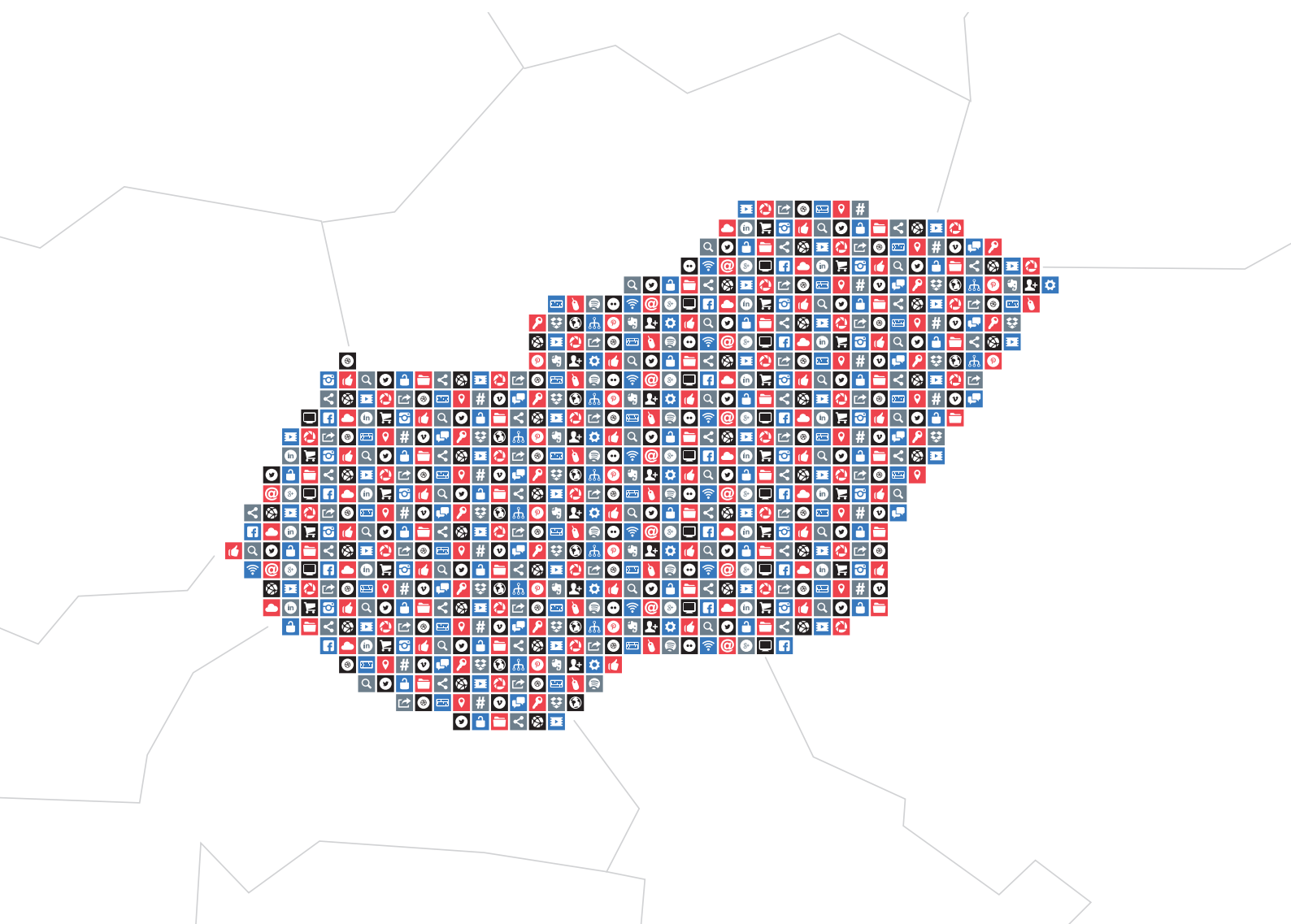


# Digital Transformation of Small and Medium Enterprises in **HUNGARY**



DELab UW Country Report

February 2016

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## About DELab

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.

## 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

# Main Concepts

## 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 utilization of digital technologies

## Digital skills of human capital

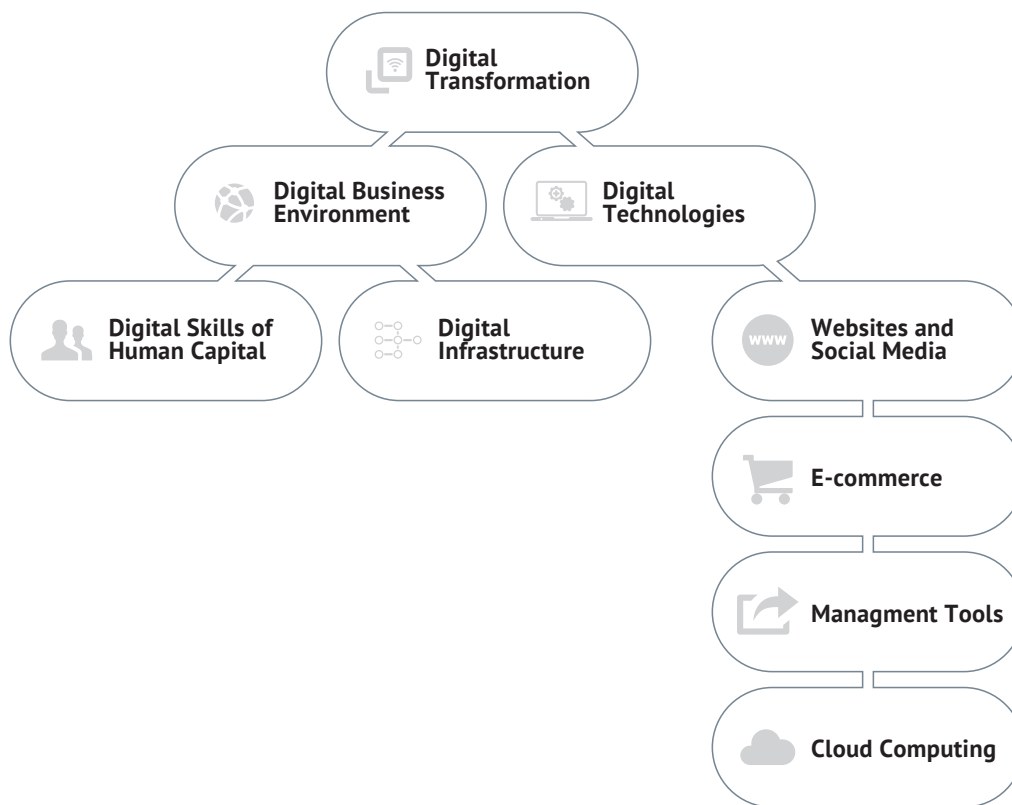
Adoption and skillful utilization of digital technologies by human capital

## Digital infrastructure

Structure needed for adoption and utilization 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



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.

# Key Findings

## Hungary in the EU28



- 1st in Social Network usage by individuals
- 12th in the Use of Internet



- 17th in Connectivity
- 17th in Human Capital
- 25th in Digital Public Services
- 26th in Integration of Digital Technology

## SMEs in Hungary



- Have access to digitally skilled workforce



- Have not taken up digital technologies, especially cloud computing services and electronic information sharing tools
- Do not invest in upgrading ICT related skills of employees
- Have access to poor digital infrastructure (lack of high-speed and affordable Internet)



# Executive Summary

In this report we examine the level of digital transformation of SMEs in Hungary 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 Hungarian SMEs ready to compete on the Digital Single Market?**

Our analysis may suggest that they are in dire need of a digital makeover. Most of the Hungarian SMEs make no use of e-commerce tools, cloud computing services and electronic information sharing tools. The poor digital infrastructure is another burden. But the most striking finding is that Hungarians seem to forget the digital proficiency that they possess and use at home once they enter their workplaces. Hungary ranks first among the EU28 in social media usage by individuals, but only a very small share of SMEs employ social media services to communicate with their customers. The employers also see no need to invest in digital trainings for their workforce. As a result, according to the indicators measuring digital transformation of economy and society (DESI), the country takes one of the last places among the EU28 and falls behind other NMS.

