%), 2015



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

While social media and microblogs represent powerful tools for marketing and communication purposes, the share of enterprises using social networks is relatively low in Bulgaria (29% against 43% in the EU15). Furthermore, their uptake of social media services in all selected categories in Bulgaria is two or three times less than the average performance of enterprises in the EU15.

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

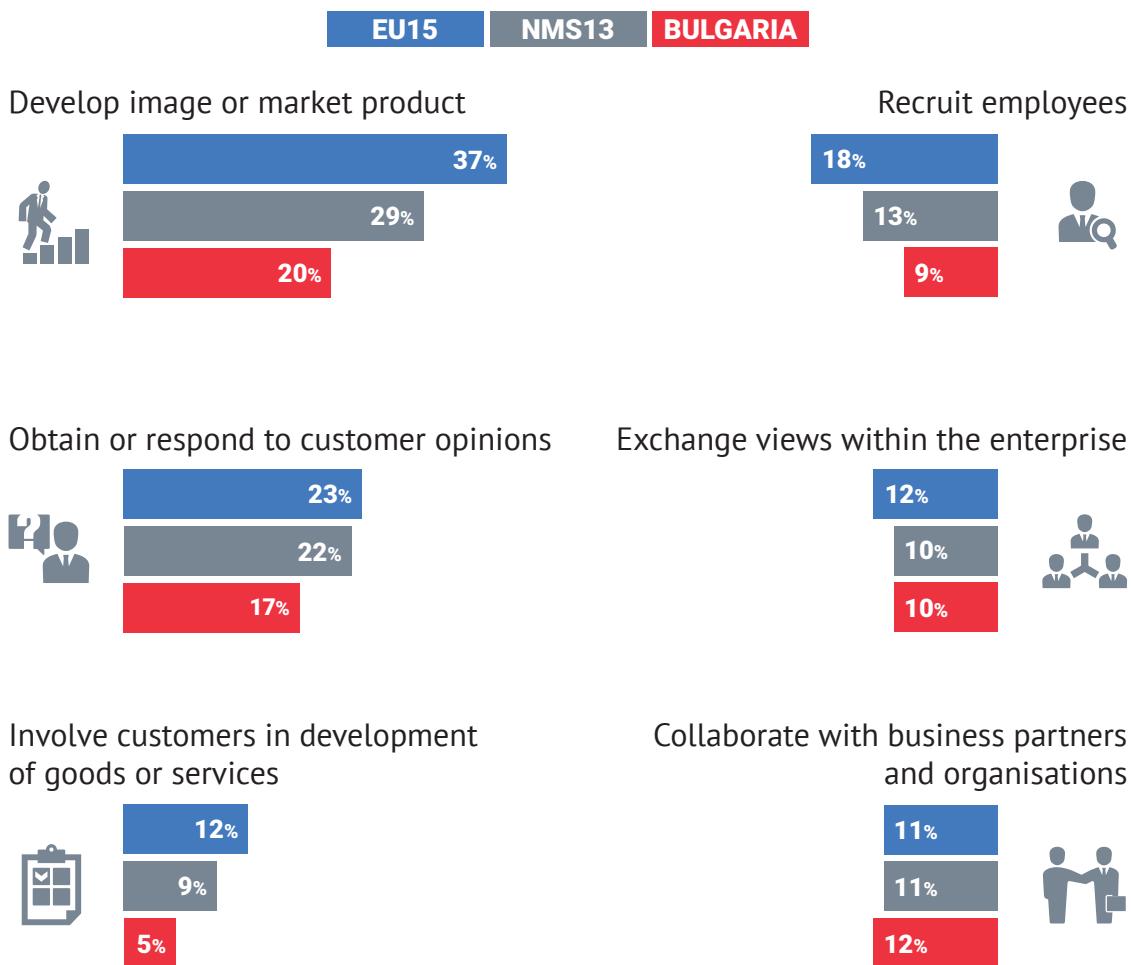


Source: DELab UW own calculations based on the data from Eurostat

Bulgarian SMEs use social media for the same reasons as enterprises from the other EU countries: mainly for brand building and communicating with customers. However, the share of enterprises that use social media for marketing purposes is significantly lower than in the EU15. That being said, SMEs in Bulgaria are more active in collaborating with business partners via social media.

