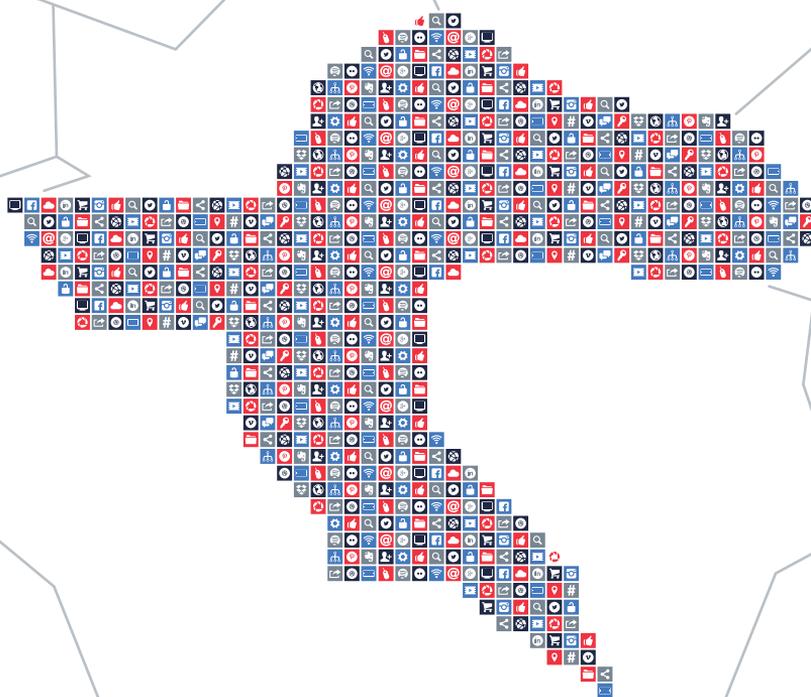


# Digital Transformation of Small and Medium Enterprises in **CROATIA**



DELab UW Country Report

February 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, 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 Croatia 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 (DSM). 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 Croatian SMEs ready to compete in the Digital Single Market?**

Our analysis suggests that Croatian enterprises are at the forefront of digital openness, outperforming their regional counterparts. They readily adopt digital technologies, especially in the area of e-commerce and cloud computing services. In spite of this, the pace of their digital transformation is being slowed down by the worst Internet infrastructure in the whole EU and the inadequate digital skills of human capital. As a result, according to the index measuring digital transformation of economy and society (DESI), the country takes one of the last places among the EU28 (24<sup>th</sup>).

# 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 utilization of digital technologies

## **Digital skills of human capital**

Adoption and skillful utilization of digital technologies by human capital

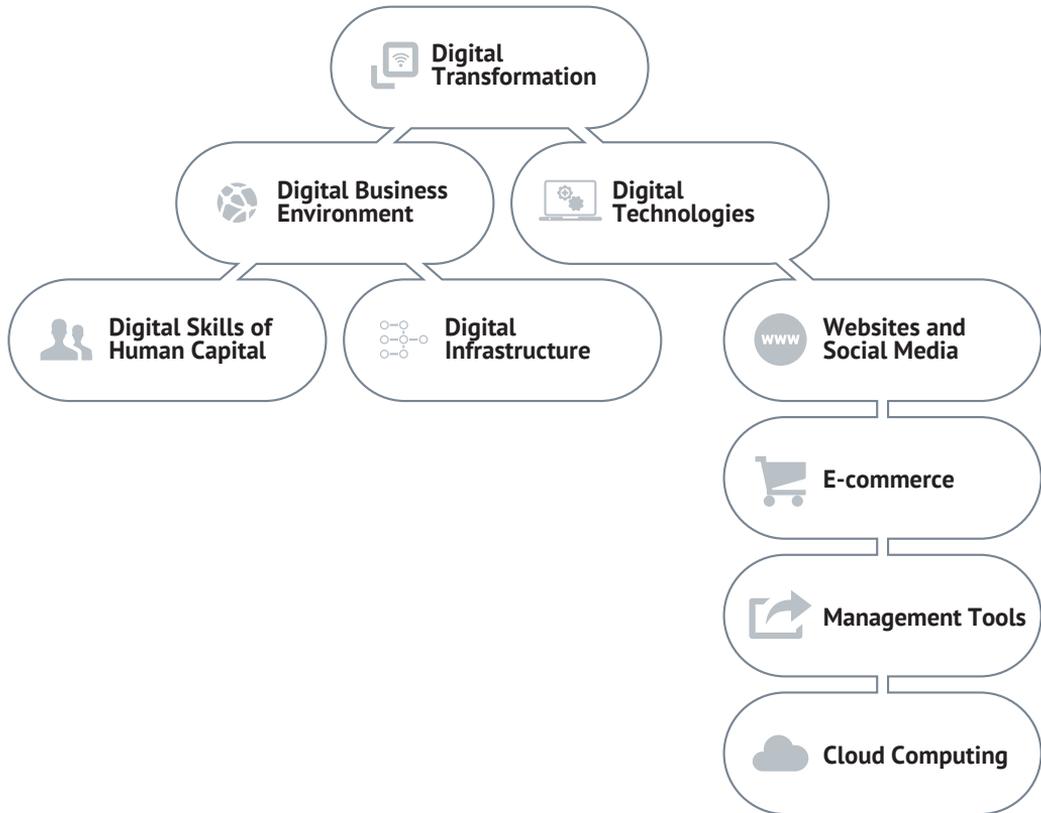
## **Digital infrastructure**

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

# 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.

# Croatia in a Nutshell

## Key findings for SMEs in Croatia



- Have taken-up e-commerce tools to enhance and support traditional tourism sector
- Employ high number of ICT specialists and invest in their training



- Lack access to high-speed Internet
- Do not adopt electronic management tools

## Croatia in the EU28



- 8<sup>th</sup> in purchases of Cloud Computing services
- 11<sup>th</sup> by Radio-frequency identification
- 13<sup>th</sup> by cross-border e-commerce



- 16<sup>th</sup> in Integration of Digital Technology
- 21<sup>st</sup> in Human Capital
- 23<sup>rd</sup> in Digital Public Services
- 23<sup>rd</sup> in Use of Internet
- 28<sup>th</sup> in Connectivity