## Digital Map: Hungary in the EU28

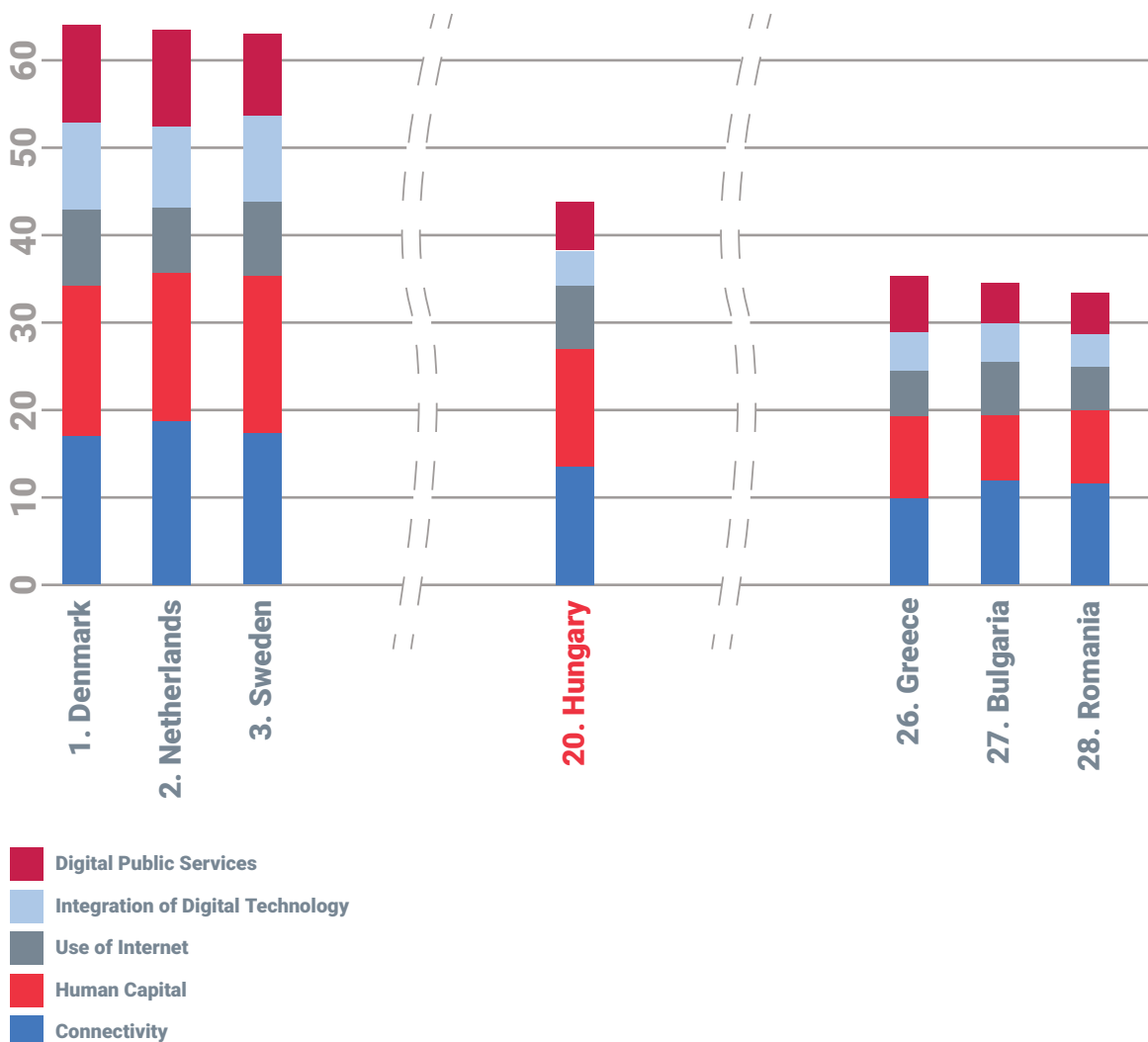
“Digital Economy and Society Index” (DESI) measures the degree of digital transformation of the EU member states. Namely, the index reports the level of development in the following categories: access, speed and quality of Internet infrastructure (represented by “Connectivity”), digital skills of society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

According to the DESI Index, Hungary takes the 20th place in the EU, revealing considerable gaps with respect to other countries in several dimensions. Regarding Connectivity (which measures the deployment of broadband infrastructure and its quality), Hungary ranks 17th, slightly below the EU average. Fixed broadband services are available for 95% of households (EU average is 97%), while fast broadband covers 78% of homes, above the EU average of 71% <sup>3</sup>.

<sup>3</sup> Source: Eurostat

Human Capital indicates the level of digital skills of a society. Hungarians, ranking 17th, perform better than the NMS average. Additionally, Hungarian Internet users are outperforming the EU28 average in the engagement of numerous online services (12th rank in the Use of Internet dimension). Hungarians are the number one users of social networks, frequently engage in video calls (5th rank) and read the news online (7th rank). However, the share of online shoppers and users of online banking is relatively low (20th position in both). The development of Digital Public Services (like e-government) is also at a low level (25th place).