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

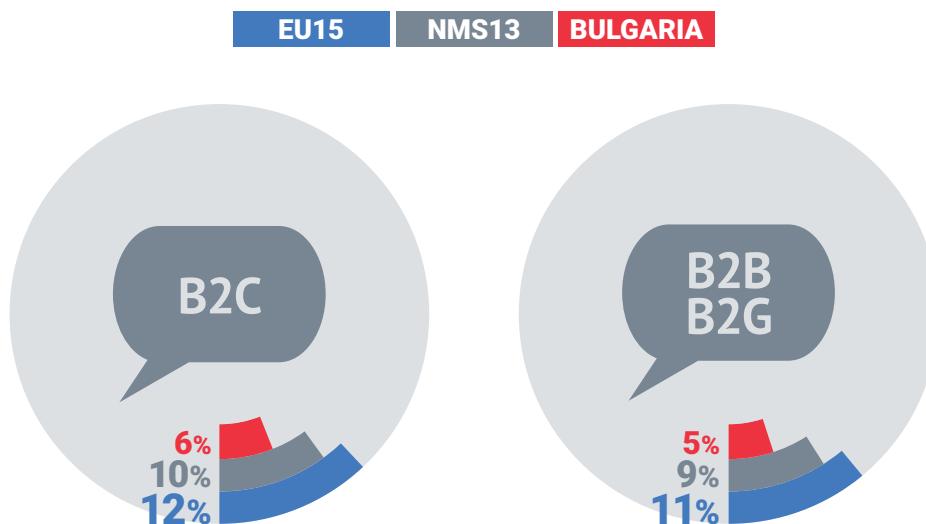
Business to Business (B2B) refers to sales to other enterprises

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

Overall, only less than 8% of Bulgarian SMEs are engaged in sales via websites or apps, which is the second lowest result in the EU. The share of SMEs involved in sales to private consumers (B2C), or in sales to other enterprises (B2B) and public authorities (B2G) is around twice smaller than the average for the EU15.