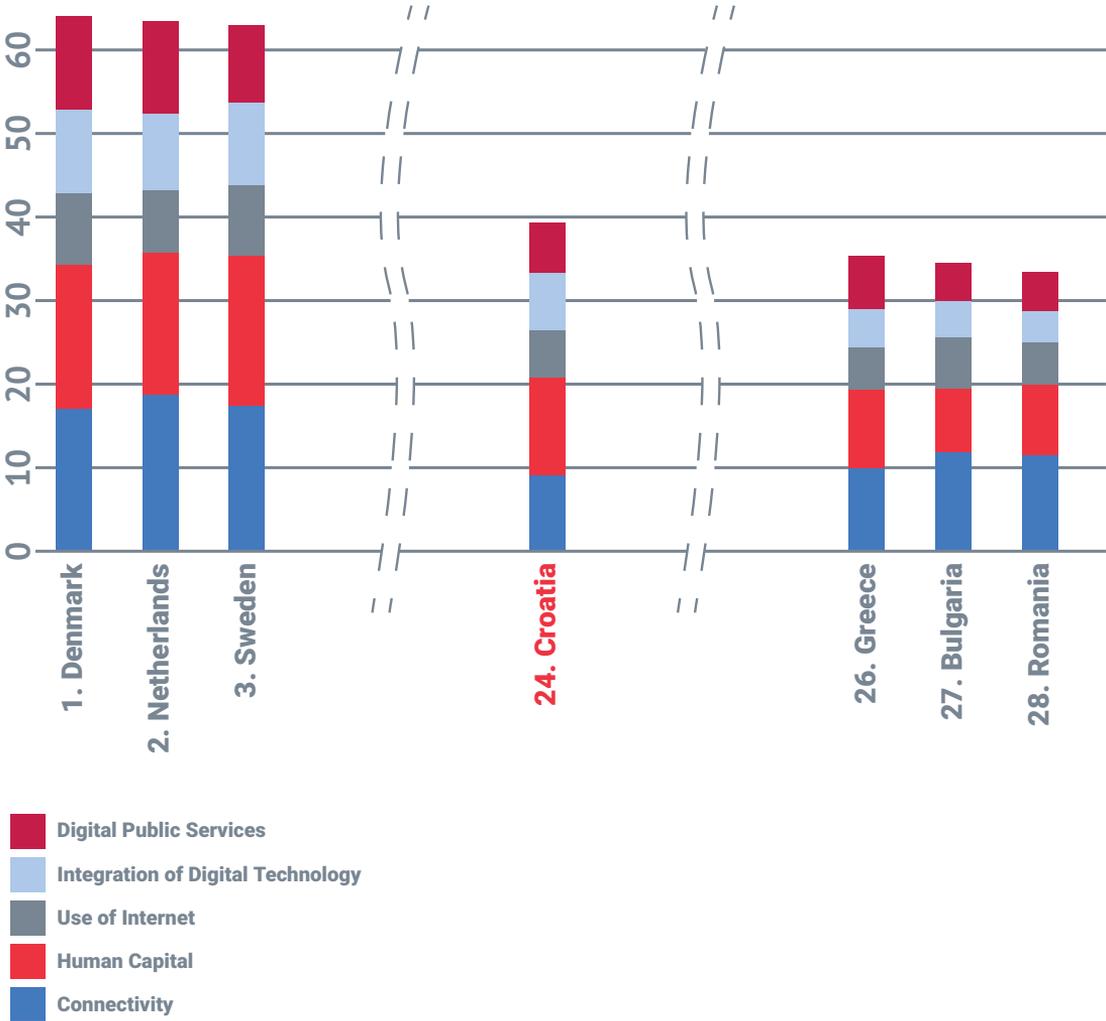
## Digital Map: Croatia in the EU28

“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, Croatia takes the 24<sup>th</sup> 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), Croatia is the weakest country of the EU, ranking 28<sup>th</sup>. The greatest problem is with the fast Internet access via fixed broadband: it is used only by 3% of Croats, while the EU average is 30%.

Croatia rank 21<sup>st</sup> in Human Capital and 23<sup>rd</sup> in Use of Internet among the EU countries. Admittedly, Croats like to read news online (4<sup>th</sup> in the EU), but they shun online shopping (23<sup>rd</sup>) and online banking (19<sup>th</sup>). The situation is somewhat better in the area of Digital Public Services, where Croatia takes the 23<sup>rd</sup> place in the EU.