**Figure 1** DESI Index, 2016

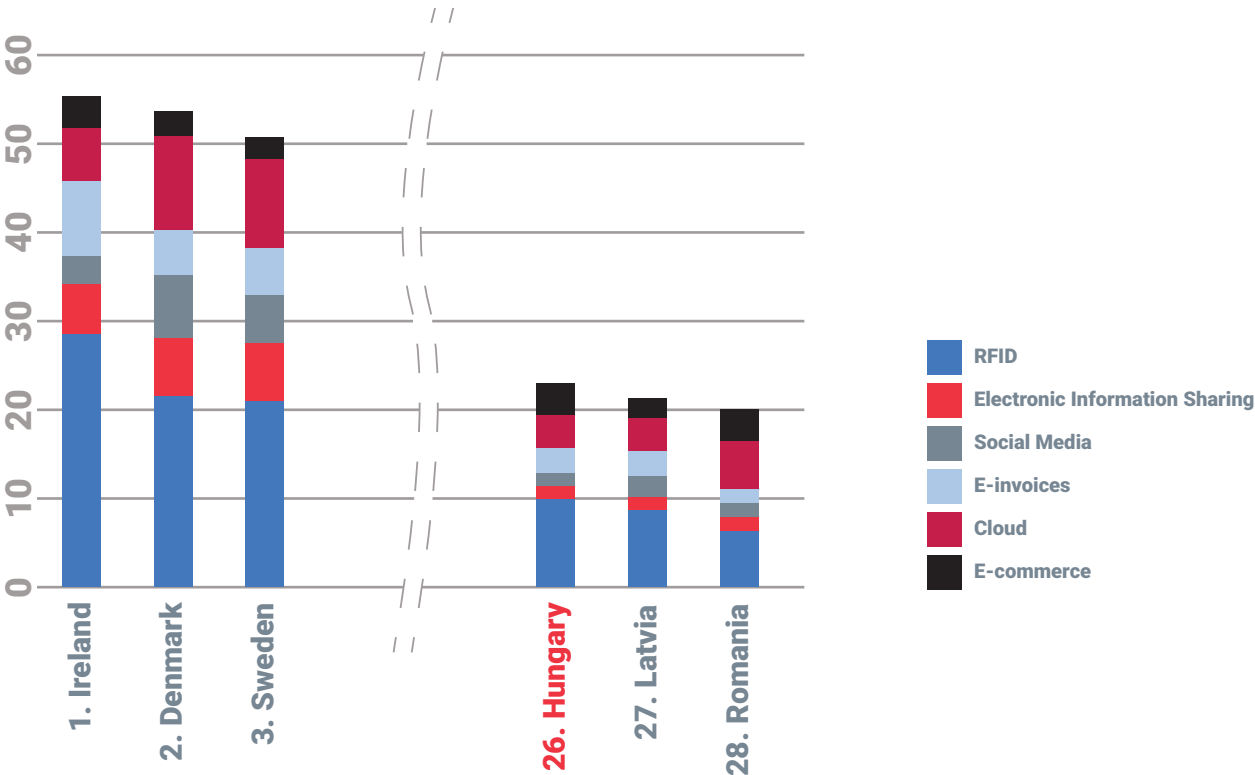


Source: Digital Agenda for Europe, DESI.

Integration of Digital Technology presents 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.

The gap in digitalisation between Hungary and the EU28 average is the most significant in the business sector. Hungary is only the 26th which shows that Hungarian enterprises do not take full advantage of the digital tools. The share of Hungarian enterprises using electronic information sharing (i.e. management tools), like ERP software (27th), cloud computing services (23rd) or social media (22nd) is one of the lowest in the EU. Hungarian enterprises are not engaged in e-commerce (20th in the share of firms; 21st in turnover share, 23rd in cross-border selling).

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



Source: Digital Agenda for Europe, DESI.

## Digital Business Environment for SMEs

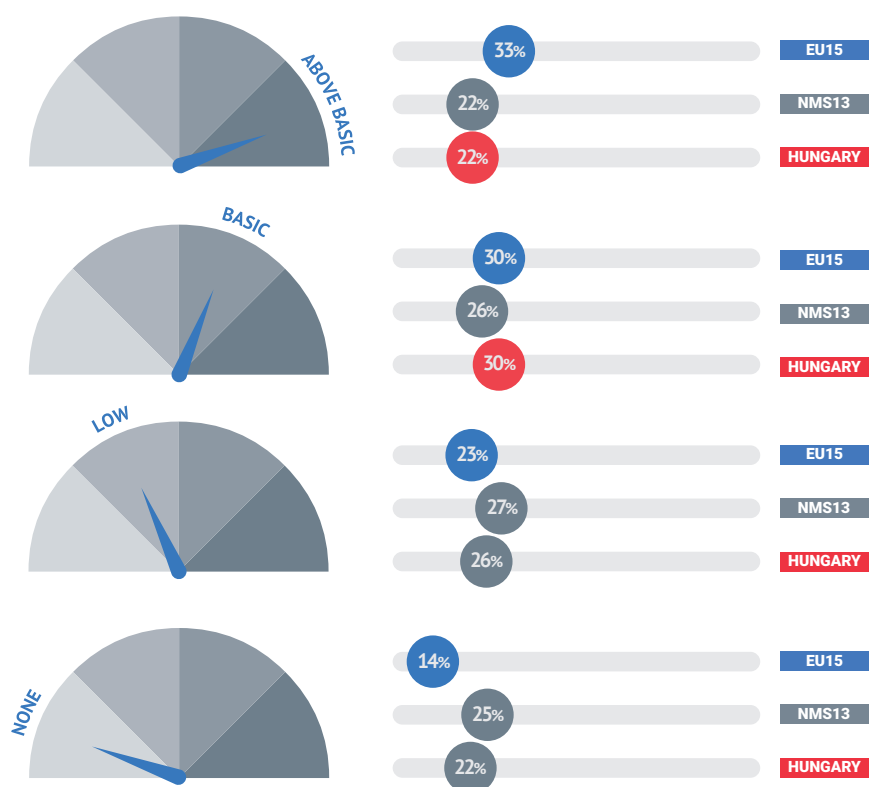
Digital Business Environment creates the common framework that enables SMEs to utilise digital technology and facilitates engagement of SMEs in the digital economy.

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

When it comes to digital skills, Hungarians perform slightly better than other NMS citizens: the share of Hungarians with “basic” digital skills (30%) is above the NMS average (26%); and Hungarians slightly less often report “low” digital skills (26%), than the regional average (27%). When it comes to communication, the majority of individuals report “above basic” skills (70%), same goes for information skills (66%). However, they are less at ease when it comes to problem solving and software skills, where they tend to fall below the EU15 average.

**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)

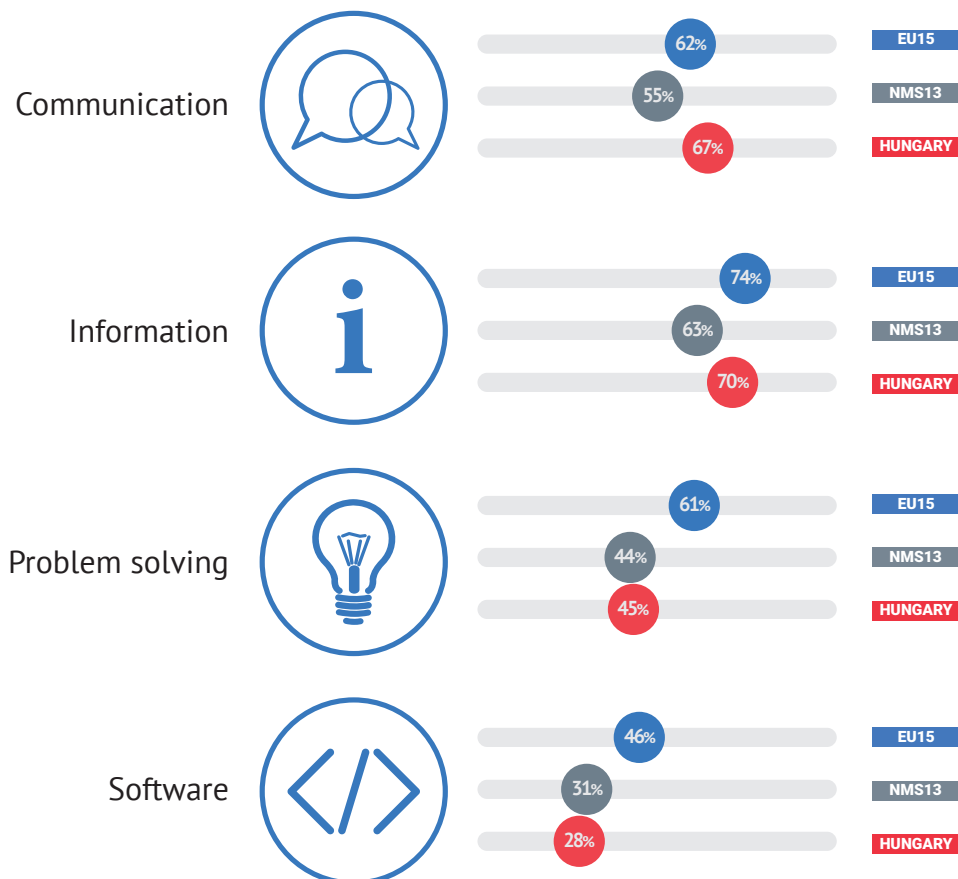
**Basic skills** refer to the ability to carry out one specific task in each category