Figure 13

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

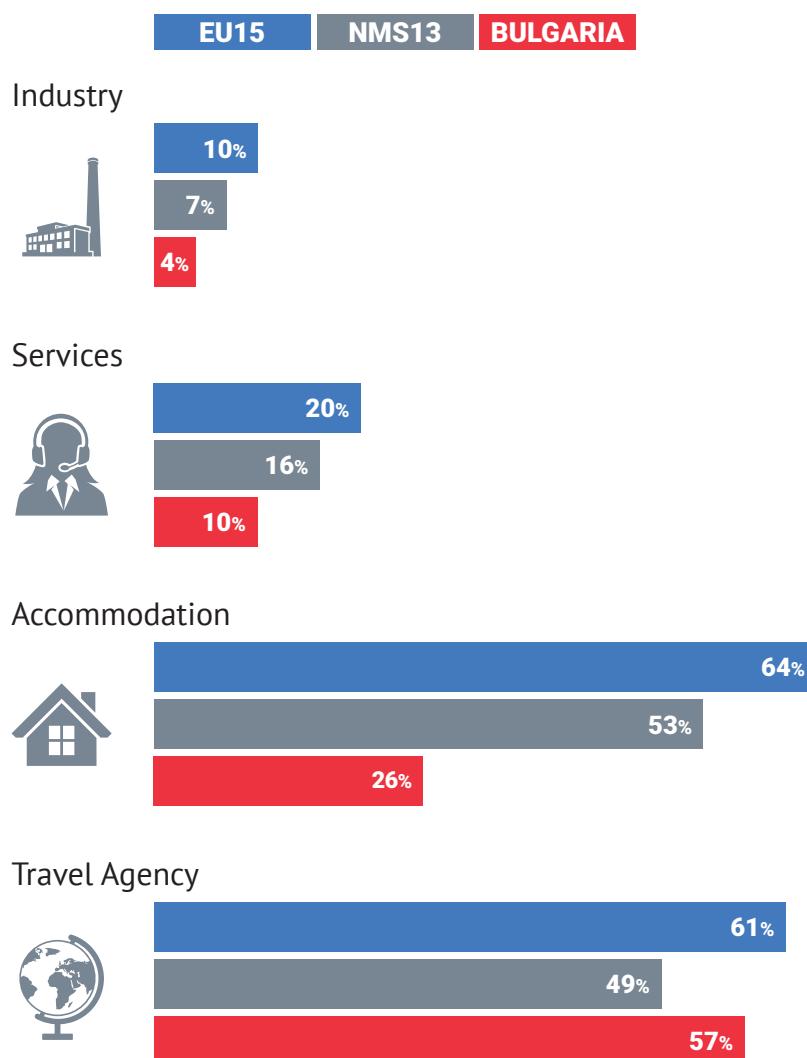


Source: DELab UW own calculations based on the data from Eurostat

Analysing the sectors, the gap between Bulgaria and the EU15 seems to be as high in services as in industry. When planning to stay in the country, it can be difficult to find a room via a website, as Bulgaria lags significantly behind the EU countries in terms of providing accommodation services online (26% versus 53% in the NMS and 64% in the EU15). This is surprising given the relatively important role of tourism in Bulgaria.

Figure 14

Enterprises (10+ employees) selling via a website or apps, according to sectors (%), 2015

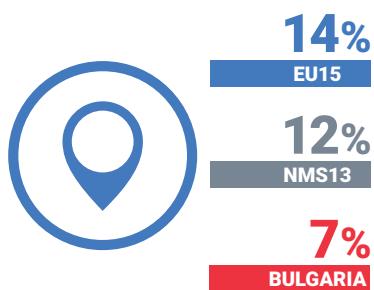


Source: DELab UW own calculations based on the data from Eurostat

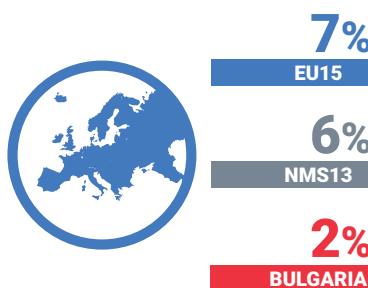
The small amount of online sales are mostly concentrated within the country. Bulgarian SMEs are much less engaged in cross-border e-commerce than their counterparts in the rest of the EU: less than 3% of SMEs serve the markets of other EU countries, and less than 2% outside the EU.

Figure 15

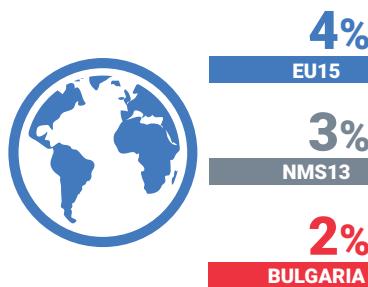
SMEs engaged in electronic sales (%), 2015