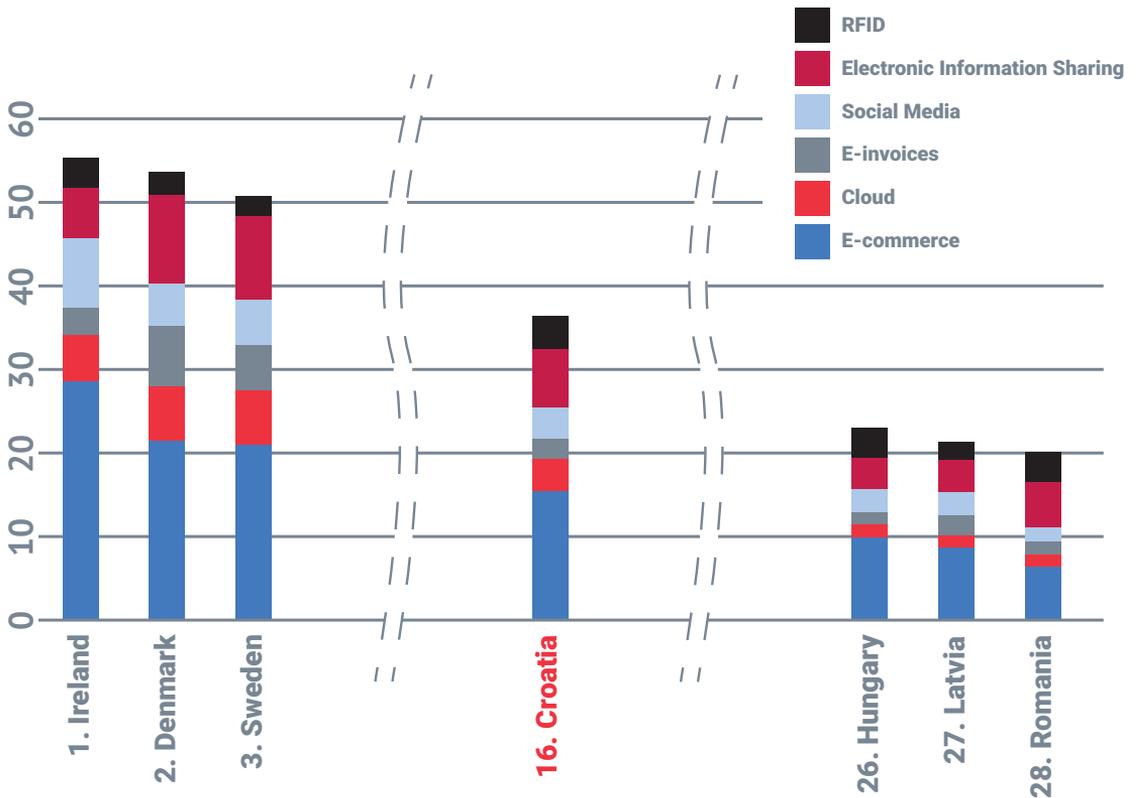
**Figure 1** DESI Index, 2016



Source: Digital Agenda for Europe, DESI

Integration of Digital Technology represents the level of Digital Transformation achieved by enterprises (with more than 10 employees), where Croatia ranks 16<sup>th</sup> in the EU. It is measured by the adoption of digital tools, like cloud computing services and engagement in e-commerce. In this respect, Croatian enterprises take regional lead together with their counterparts from Lithuania, Slovenia and the Czech Republic. They have successfully adopted cloud services (8<sup>th</sup> in the EU) and the digital technologies that allow identifying and tracking tags (stored information) attached to objects (RFID, Radio-frequency identification, 11<sup>th</sup> in the EU). Admittedly, Croats do not stand out with the usage of social media and e-invoices (17<sup>th</sup>) and with adopting electronic information sharing services (i.e. digital management tools), like ERP (20<sup>th</sup>). However, they willingly engage in e-commerce (8<sup>th</sup> in the share of SMEs selling online; 13<sup>th</sup> in cross-border selling), but in e-commerce turnover they only rank 23<sup>rd</sup>.

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



Source: Digital Agenda for Europe, DESI



# Digital Business Environment for SMEs

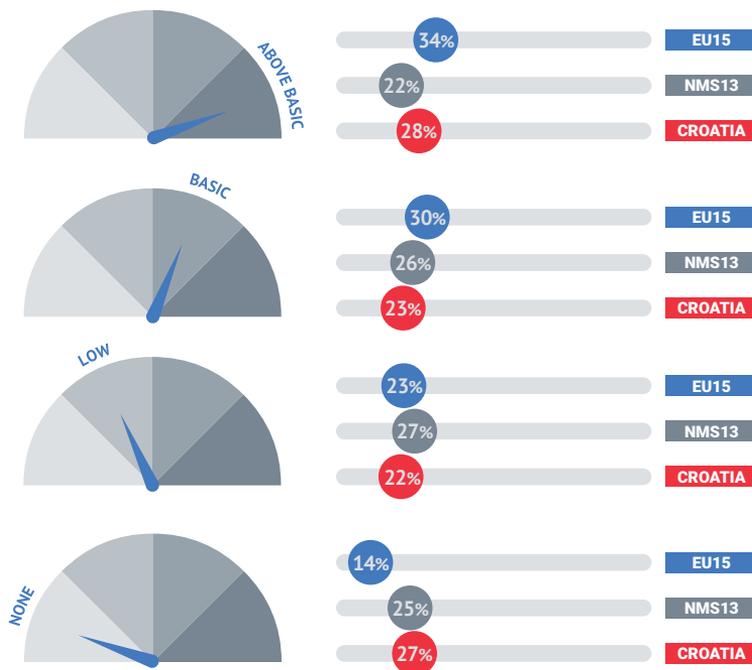
Digital Business Environment creates the common framework that enables SMEs to utilise digital technology and facilitates engagement of SMEs in the digital economy.

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

Almost 30% of Croats report “above basic” overall digital skills, outperforming the average for NMS13 (22%) but still lagging behind the EU15 level (34%). This advantage of Croatia over NMS13 is mostly noticeable in the case of software skills, which is a valuable asset for enterprises. However, Croatian labour force is relatively less skilled in online communication: only a half of the Croats (48%) report “above basic” communication skills, compared to 55% in NMS13 and 62% in the EU15. Moreover, more than a quarter of Croats reports “none” digital skills.

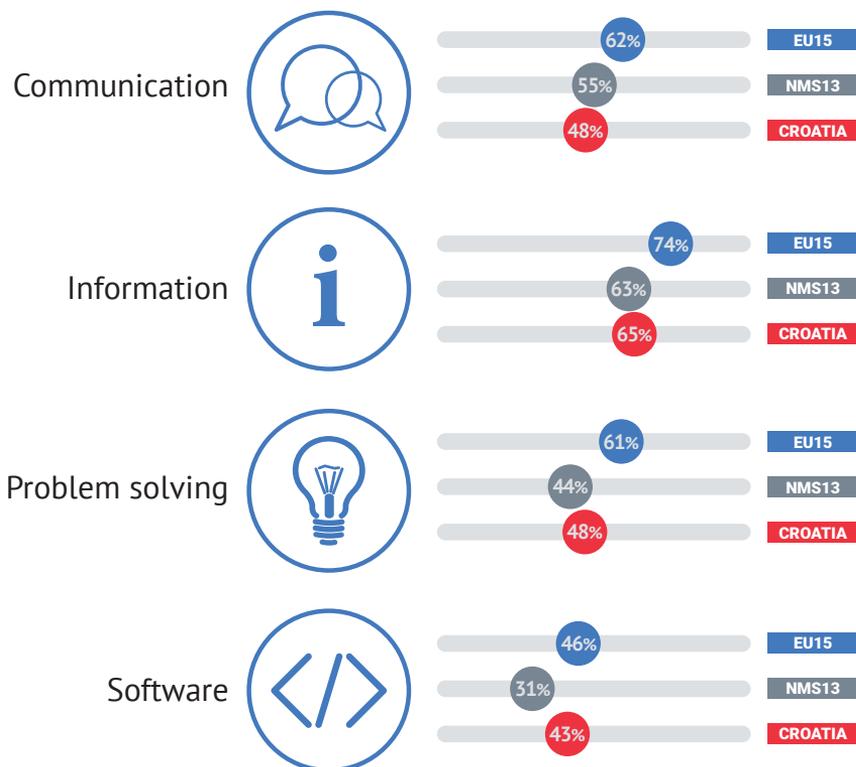
**Figure 3** Levels of digital skills amongst individuals (%), 2015



**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

**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

Croatian SMEs are highly aware of the benefits of digitally skilled employees. Not only do they employ a high share of ICT specialists, but also they willingly invest in training to upgrade the digital skills of their employees, both ICT specialist and other, catching up with the EU15 average.