**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

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

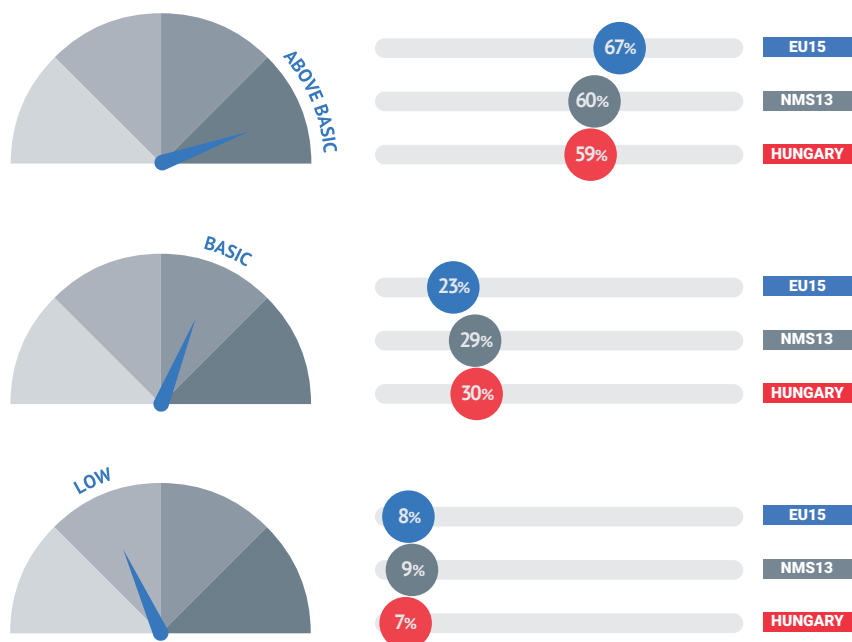


**Communication skills** include the ability to communicate online via e-mail, video calls or the social media  
**Information skills** show the ability to find relevant information online  
**Problem solving skills** represent the ability to manage files, change settings of software and use online services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

Unsurprisingly, analysis of students' skills indicates that relative to other individuals, students report more advanced digital skills. Namely, around 95% of students are equipped with “above basic” communication skills and around 90% with “above basic” information skills. However, when it comes to problem solving and software skills, Hungarian students slightly fall below the average level in the EU15 (74 to 82% in problem solving, and 74 to 84% in software).

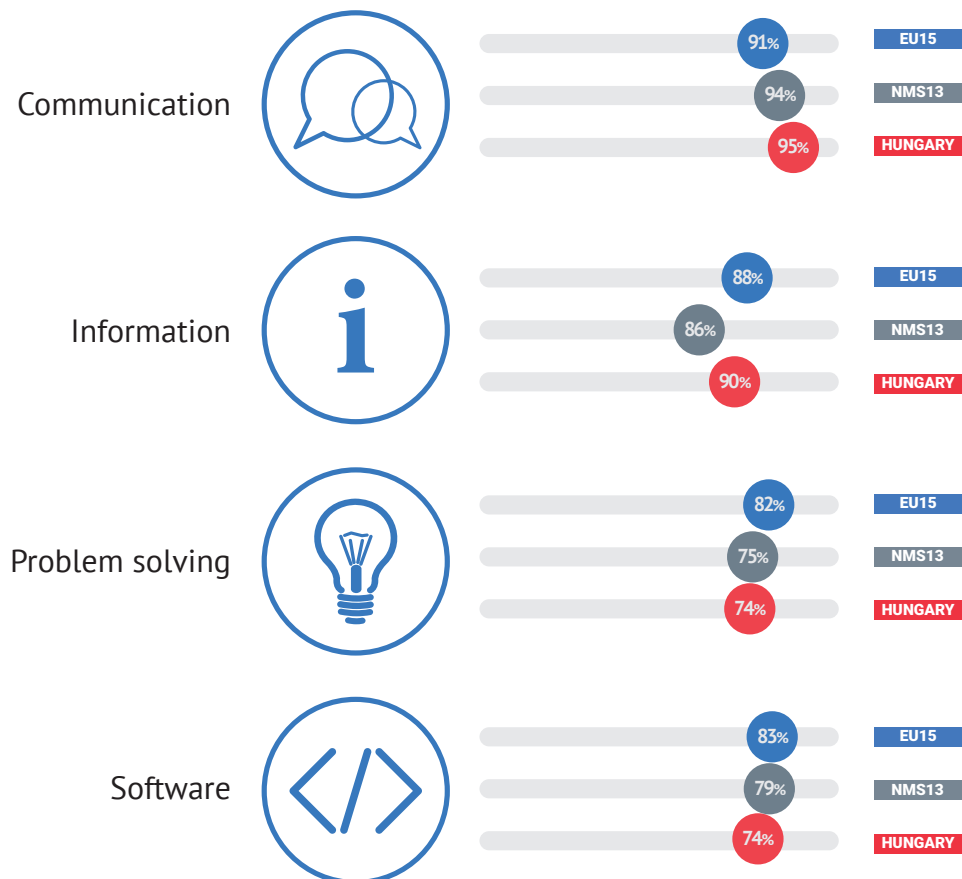
**Figure 5** Students with selected levels of digital skills (%), 2015



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



**Figure 6** Students with “above basic” of digital skills (%), 2015



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

But the most crucial impediment is the attitude of the Hungarian SMEs that seem to ignore the benefits of digital skills among all employees. Admittedly, they employ a high share of ICT specialists but are not interested to upgrade ICT related skills of their employees, e.g. twice less often invest in ICT trainings.

Overall, SMEs in Hungary show a high demand for ICT specialists: on average, they employ more ICT specialists than enterprises in the EU15. However, the share of enterprises that provide trainings for their ICT specialists is below the NMS13 level. Moreover, the share of SMEs investing in ICT trainings for their other employees is also well below the regional average level (11% to 13% in the NMS and 21% in the EU15).

**Figure 7** SMEs employing and training ICT specialists (%), 2015



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

## Digital Infrastructure

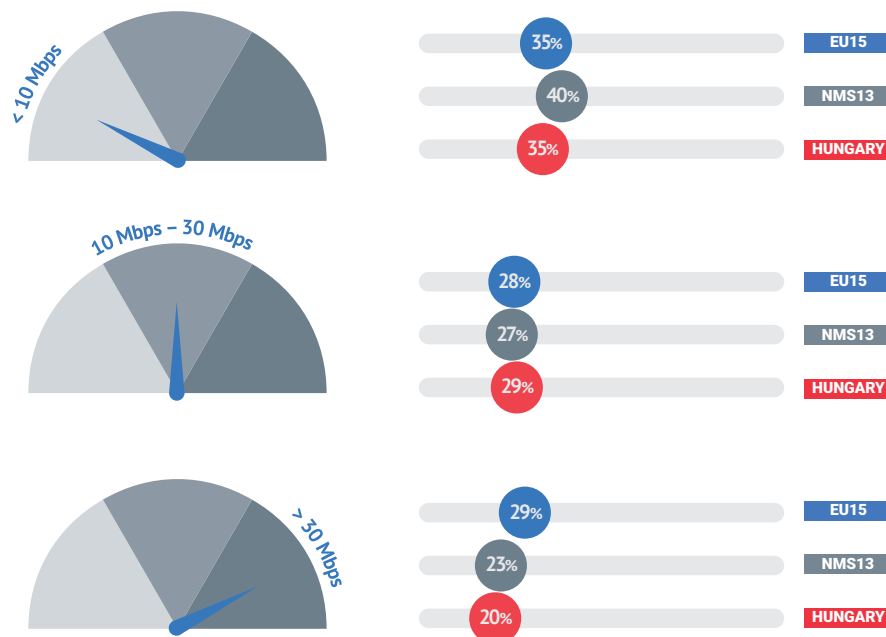
The access to high-speed and good quality Internet should be the cornerstone of digital infrastructure. Here, the situation of the Hungarian small and medium enterprises negatively stands out in comparison with SMEs in EU15: one in ten lacks access to the Internet, while in the EU15 only two in one hundred.

