

# DIGITAL COMPETENCE IN THE VISEGRÁD COUNTRIES

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## Abstract

One of the key competences today is digital competence. This competence plays a role not only in our work, but also in our daily lives. There is no part of our lives in which the importance of digital competence does not appear. Its significance has been extremely scaled up by the covid pandemic and the challenges generated thereby. The European Union has been investigating for years how its member states utilize possibilities being offered by digitalization, both in private life and in the workplace. The current study is examining V4 countries (Hungary, Slovakia, Poland, Czech Republic) from this perspective, on the one hand, building on the DESI index being provided by the EU, and by means of analyzing Eurostat statistics. The results of the research demonstrate that although V4 countries are behind in this question from several aspects, there are multiple areas where exploiting the possibilities offered by the digital space is already functioning.

**Key words:** DESI index, digital competence, labor market

**JEL Code:** O34, O35

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## Introduction

Digitization is part of our daily lives. We regularly use computers, smartphones, software in our personal life, at work, when studying. An important question is the extent to which users are open to the use of IT tools and the extent to which they have acquired the knowledge associated therewith. It is therefore important to know whether users have the right digital competences (Juhász, 2020). Our century is characterized by the spread of social media and digital devices, and the accelerated communication. Information and communication technologies are emerging in many areas of life, knowledge and use of which are inevitable. However, it can be said that there are gaps in the use of digital competence in the younger and older generations as well, which can be detrimental to entering the labor market as well as in other areas of life. (Bak, 2020).

Digital skills, more specifically digital literacy, play a very important role in social and economic development. Without digital literacy, it is almost impossible to participate in

economic life and the digital society. Digital technologies are not only an integral part of production / service production but also unavoidable in everyday life. Beyond the world of work, digital transformation has an impact on people's lives and communication. However, with the change in digital technologies, it is also necessary to modernize digital literacy and digital competences in order to avoid or reduce the risk of digital exclusion (Bejaković - Mrnjavac, 2020).

Digital economy has a key role to play in stimulating economic growth and sustainable development. In the European Union, too, it is essential to examine this at country level and in a regional context. Considering a number of factors, the EU analyzes the extent to which the population and economy of a given member state meet the challenges of technology and how it is used or how well each digital achievement can be won. The present study analyzes the digital competences of the Visegrád countries based on some interesting Eurostat statistics the DESI index developed by the EU. The authors will focus on a few factors without claiming to be exhaustive.

## **1 Literature Review, that is, a Couple of Thoughts on Digital Competence and its Economic Utility**

Several concepts of digital competence are known. In part, it involves a set of attitudes, knowledge, skills, awareness, and values that are of great significance when using disruptive digital technologies and tools in an organization. Furthermore, digital competence means the confident and critical use of electronic media for work, leisure and communication. These skills are related to logical and critical thinking, high-level information management and well-developed communication skills (<https://www.igi-global.com>).

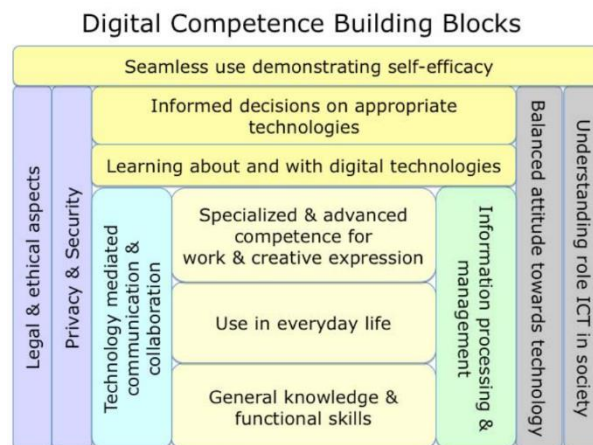
There are several definitions of digital competence in the literature. We highlight some of these, which basically provide a framework for operationalizing digital competence research in a specific area, such as a specific job or industry. However, it is important to say that the literature is not uniform in defining digital competence and digital literacy either. Not even within a narrower region, such as the Scandinavian countries (nordic), where studies by Godhe (2019) demonstrate the use of different terms and concepts in curricula on how to prepare students for digital life and digital work. Digital competence is consistently used only in Sweden, while in Denmark, for example, it is the IT and media.