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



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



# Digital Infrastructure

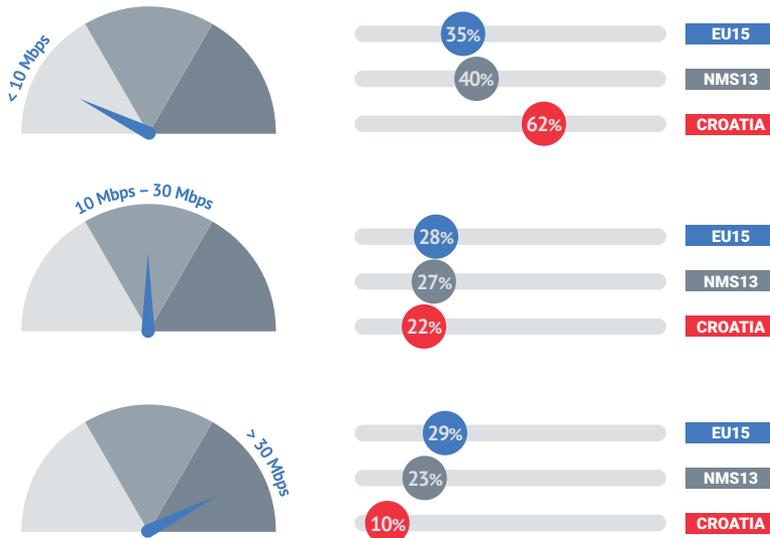
The access to high-speed and good-quality Internet is the cornerstone of digital infrastructure. In Croatia this is the weakest point of the digital ecosystem, holding down the potential of the SMEs, as one in ten has no access to the Internet (EU15 average is only 2%).

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



The share of Croatian SMEs with low Internet connection (62%) is significantly higher than the EU15 average (35%), or even the NMS13 average (40%). Moreover, while in the EU15, on average, every third SME has access to high-speed Internet, in Croatia only every tenth.

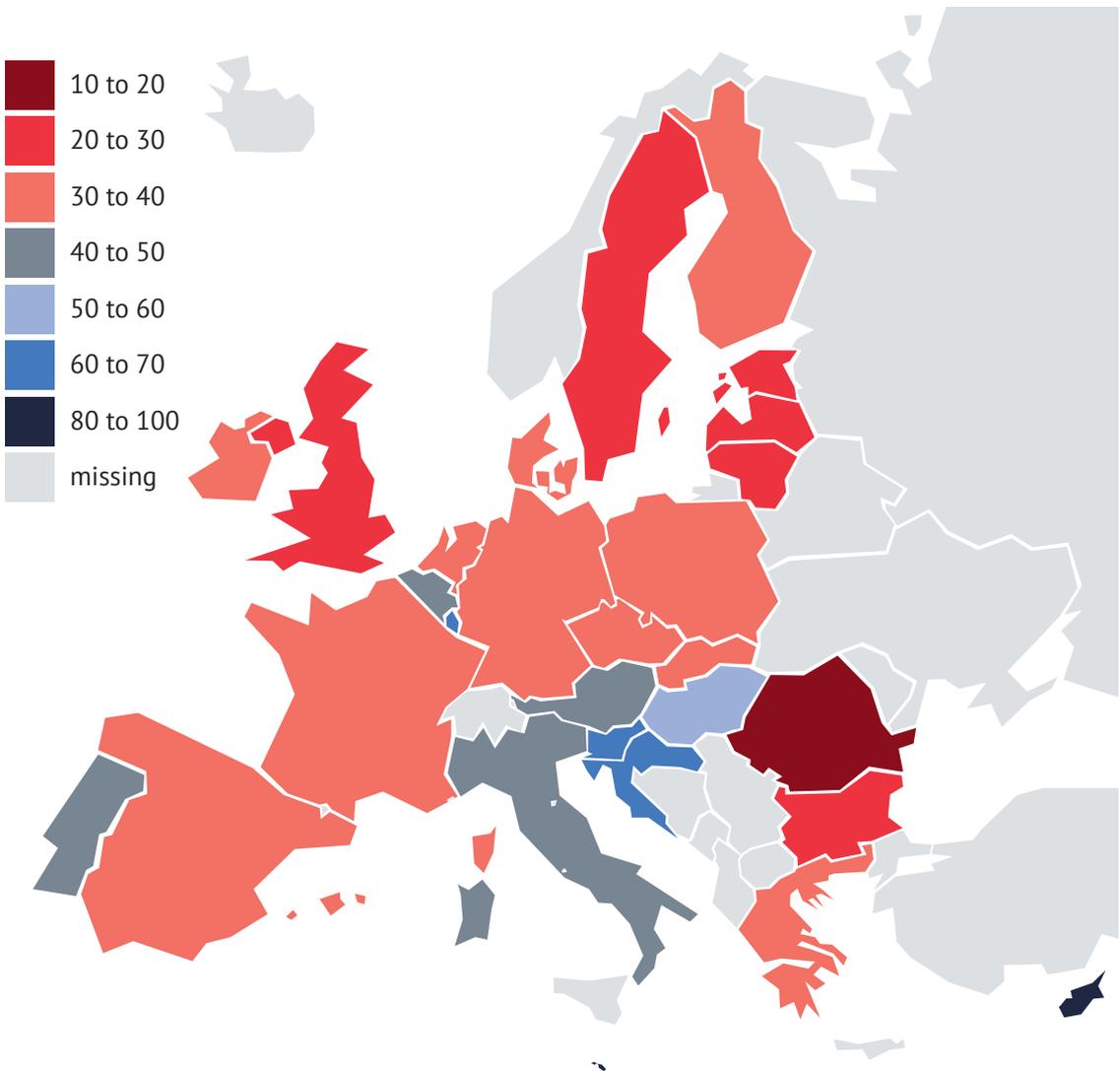
**Figure 7** SMEs according to the speed of their fixed Internet connection (%), 2015



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

The significantly higher cost of Internet access may explain the relatively low uptake of high-speed Internet connections: Croatia is the most expensive EU country in terms of median Internet prices: while the EU15 average median price of monthly subscription does not exceed 29 euros, in Croatia it reaches up to 74 euros.