Hungarian SMEs mainly use low (35%) and middle-speed (29%) Internet. Moreover, while in the EU15, on average, every third SME has access to high-speed Internet, in Hungary only every fifth enterprise benefits from it. Hungarian enterprises lag behind in fixed broadband subscriptions (84% against the EU15 average of 94%), as well as mobile Internet subscriptions (63% against 71%).

**Figure 8** SMEs with no Internet access (%), 2015



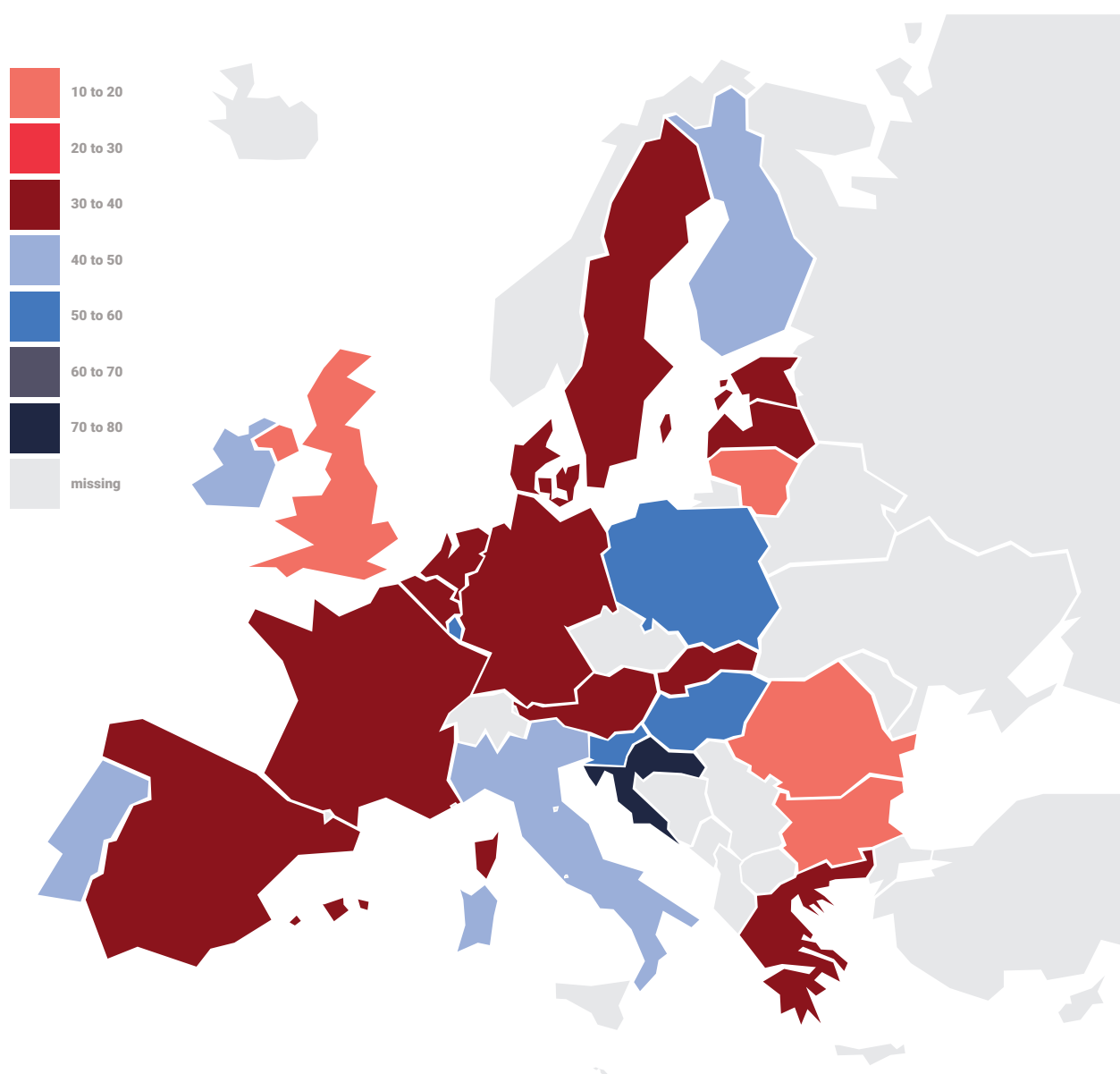
**Figure 9** SMEs according to the speed of their Internet connection (%), 2015



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

The significantly higher cost of Internet access may explain the relatively low take-up of high-speed Internet connections: Hungary is the fifth most expensive EU country in terms of median Internet prices. While in the EU15, median price of monthly subscription is 37 euros, in Hungary it reaches 52 euros.

**Figure 10** 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

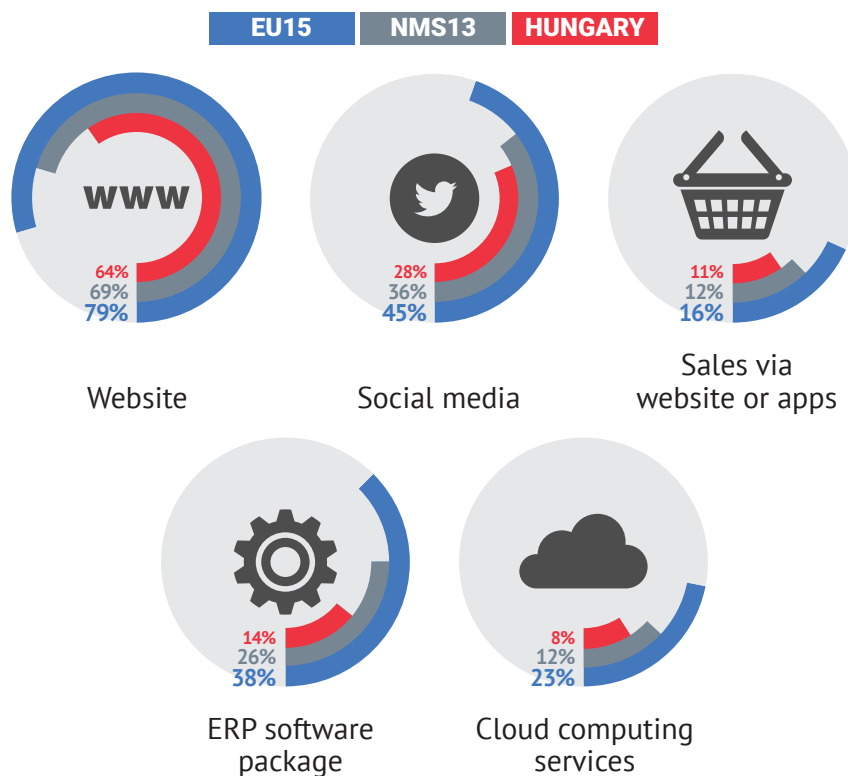


## Digital Technologies

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.

Although the development of digital infrastructure is at a slightly higher level than the regional average, the share of Hungarian SMEs that are using these tools is significantly lower. Hungarian SMEs underperform the NMS13 average in all examined categories, which means an even greater gap in comparison with the EU15. Hungarian enterprises still have a long way to go before realising the full potential of their digital revolution.