Based on the Digital Competence Framework for Citizens (DigComp) developed by the European Commission, the areas of digital competence are: information and data management, communication and collaboration, digital content, security, and problem solving. These areas can be broken down into competences, which also include skill levels and practical examples (Carretero et al., 2017).

Ferrari et alii (2012) divided the definition of digital competence into blocks: learning domains, tools, competence areas, fashion, and purposes. In their study, they also examined 15 frameworks, based on which they also defined competence areas such as information management, collaboration, communication and sharing, creation of content and knowledge, ethics and responsibility, evaluation and problem-solving, and technical operations.

Janssen et al. al. (2013) also divided digital competence into blocks, but not based on an analysis of a given literature and / or existing definitions but using the Delphi method to summarize the opinion of 95 experts, as shown in Figure 1. In addition to everyday use, the blocks also include special use and technology compliance. Skill levels vary between and within blocks, and there are even overlaps but they can complement each other.

**Fig. 1: Digital Competence Building Blocks**



Source: Janssen et. al. (2013 p. 478)

Curtarelli et al. (2016) divide digital capabilities into three major areas based on what members of society use it for. Basic digital literacy skills. These skills can be applied both to the workforce and to people in the knowledge society in general. Digital skills which relate to employment. Basic skills are complemented by skills expected in the workplace, which are already related to ICT. Digital skills for ICT professions, which includes both previous skills and these skills are needed in the ICT sector.

Iloäki (2011) emphasizes that digital competence encompasses a number of abilities and competences and extends to areas such as media and communication, technology and computing, literacy, and information sciences.

The concepts of digital competence and digital literacy are also often used in public discourse. The use of the definition is ambiguous today. Several have tried to interpret the context in which interpretations appear in higher education research, so they refer primarily to technical skills or social practices (Spante et al, 2018). Some researchers have examined the digital competence of Italian and Spanish university students. They found that graduates had upper-level or intermediate competences in information and digital literacy, as well as communication and collaboration, but showed lower skills in creating digital content (López-Meneses et al, 2020). Some studies have aimed to examine the link between digital skills and employment and emphasize the importance of policy interventions to improve digital literacy. It is important for governments and employers to develop a new strategy to promote digital literacy not only for professionals but for the entire workforce (Bajakoivic at al, 2020). Information and communication technology also significantly determines the development of companies and countries. Government has a key role to play in enhancing the role of digital competence. There is a clear positive correlation between unemployment and the level of digital literacy in the EU Member States. Underdeveloped, developing, and developed countries differed not only in the number of digitally educated people but also in the distribution of digitally educated groups (Csordás, 2020). The challenges of digital development and its sectoral effects in the EU Member States were also examined. The services sector was particularly dominant. And the statistical survey of developing countries did not confirm the assumption that industry is the main factor of economic growth. The presence of information communication technology is important and at the same time, the need for online training is increasing (Csordás, 2020).

Understanding strategic decisions to address regional economic issues is of growing interest today among academics and policy makers. Furthermore, studies that propose effective strategies to address social and political concerns about the digital future are timely. Adaptive strategic planning can help regulate the effects of internal and external factors that shape individual and organizational responses to digital transformation. These factors promote and support regional competitiveness (Alamab et al, 2018).

## **2 DESI index**

The DESI index was created by the European Union in order to analyze and learn about the digital development of the Member States (informatics, infocommunications). The index consists of five dimensions, which, although logically related, also provide an opportunity for researchers to examine digital phenomena and activities affecting society separately and in connection with each other. The five dimensions are as follows: The first is network connectivity, which includes fixed and mobile broadband coverage, availability, and miscellaneous means. Human capital shows the ratio of internet users to IT professionals and informs these users about the development of digital competence. The use of internet services, including digital communications, summarizes the extent and dimensions of the use of electronic transactions. The integration of digital technologies affects the digitization opportunities of businesses and e-commerce. Finally, digital public services show the digitalization dimensions of the government, public administration, and health care.