**Figure 8** Median price of monthly subscription to the Internet (12-30 Mbps) in euros/PPP, 2015



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

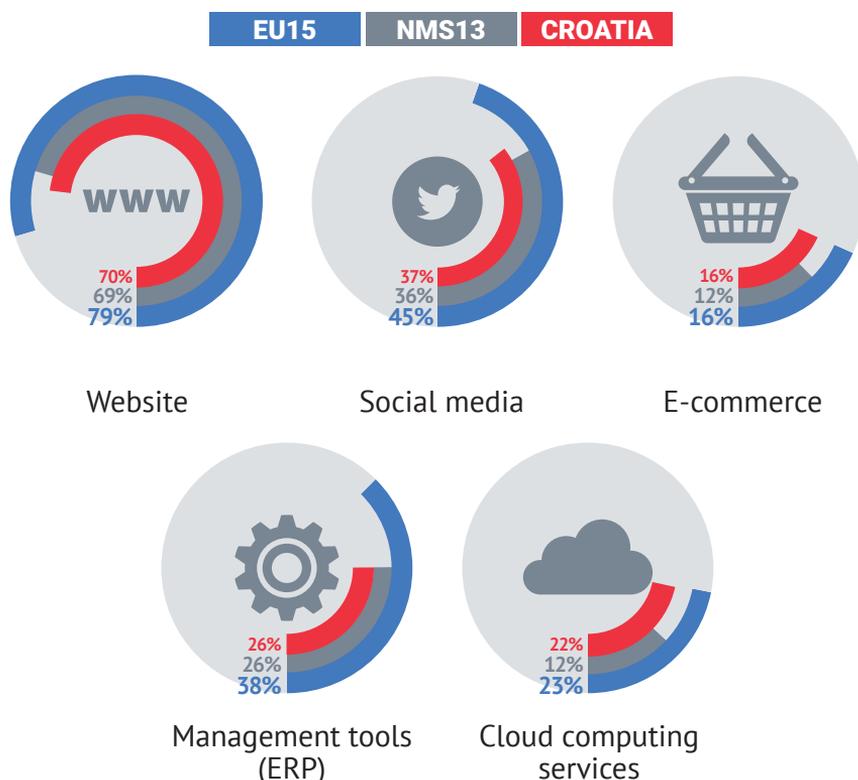


# Digital Technologies

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, the share of Croatian SMEs that are using these tools is significantly higher than in the NMS13. Despite the lower quality of the Croatian digital infrastructure, Croatian enterprises are going digital, implementing cloud computing services and ERP software, offering websites for clients, and using social media. Furthermore, SMEs are strongly engaged in e-commerce, selling via a website or apps.

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

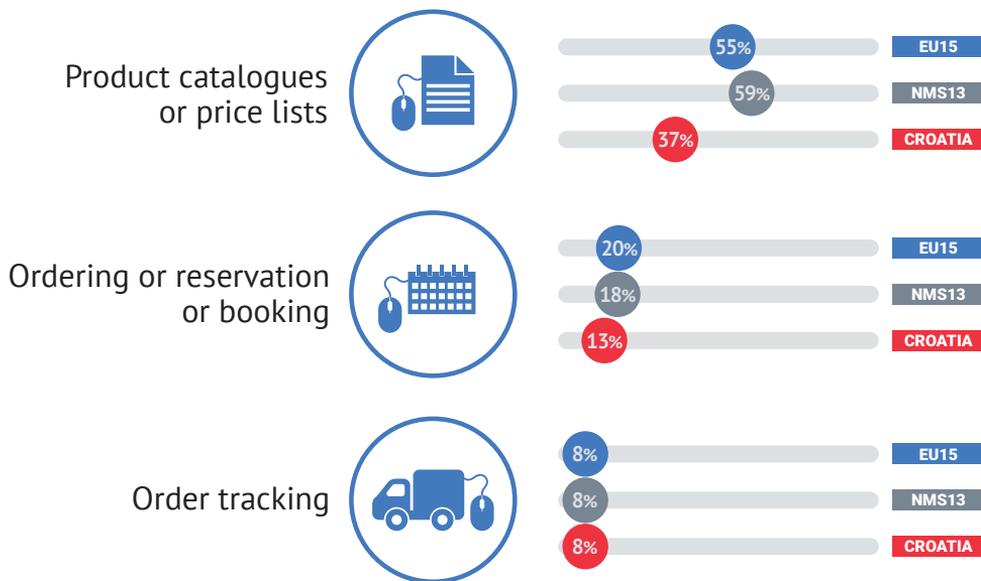


Source: DELab UW own calculations based on the data from Eurostat

# Websites and Social Media

Croatian SMEs use websites to provide information about products and prices, although less often than in the EU15 (37% to 55%). They provide order tracking at the EU level, but much less often offer online booking or online ordering e.g. via shopping cart (13% against 18% in NMS13 and 20% in EU15).

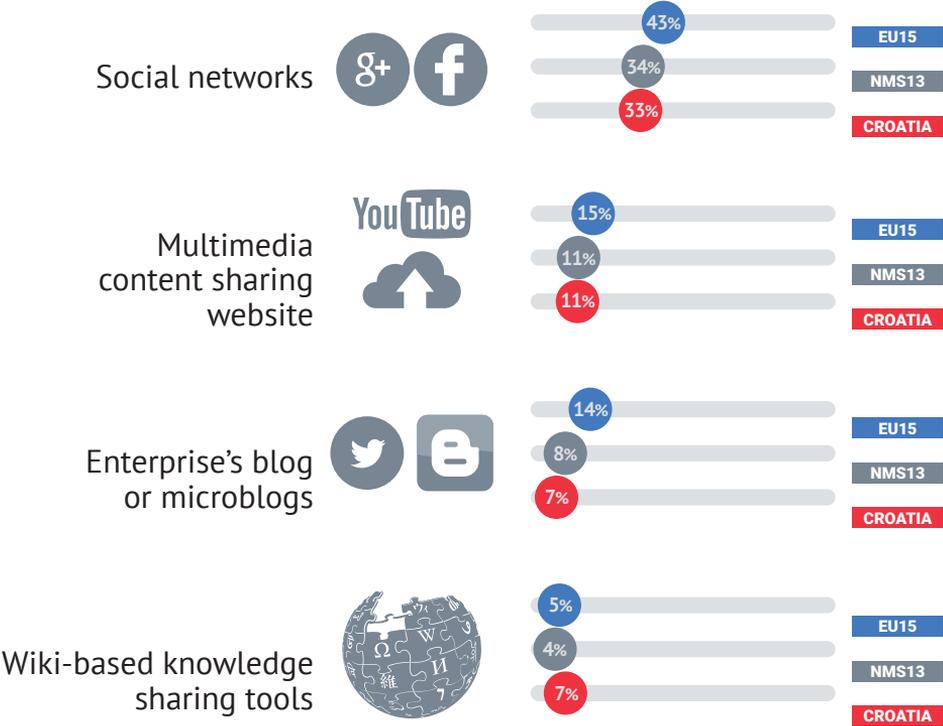
**Figure 10** SMEs with websites providing selected services (%), 2015



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 SMEs in Croatia using social networks is relatively low (33% against 43% in EU15). On the other hand, it is worth noting that SMEs in Croatia widely use wiki-based knowledge sharing tools and multimedia content sharing websites (like YouTube).