Own country



Other EU countries



Rest of the world

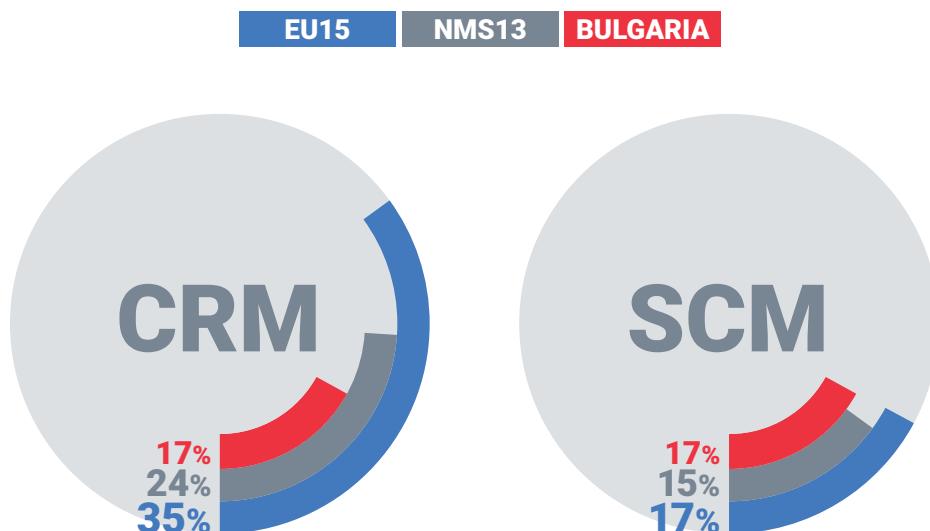
Source: DELab UW own calculations based on the data from Eurostat

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 Bulgaria make little use of digital management technologies for the management of processes within the company. The usage of ERP software is much less common in Bulgaria (24%) than in the EU15 (38%). However, SCM is used at the EU15 level (17%), which suggests that Bulgarian small and medium-sized enterprises are well integrated within the supply chains. On the other hand, the CRM software is significantly less frequently used in Bulgaria.

Figure 16
SMEs using CRM and SCM software (%), 2015



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

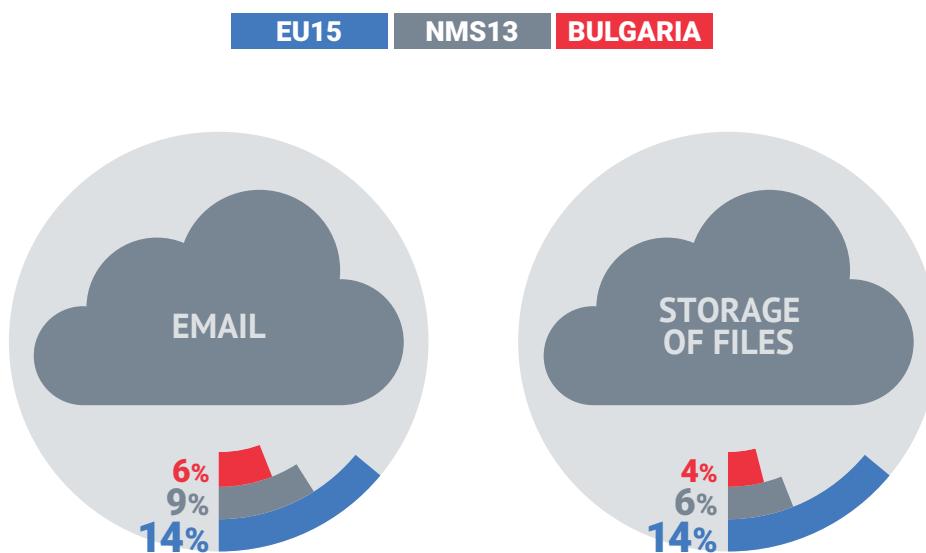
Cloud Computing

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

SMEs in Bulgaria reveal a much lower adoption of Cloud Computing services in all examined services than the NMS13 average. The most considerable gap is in the usage of computing power, storage files and CRM software. SMEs in the EU15 use five times more computing power CC services and three times more CC storage for files or CRM than SMEs in Bulgaria. Bulgarian SMEs usage of business e-mail, cloud-based office services (like Google Docs), finance/accounting applications, and hosting for the enterprise's database is twice less than in the EU15.