**Figure 11** SMEs using main digital technologies (%), 2015



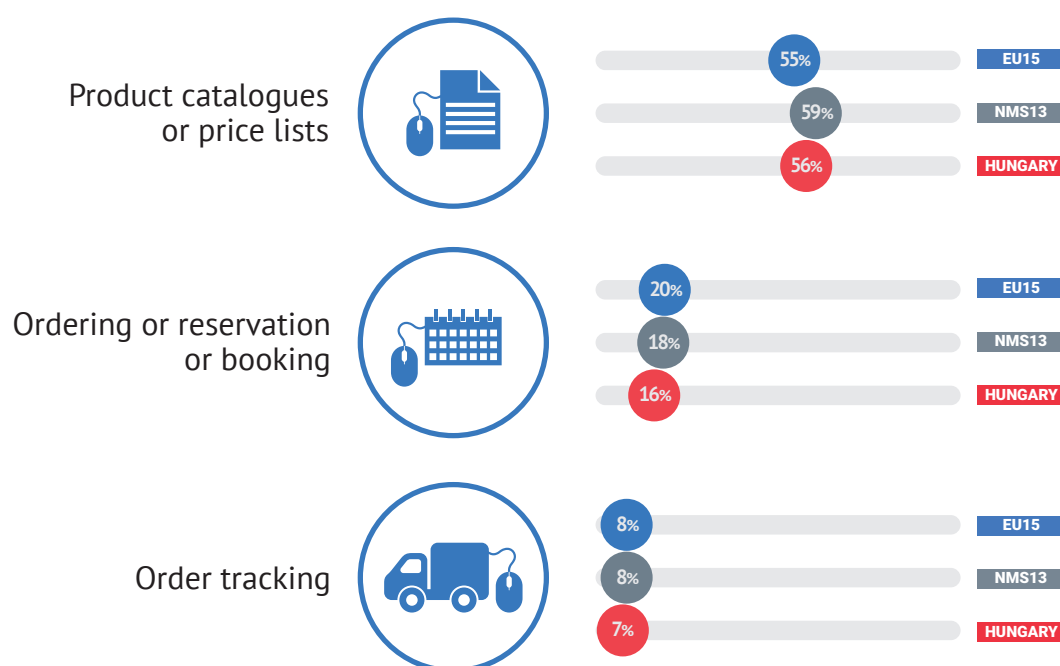
Source: DELab UW own calculations based on the data from Eurostat



## Websites and social media

Hungarian SMEs are well behind the EU15 in possessing websites (only 64% of enterprises own one, while the EU15 average is 79%). Hungarian firms, similarly to enterprises throughout the EU, mainly use a webpage to provide information about products and prices. The share of SMEs that offer online booking or online ordering (e.g. via a shopping cart) and provide order tracking is slightly lower in Hungary than in the rest of the EU.

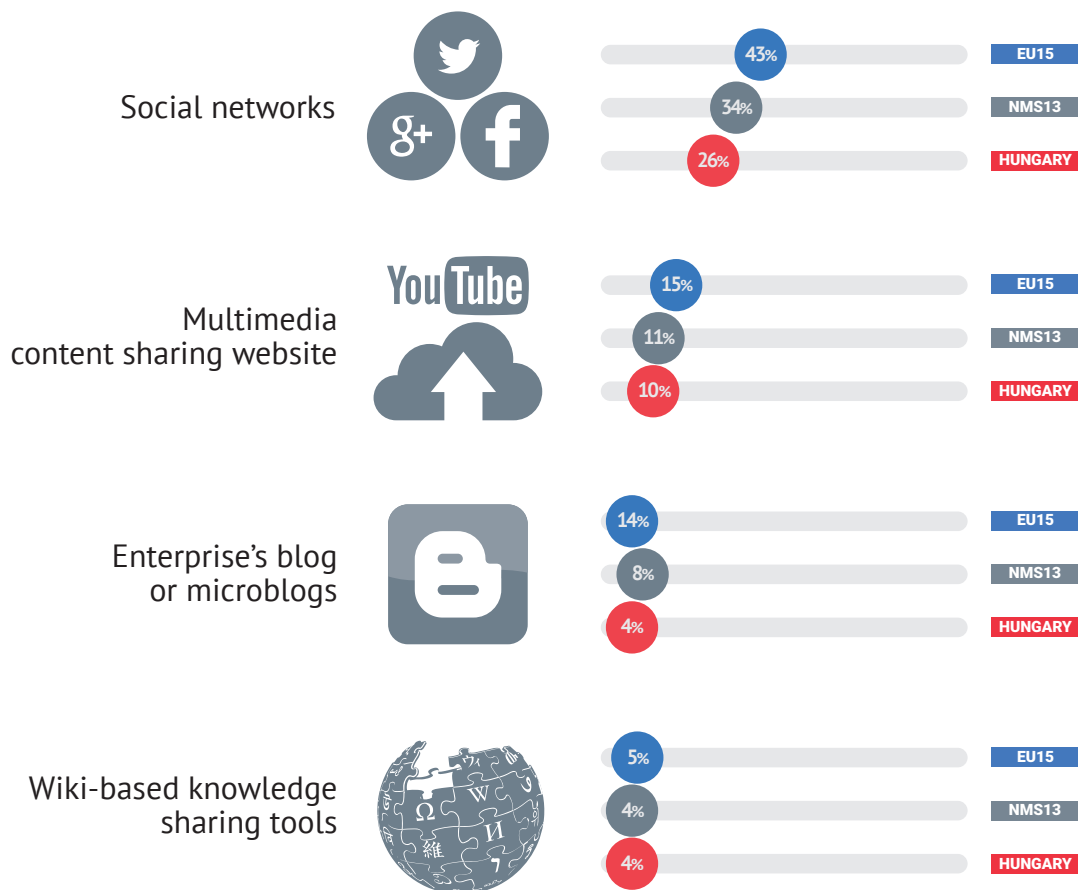
**Figure 12** SMEs with websites providing selected services  
(%), 2015



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 Hungary using social networks is relatively low: only 26% compared to 43% in the EU15. This is even more striking if one considers that Hungarian Internet users lead the EU in terms of individual (non-commercial) engagement in social media. Likewise, the usage of multimedia content sharing website (e.g. YouTube) is at a relatively low level (10% against 15% in the EU15). Moreover, blogs and microblogs are used four times less frequently by SMEs in Hungary than in the EU15. Yet, it is worth noting that the share of Hungarian SMEs that use wiki-based sharing tools slightly exceeds the average regional level.

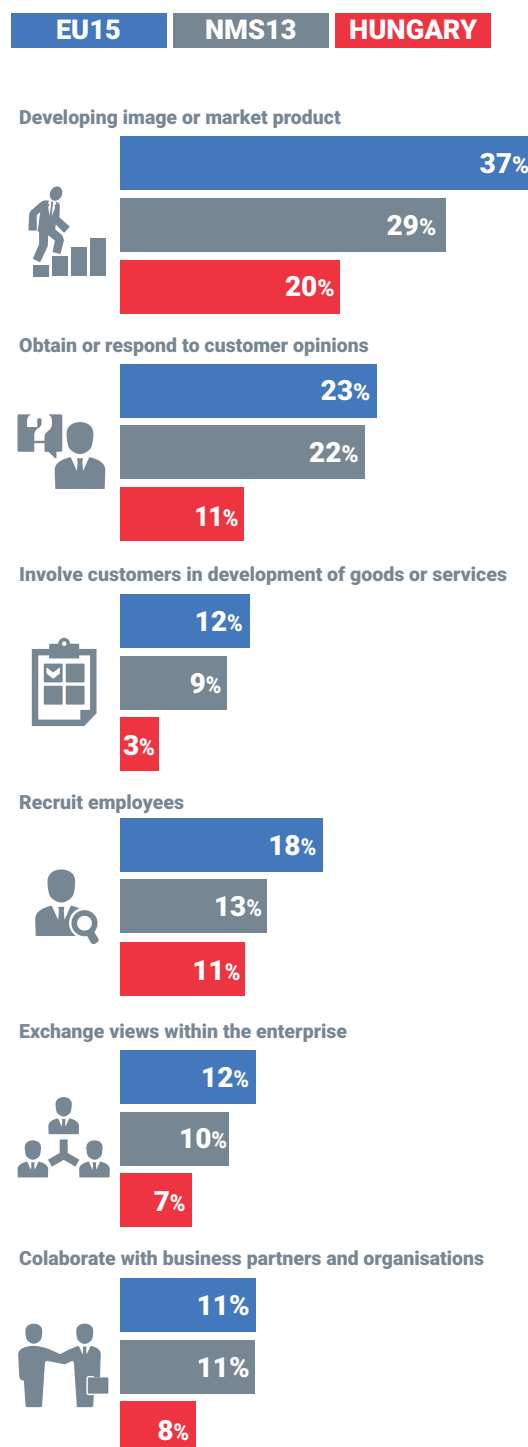
**Figure 13** SMEs using social media services (%), 2015