The DESI index is published annually in the form of reports. DESI 2020 is based on 2019 data and assesses the state of the digital economy and society before a pandemic. It can already be seen that COVID has a significant impact not only on social processes and dimensions but also on the elements of the digital economy: for example, many key social internet services. Notwithstanding, most of these have not yet been significantly affected by the 2019 statistics. The Commission's reports show that, due to the outbreak and spread of Covid, Member States have taken immediate action to minimize infection and support the healthcare system, such as developing applications and platforms to facilitate telemedicine and support healthcare. According to the latest document published by the EU Commission (Digital Economy and Society Index 2020 - Country Reporting), based on the DESI index, the countries of the V4 show the following levels of development.

### **Poland**

Poland is the twenty-third out of the 28 EU Member States in the DESI index, although the Polish value has risen in line with the EU average. The country continues to use the largest mobile broadband service, for which it has very competitive prices. However, the integration of digital technology and the use of internet services are very low. 15% of people do not yet use online space and nearly 50% do not have basic digital skills either. 60% of companies are at a very low level in terms of digitization, while only 11% are digitally advanced. In 2019, the Polish state launched the IT Talent Development Program for 2019-2029, which aimed, among

other things, to reduce labor shortages in the IT sector by focusing on the field of human resources. In the country, people use the internet primarily to read the news, but a very high proportion also buy (66%) and bank (59%) on the interfaces offered by the World Wide Web. Companies are increasingly turning to the online space in their operations and taking advantage of the opportunities there. 13% of SMEs sell online domestically, 7% use cloud-based services, and 14% use social media. In terms of digital public services, the country is well below the EU average. There is a low level of online contact between the authority and the public, and a similar situation regarding the availability of business e-government services.

### Slovakia

Slovakia was twenty-second out of 28 EU countries. Indicators improved due to, among other things, improvements in network connectivity, internet services, and digital public services. In 2019 the Slovak government adopted a new strategy for the digital transformation of Slovakia by 2030.

For the first years, one of the main objectives of the strategy was the digital transformation of schools to support the development of artificial intelligence. The utilization of total fixed broadband services in the country is only slightly below the EU average (72% of households are affected). In terms of human capital, 27% of Slovaks feel that they have basic digital skills, the highest proportion in the four Visegrád countries.

In terms of internet use, the country is below the EU average. Those who have never used the internet are still 12% of the population, although the proportion of those who use the internet for some service has increased. For example, 66% of users use banking services, and interest in online shopping is stable.

For companies, the country's national digitization strategy supports the integration of innovation technologies. The country with improving numbers in many respects ranks twenty-sixth among the countries in the field of digital public services.

### The Czech Republic

The Czech Republic ranks 17th in the rankings according to the 2020 DESI results. It has shown improvement in three areas: human resources, integration of digital technologies, and internet use. These results are also due in part to the Covid situation, which has strengthened the integration of digital technologies. The Czech authorities have introduced a new national strategy in the field of artificial intelligence. Furthermore, from 2019, the law will ensure that the population can access almost all public services electronically. In terms of accession, the

Czech Republic is the twenty-fourth of the 28 member states. The new national broadband plan is expected to introduce measures to accelerate infrastructure development. In terms of human capital, 62% of the population has at least basic knowledge and 26% have knowledge beyond the basic skills. The number of people working in the IT sector increased by 4.1%. Most work in Prague. The proportion of those who never use the Internet fell to 9%. The number of online purchases is also in the Czech Republic. In the case of companies selling in this trade, more than 50% of their turnover already comes from such a source. There have also been advances in digital public services, for example, in the field of e-health.