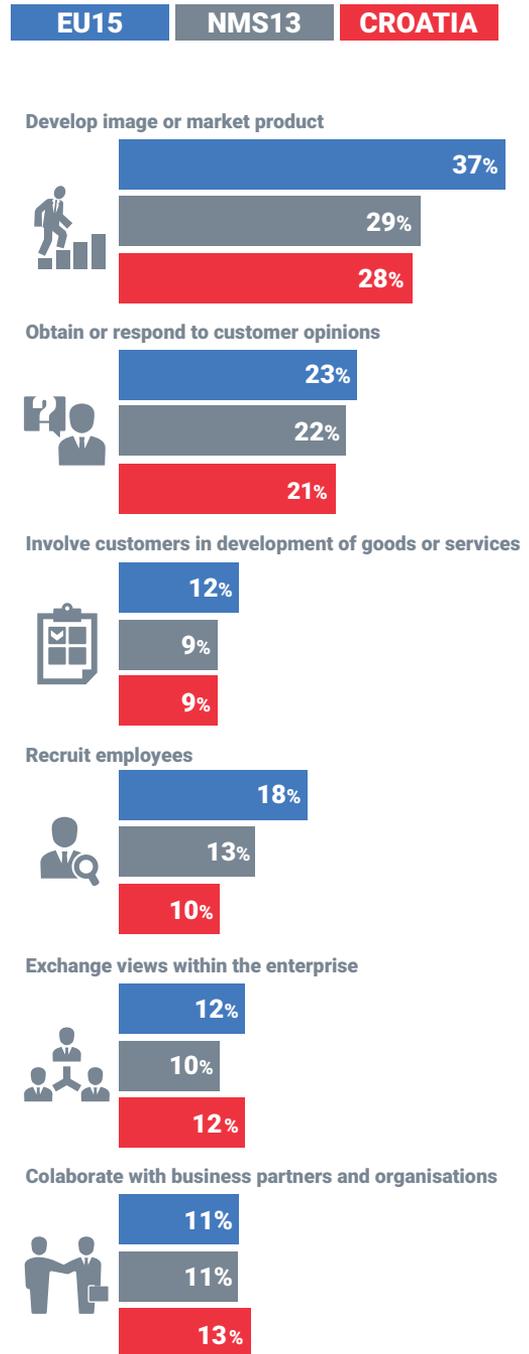
**Figure 11** SMEs using social media services (%), 2015



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

**Figure 12** Reasons for using social media services by SMEs (%), 2015

Furthermore, SMEs in Croatia mainly use social media for developing image or marketing but the gap with the EU15 level is very high (10%). SMEs use social media at the similar level as the EU15 average to exchange views within the firm (12%) and above the EU15 level for collaborating with business partners (13%). However, the share of Croatian enterprises that utilise social media to build customer relations and to recruit employees appears lower than that of the other EU member states. This finding is in line with our previous finding that Croatian business is outperforming the rest of the society in the process of digital transformation.



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

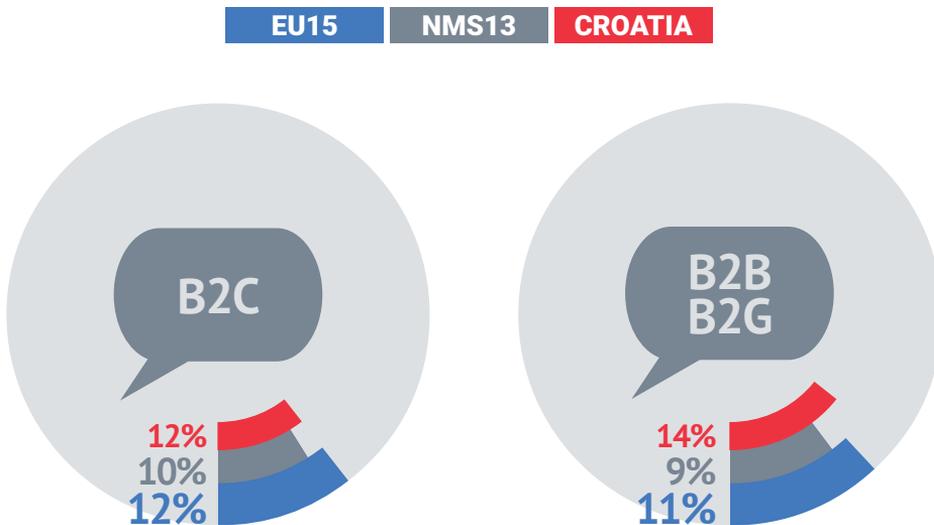
**Business to Consumer (B2C)** refers to sales to private consumers

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

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

E-commerce is one of the strongest points of Croatian SMEs: 16% of SMEs in Croatia conduct sales via websites or apps. On the other hand, as the Croatian Internet users shop online less often than EU15 citizens, SMEs are mostly involved in sales to other enterprises (B2B) and to public authorities (B2G). In this domain they exceed the performance of SMEs in EU15.