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

**Figure 14** Reasons for using social media services by SMEs (%), 2015

Furthermore, there is a large gap in usage of all social media services. SMEs in Hungary mainly use social media for developing image and market products, however, the share of enterprises that develop image via social media is twice bigger in the EU15 than in Hungary. Likewise, twice more SMEs obtain customer opinions and recruit employees by using social media in the EU15 than in Hungary. Furthermore, the share of SMEs that involve customers in development of goods and services is four times smaller in Hungary than in the EU15. Social media usage for communication inside the company and collaboration with the business partners also falls behind both average regional and the EU15 levels.



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





## E-commerce

**Information skills** show the ability to find relevant information online

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

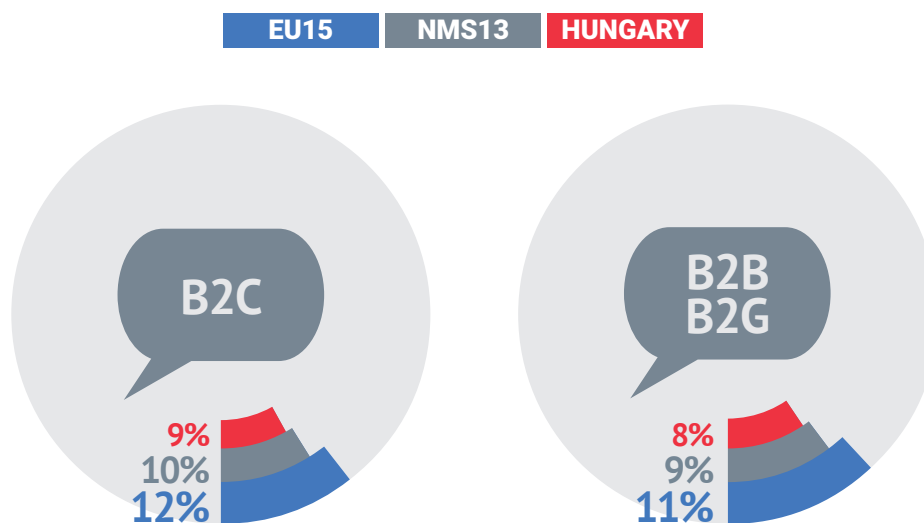
**Business to Consumer (B2C)** refers to sales to private consumers

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

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

The engagement of Hungarian SMEs in e-commerce is slightly lower than in most EU countries. A lower share of firms engage in electronic sales to private consumers (B2C: 9% to 12% in the EU15), or to other enterprises and public authorities (B2B, B2G: 8% to 11% in the EU15).

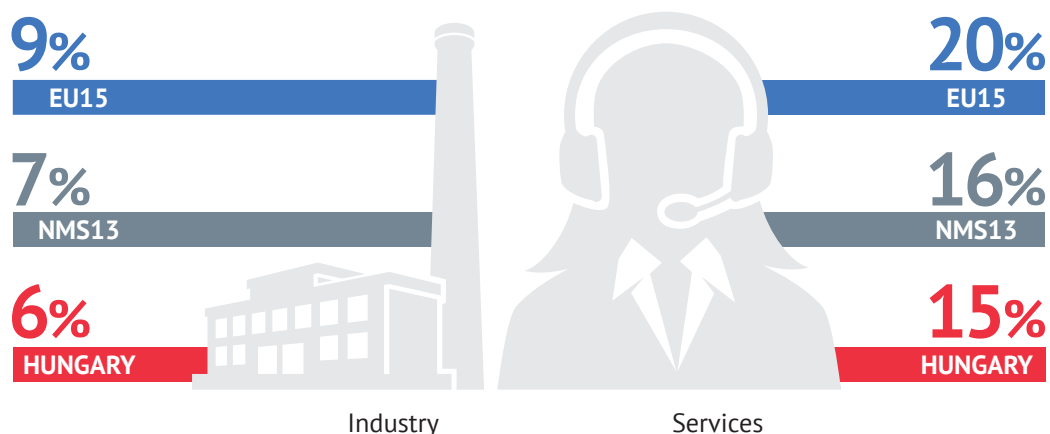
**Figure 15** SMEs selling via a website or apps (%), by type of transaction, 2015



E-commerce is concentrated in services, especially in tourism in both B2B and B2C. Overall, 15% of Hungarian SMEs sell via a website or apps in the services sector, while only 6% in industry. More specifically, the largest share of enterprises selling online provides accommodation (62%), works as a travel agency (35%), is a publisher (34%) or repairs ICT equipment (26%).

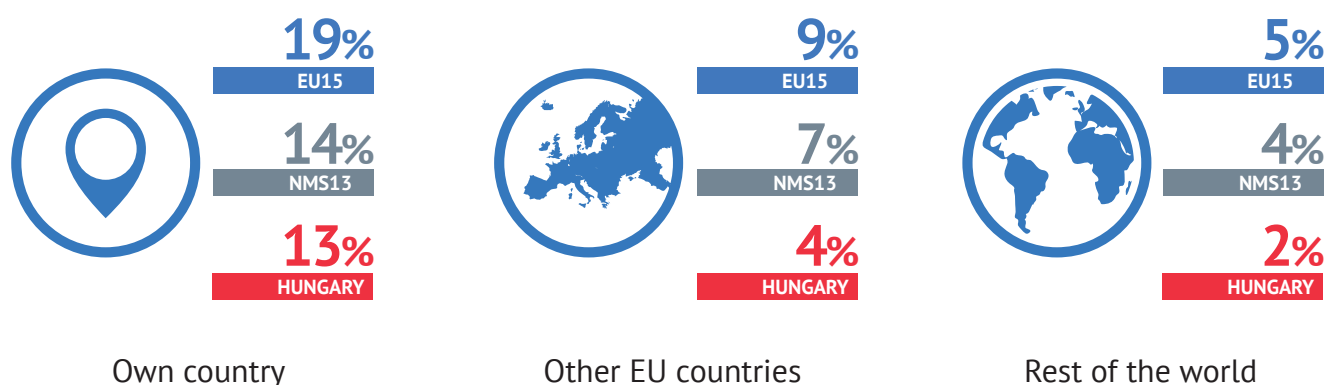
Source: DELab UW own calculations based on the data from Eurostat

**Figure 16** SMEs selling via a website or apps, according to sectors (%), 2015



E-commerce is mostly concentrated within the country, as it is the case for the EU15. However, the share of Hungarian SMEs that are involved in cross-border e-commerce is almost two times lower than in the EU15: only 4% of Hungarian SMEs make electronic sales to other EU countries, and only 2% sells outside the EU.