### Hungary

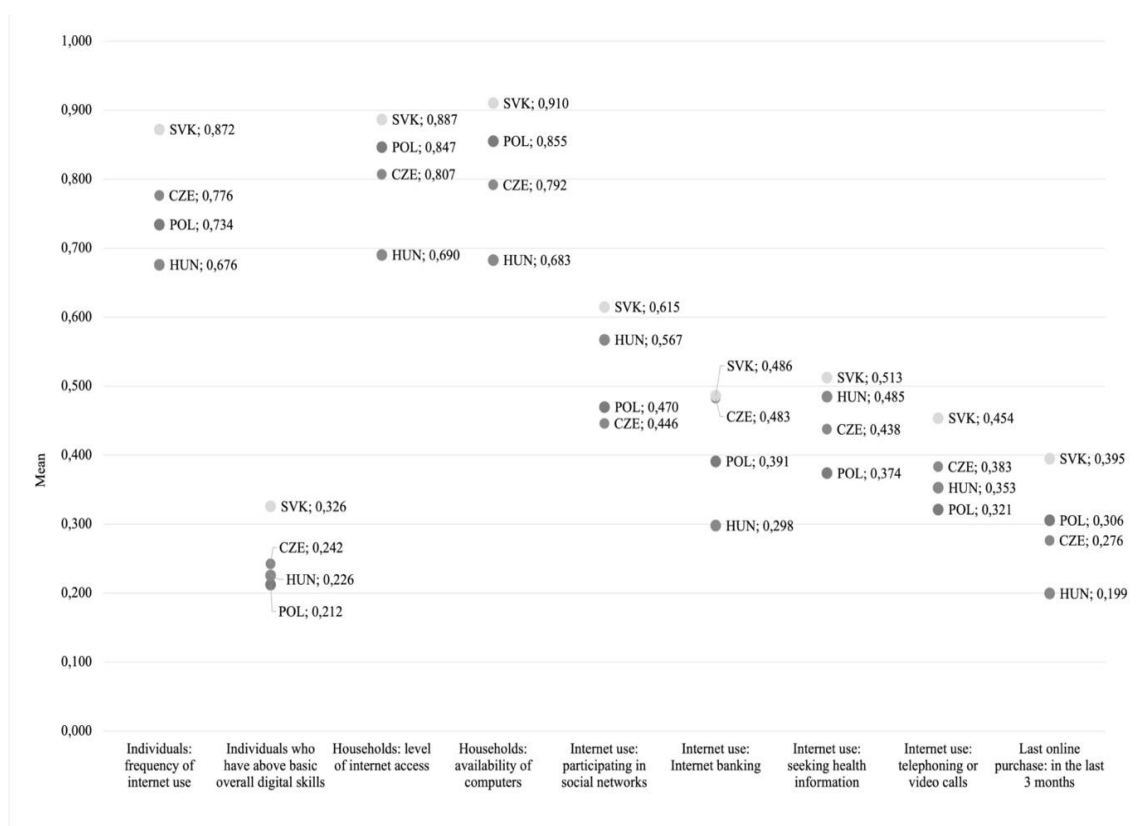
Hungary was 21st based on the 2020 index. The country occupies a prominent position in the field of broadband connections. It is a leader in broadband networks of at least 100 Mbps and 5G. Household broadband coverage is 90%, which is above the EU average (86%). In the area of human resources, basic digital skills are well below the EU average (49%, compared to the EU average of 58%). In 2016, the digital education strategy was launched, covering all public education, vocational training, higher education, and lifelong learning. The goal of the 2018 Digital Workforce Program is, among other things, to create a digital competence framework, to expand e-learning and blended learning opportunities, or to create various training programs, etc. 80% of the Hungarian population appears on the internet at least once a week, where they use social networks, read news, and make video calls. The country remains one of the worst in the EU in terms of digital technology integration for businesses. Since 2019 the country's municipalities have provided online services on a single platform. For example, the electronic services of the police are improving by providing e-payment in the form of pre-filled online forms.