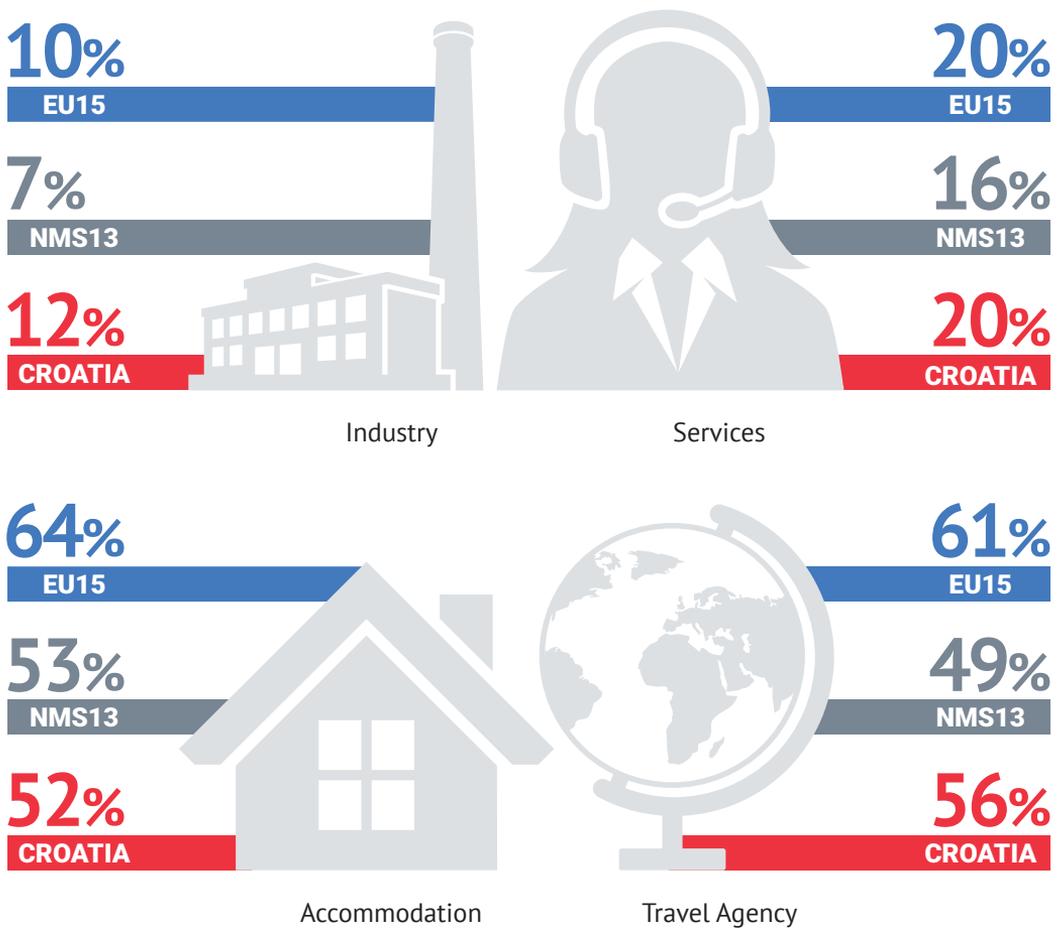
**Figure 13** SMEs selling via a website or apps (%), by type of transaction, 2015



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

E-commerce is concentrated in services, especially in tourism in both B2B and B2C. Overall, 20% of Croatian enterprises sell via a website or apps in the services sector, while only 12% in industry. More specifically, the largest share of enterprises selling online provides accommodation (52%) and works as a travel agency (56%). Sectoral data confirms the important role of tourism: around half of the enterprises sell to customers outside the EU. Another important factor may be the significant cooperation in traditional sectors (like manufacturing of motor vehicles) with former Yugoslavian countries, most notably with Bosnia and Herzegovina.

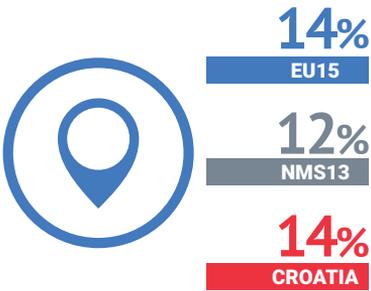
**Figure 14** Enterprises (10+ employees) selling via a website or apps, according to sectors (%), 2015



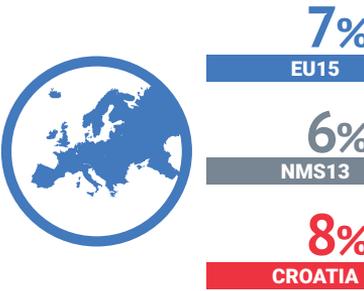
Source: DELab UW own calculations based on the data from Eurostat

Electronic sales are mostly concentrated within the country, as it is the case for the EU15. However, Croatian enterprises are strongly engaged in cross-border e-commerce, both within and outside the EU.

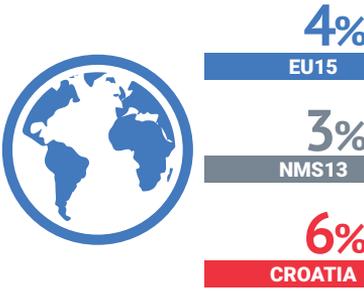
**Figure 15** SMEs engaged in electronic sales (%), 2015



Own country



Other EU countries



Rest of the world

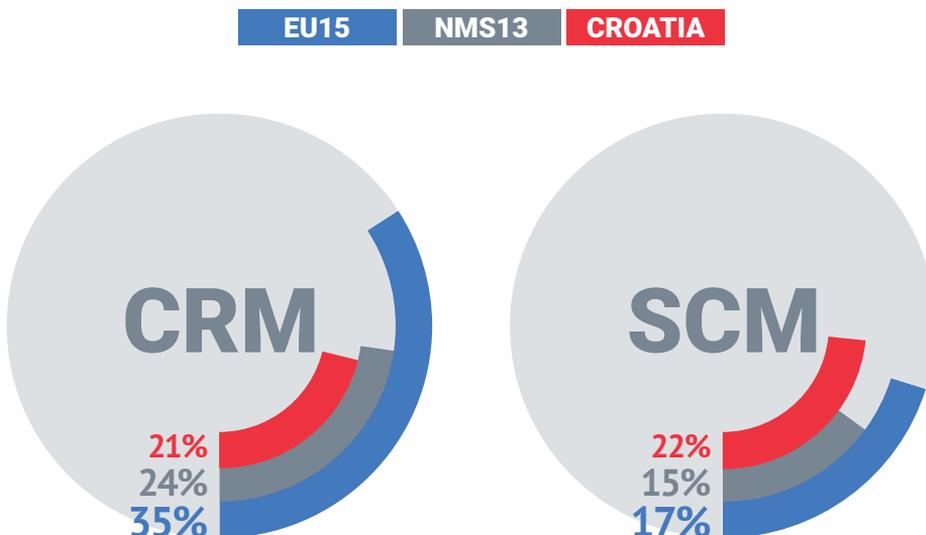
Source: DELab UW own calculations based on the data from Eurostat

## 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 Croatia are intensively using management technologies for the management of processes within the company. While the usage of ERP software is on the NMS13 level (26%), Croatian firms are outperforming their European counterparts in the usage of supply chain management (22% against 15% in NMS13 and 17% in EU15). However, they use digital technologies for analysing customer information (CRM) much less willingly than SMEs in the EU15. This finding further supports that SMEs in Croatia are strongly cooperating with each other through new digital tools, while additional effort is needed to engage customers.