Figure 17

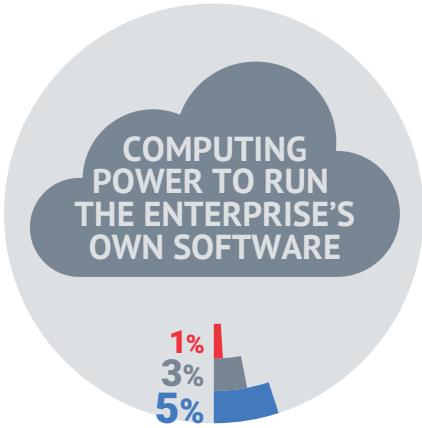
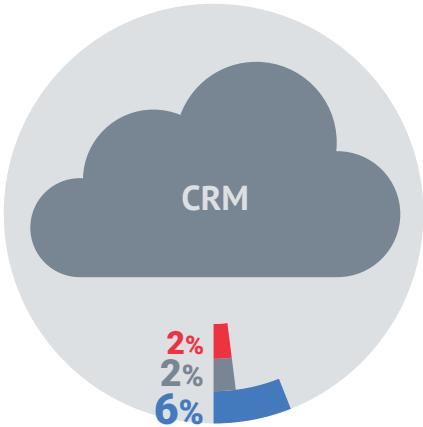
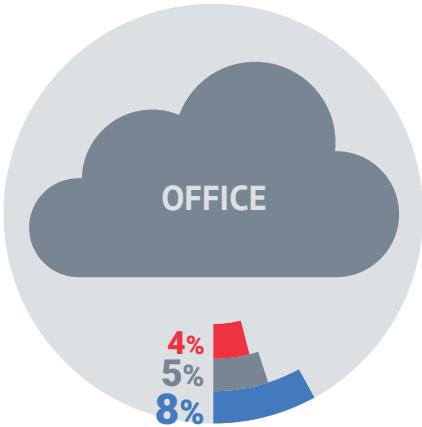
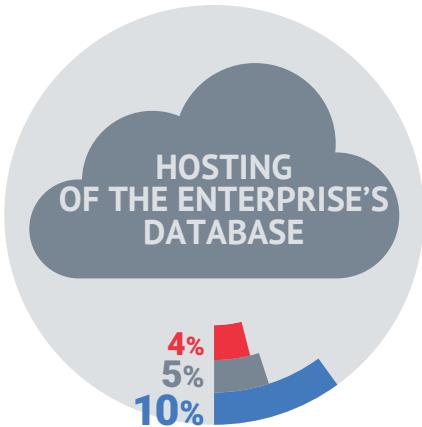
SMEs buying selected Cloud Computing services (%), 2014



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



EU15 **NMS13** **BULGARIA**



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



Conclusions

What have we found?

- The usage of digital technologies by Bulgarian SMEs is one of the lowest in the EU, lagging behind the other NMS13 as well. Bulgarian enterprises are struggling with going digital, similarly to the rest of the society.

What are the challenges?

- Uneven use of digital infrastructure: a relatively high share of SMEs have no access to the Internet, but one in three has access to high-speed and relatively cheap Internet connections.
- Only a small share of Bulgarian SMEs have adopted digital tools, such as Cloud Computing services or Customer Relationship Management software.
- The SMEs do not engage in e-commerce and do not use social media for selling their services, which may seriously hamper the future development of the economically important touristic sector.
- The digital skills of the work force are limited or non-existent, ranking at the lowest level in the EU. The Bulgarian SMEs hire ICT specialists but are two times less likely to train them, and even five times less likely to provide ICT training to other employees than their EU15 counterparts.



What needs to be done?

- The improvement of digital infrastructure is a key requirement to successful digital revolution in both society and economy. In Bulgaria's case, there is a dire need to upgrade the digital skills of the individuals. Only then can the uptake of digital technologies in SMEs be possible, and with it, their chances to compete in the Digital Single Market.
- Encourage more young people to enroll in ICT-related majors to satisfy the country's growing demand for high skilled ICT professionals.
- Strengthen e-leadership in enterprises.
- Encourage the entrepreneurs to invest in improving the digital skills of their workers by presenting them with benefits stemming from digital transformation of their businesses.
- Encourage workers to increase their digital skills by showing them benefits such as promising employment opportunities and better salaries.









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.