## **3 Digitization as Reflected in the Statistics**

The authors of the article examined the dimensions and sub-dimensions that could be related to the everyday practical use of digital competence on the basis of DESI statistics and individual internet use statistics published by Eurostat for the V4 countries. The following is a list of these variables. Perhaps the most important, but definitely the first to mention is Internet access because it is no longer possible to carry out meaningful digital activities without it. In the case of an available network, the frequency and purpose of internet use depends only on the individual. Among these, dimensions were included in the variables, which include common

everyday activities: use of social media, frequency of internet banking in the last 3 months, shopping on the internet, and searching for health information (the latter one is particularly topical due to the current COVID situation). These statistics were available for the four countries for the period 2010-2019. The data describe the 16-74 age group and are per capita data for the sake of eliminating the distorting effect of the country and for uniform examination. For each variable, the researchers examined 10 years, so there were 40 item numbers as variables for four countries. In cases where the study was omitted in a given year, the value was replaced by the authors with the average value.

**Fig. 2: Digital competence in the V4 countries**



Source: Authors' own elaboration

The figure shows the performance of adult residents in the four countries. The first four columns show internet access and usage skills. The most striking is the clear leadership of Slovakia in all areas. At least seventy percent of households now have Internet access and similar frequency of use. However, in no country is this frequency of use associated with an adequate level of knowledge, as only 15-30% of respondents have knowledge above the EU average. The purpose of use is most often to appear on a social network, followed by banking, surfing, and shopping.



Due to the frequent use of social media, online phone calls or video calls are relatively rare, but this may also be since a continuous video connection of acceptable quality requires more bandwidth compared to browsing and reading. The relatively low frequency of online purchases has presumably increased significantly due to the limitations caused by COVID.

In the following, the writers formed a main component as a variable from the 10-year data of the four countries, from the following variables: internet access, activity on social media, internet banking, internet shopping, internet health service, internet usage frequency. The authors examined whether any correlation could be drawn between these variables for the four countries. The results of the correlation study are summarized in each table:

**Tab. 1: Correlation of principal components (szig.:0.01)**

		Internet access	Social network	Internet banking	Frequency of internet use	Online purchasing	Health information
Internet access	Corr.	1	0.977**	0.965**	0.983**	0.961**	0.985**
	Sig.		0.000	0.000	0.000	0.000	0.000
Social network	Corr.	0.977**	1	0.978**	0.975**	0.993**	0.981**
	Sig.	0.000		0.000	0.000	0.000	0.000
Internet banking	Corr.	0.965**	0.978**	1	0.985**	0.992**	0.986**
	Sig.	0.000	0.000		0.000	0.000	0.000
Frequency of internet use	Corr.	0.983**	0.975**	0.985**	1	0.984**	0.985**
	Sig.	0.000	0.000	0.000		0.000	0.000
Online purchasing	Corr.	0.961**	0.993**	0.992**	0.984**	1	0.981**
	Sig.	0.000	0.000	0.000	0.000		0.000
Health information	Corr.	0.985**	0.981**	0.986**	0.985**	0.981**	1
	Sig.	0.000	0.000	0.000	0.000	0.000	

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' own elaboration

It is clear from the results that there is a strong correlation between the factors. Those who appear on the social media interface typically try to shop online and also search for health information online. The frequency of internet use implies that people will find their way around the online shopping space or the banking space, too. Those who use the internet for shopping

also typically bank online and are active players in social media. Thus, data show that in the V4 countries, individual internet activities are positively strongly correlated with each other, stimulated by each practical option, which helps make the online space as permeable as possible to people's daily lives.

## **Conclusion**

The present study examined the potential of digital competence and the digital space in the V4 countries. It is no longer a question today that digitization is a very important economic factor and has active role in our daily life. Although the V4 countries are currently in the last third in many respects in terms of digitization features, efforts are being made in all four countries to address the backlog. The indicators of the DESI index show improvement in many respects, but of course there is still a long way to go. Surveys also show that individual digital activities have a positive impact on each other, helping countries to make the most of the opportunities offered by the digital space.

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