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



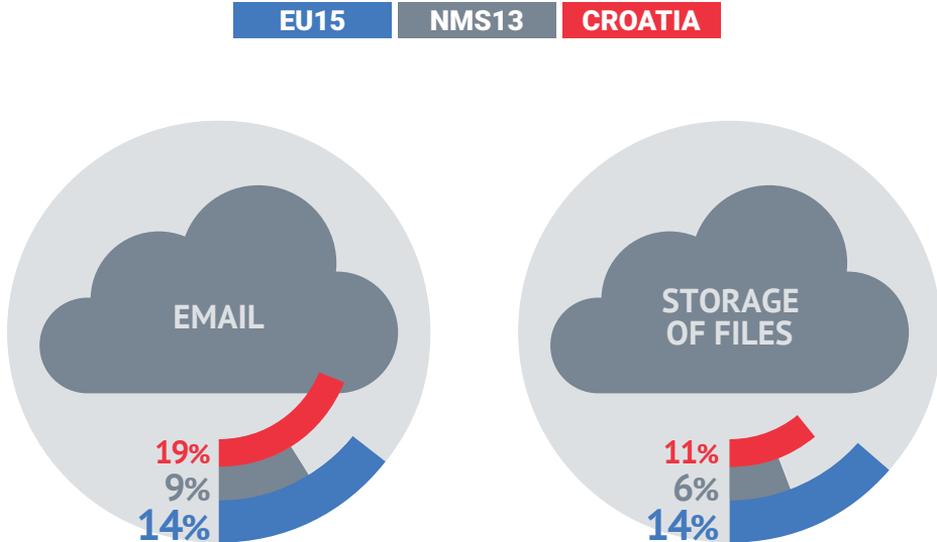
Source: DELab UW own calculations based on the data from Eurostat

# Cloud Computing

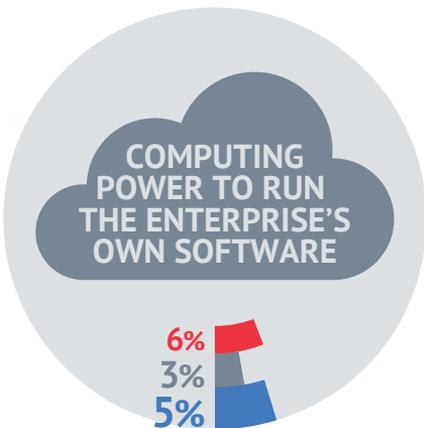
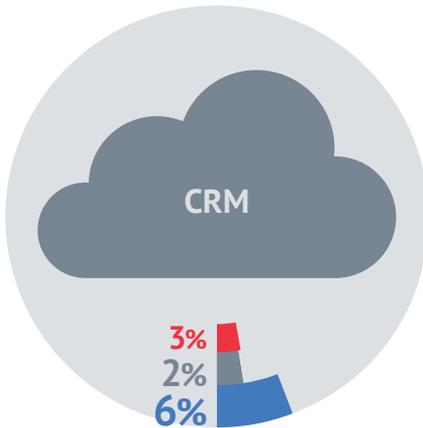
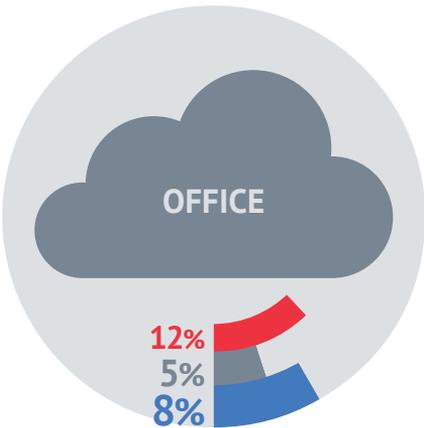
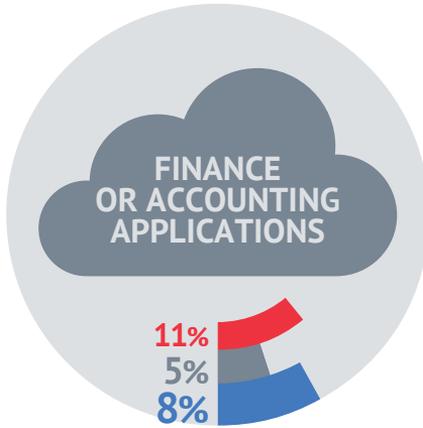
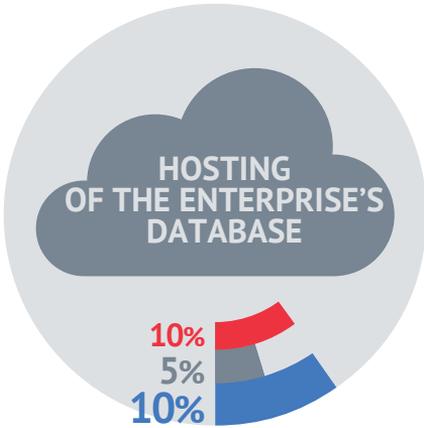
**Cloud Computing (CC)** refers to ICT services that are used over the Internet to access software, computing power, storage capacity, etc.

Croatian SMEs are much ahead of the region when it comes to usage of Cloud Computing services (22% to 12% in NMS13). The uptake of the presented services is more than the double of the regional average (with the exception of CRM). Furthermore, Croatian firms are also showing the path for enterprises in EU15 as they more frequently purchase such services as: e-mail services, cloud based office services (like Google Docs), finance/accounting applications, computing power services and hosting for the enterprise's database.

**Figure 17** SMEs buying selected Cloud Computing Services (%), 2014



**EU15** **NMS13** **CROATIA**



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



# Conclusions

## What have we found?

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- Croatian small and medium enterprises seem to be the true driving force behind the Croatian digitalisation. While Croatia is considerably lagging behind the EU15 in other dimensions, Croatian SMEs are closing the gap in the adoption of digital tools such as Cloud Computing services and are highly engaged in e-commerce (even being successful in cross-border sales). The use of digital tools is particularly intense in the tourism sector.
- As for digital skills, Croats present a mixed picture: while the share of individuals without any digital skills is slightly above the regional average, the share of Croats with skills crucial for SMEs (e.g. “software skills”) is relatively high. Additionally, Croatian SMEs invest in the digital skills of their employees at the same level as the EU15.

## What are the challenges?

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- The access to fast and cheap broadband Internet is alarmingly low, slowing the progress of digital transformation in enterprises.
- The SMEs reluctantly use social networks to communicate with their customers and recruit new employees.
- The share of Croats with advanced “digital communication” skills is relatively lower than the regional average, which may affect their ability to use the diverse digital communication channels in their work life.

## What needs to be done?

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- To go digital, the SMEs need supportive digital environment, especially accelerated improvement of digital infrastructure.
- In order to boost both external and domestic e-commerce the Croatian SMEs should use the potential of digital tools, particularly social media, to build more intensive relations with their customers.
- The SMEs should invest in training in communication skills for their workers.







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.