**Figure 17** SMEs engaged in electronic sales (%), 2015



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

## Management Tools

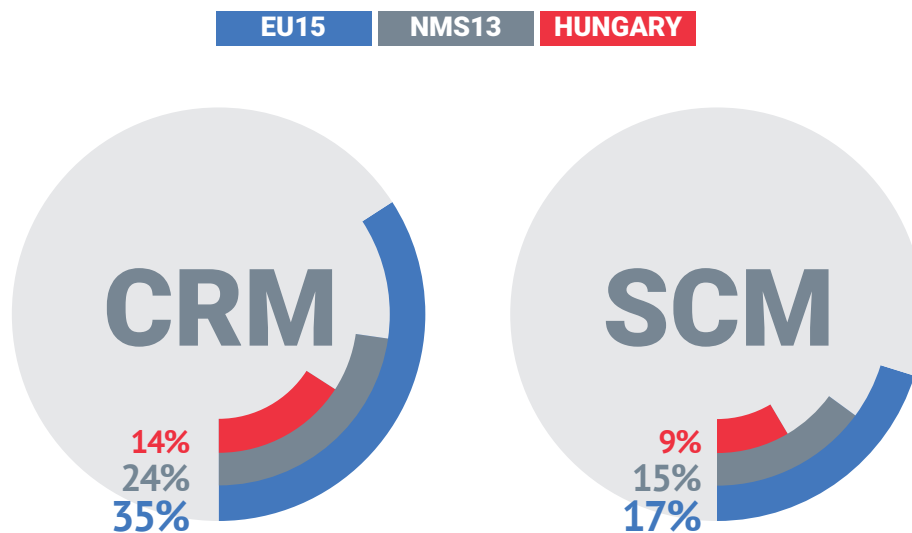
**Management tools (Enterprise Resource Planning -ERP)** enable automatic flow of information between different business functions such as accounting, planning, production and marketing.

**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 uptake of management tools by Hungarian SMEs is at a quite low level and lags behind average regional as well as the EU15 level. While around 35% of SMEs use CRM software in the EU15, only 14% of SMEs benefit from CRM software usage in Hungary. Similarly, the share of Hungarian SMEs that utilise SCM tools is twice lower than in the EU15.

**Figure 18** SMEs using CRM and SCM software (%), 2015



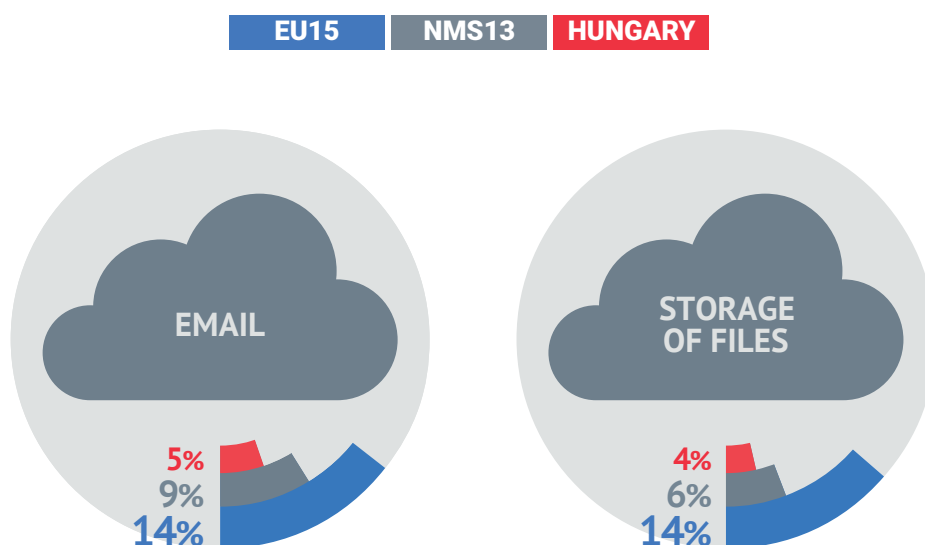
Source: DELab UW own calculations based on the data from Eurostat

## 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 Hungary reveal a very low adoption of cloud computing: they fall behind the average level of the NMS13 and the EU15 in the uptake of all CC services. Namely, the share of SMEs that use professional e-mail, hosting for the enterprise's database and cloud-CRM software is three times smaller than the share of enterprises that use them in the EU15. Moreover, three times less enterprises in Hungary than in the EU15 implements storage files, computing power services and accounting applications.

**Figure 19** SMEs buying selected Cloud Computing Services  
(%), 2014



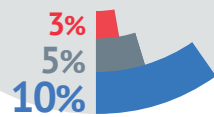
Source: DELab UW own calculations based on the data from Eurostat

EU15

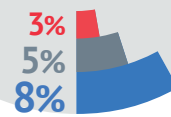
NMS13

HUNGARY

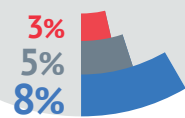
HOSTING  
OF THE ENTERPRISE'S  
DATABASE



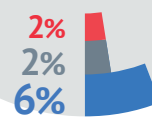
FINANCE  
OR ACCOUNTING  
APPLICATIONS



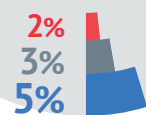
OFFICE



CRM



COMPUTING  
POWER TO RUN  
THE ENTERPRISE'S  
OWN SOFTWARE



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

## **Conclusions**

The digital transformation of Hungarian SMEs significantly lags behind that of other NMS countries. Enterprises in Hungary suffer from the poor digital infrastructure that does not enable them to benefit from the high-speed and affordable Internet. As for digital skills, while individuals are equipped with "above-basic" digital skills, enterprises do not show the interest to utilise digital competences of their employees. Furthermore, they do not invest in trainings to upgrade ICT related skills of their employees. Most strikingly, while Hungary is the number one country among the EU28 in social media usage by individuals, only a very small share of SMEs employ social media services. In other words, there is a significant gap in understanding of the benefits of social media usage for success in businesses. Moreover, in terms of adoption of main digital technologies, Hungarian SMEs significantly fall behind enterprises from both the NMS13 and the EU15. Most considerably, involvement in e-commerce, usage of management tools and cloud computing services remains at a very low level.

## **Recommendations**

The creation of DSM will reduce barriers to enter the EU markets but at the same time it will increase competition among enterprises. Therefore, new sources of advantages should be created by innovation and digitalisation of Hungarian enterprises and human capital. To avoid the so-called middle income trap, the productivity of Hungarian enterprises should rapidly be increased. And the best way to do so is the adoption of digital technologies which may help to optimise economic processes and achieve the competitive advantage at international markets. In other words, the main requirement for successful digital revolution of Hungarian SMEs is improving both the business environment and the digital skills/competences of entrepreneurs and employees.

**Problems & Challenges**

- **Digital infrastructure** - limited access to fast and cheap broadband Internet
- **Digital skills** - Low demand for employees with advanced ICT skills
- **Digital technologies**
  - Low uptake of social media services by SMEs
  - Significantly lower engagement in e-commerce
  - Considerably lower uptake of management tools and cloud computing services

**Recommended Actions**

- **Digital infrastructure**

Improve Internet infrastructure by providing better access to faster and cheaper broadband Internet
- **Digital skills**

Point out existing possibilities of gaining new digital skills (formal and informal education) trainings/online courses.

Strengthen e-leadership of Hungarian SMEs by providing training on the benefits of digital technologies to boost their business potential and improve access to their customers.

Increase awareness of threats related to lack of digitalisation of SMEs, such as: lower competitiveness for being integrated in the Digital Single Market and the risks of being excluded from the EU markets.

